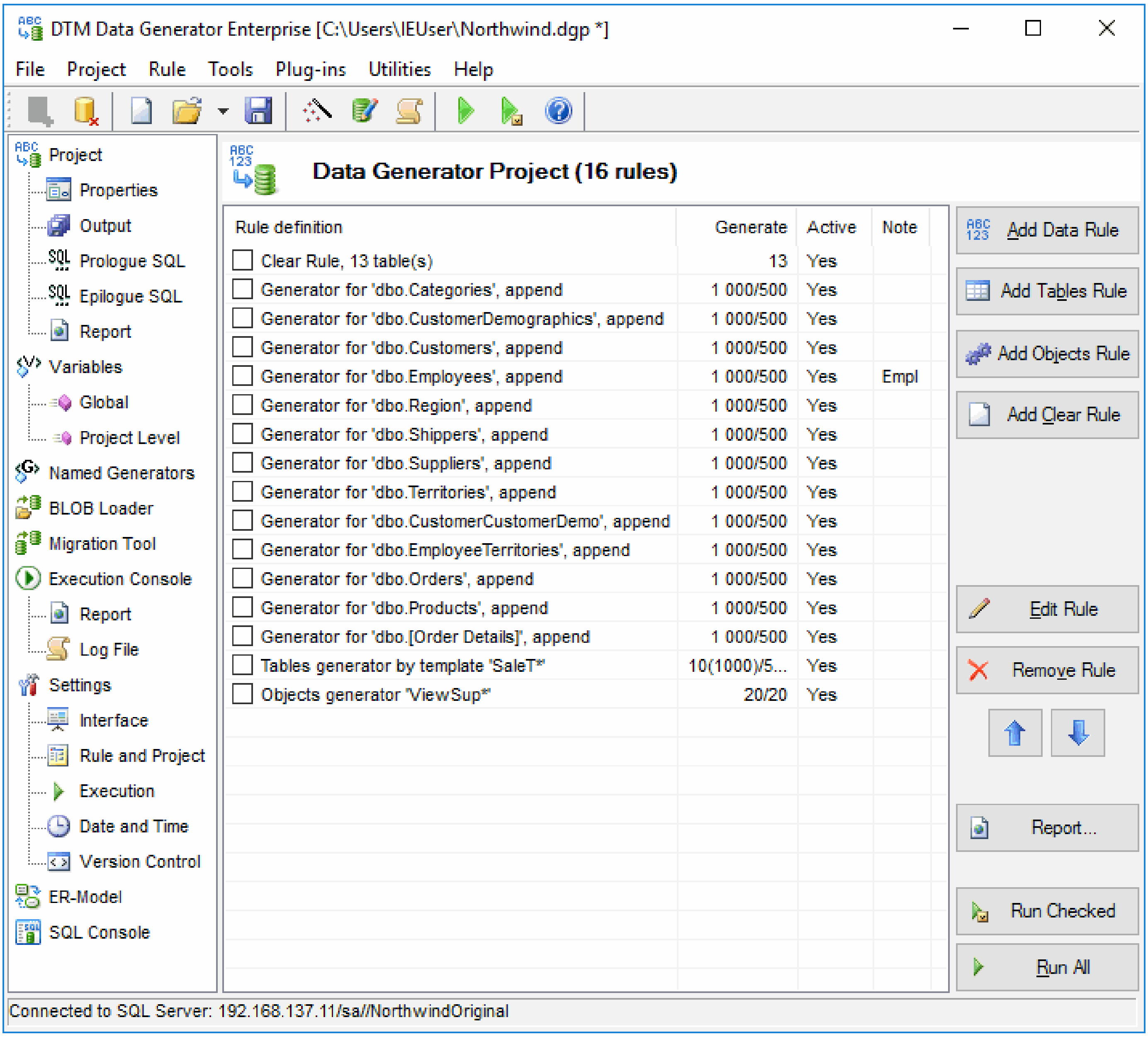
About the test data generator

DTM Data Generator is a simple, powerful and fully customizable tool that generates data rows and schema objects for database testing purposes.
The project is a set of generation rules. There are four principle generation rules: data rows generation (one rule correspond with one table but the user enabled to create a few rules for the same table), tables generation, objects generation and clear rule.

- The data rule inserts or appends the specified number of records into one table. This rule can also update existing data or scramble it to another database.
- The tables rule creates any number of tables with the same structure and with the names according to the template; the created tables can be populated by test data.
- The objects rule makes any number of database objects (views, procedures, etc) with the same definition (SQL statement) and with the names according to the template provided by user.
- Clear Rule helps users to remove existing data from the database table(s) before the generator execution.



DTM Data Generator Enterprise [C:\Users\IEUser\Northwind.dgp *]

Data Generator Project (16 rules)

Rule definition	Generate	Active	Note
□ Clear Rule, 13 table(s)	13	Yes	
□ Generator for 'dbo.Categories', append	1 000/500	Yes	
□ Generator for 'dbo.CustomerDemographics', append	1 000/500	Yes	
□ Generator for 'dbo.Customers', append	1 000/500	Yes	
□ Generator for 'dbo.Employees', append	1 000/500	Yes	Empl
□ Generator for 'dbo.Region', append	1 000/500	Yes	
□ Generator for 'dbo.Shippers', append	1 000/500	Yes	
□ Generator for 'dbo.Suppliers', append	1 000/500	Yes	
□ Generator for 'dbo.Territories', append	1 000/500	Yes	
□ Generator for 'dbo.CustomerCustomerDemo', append	1 000/500	Yes	
□ Generator for 'dbo.EmployeeTerritories', append	1 000/500	Yes	
□ Generator for 'dbo.Orders', append	1 000/500	Yes	
□ Generator for 'dbo.Products', append	1 000/500	Yes	
□ Generator for 'dbo.[Order Details]', append	1 000/500	Yes	
□ Tables generator by template 'SaleT*'	10(1000)/5...	Yes	
□ Objects generator 'ViewSup*'	20/20	Yes	

Connected to SQL Server: 192.168.137.11/sa//NorthwindOriginal

Note: '*' in the window title means the current project is not saved.

See also

- Product editions.
- Rules list context menu.

Product versions

There are three versions of the DTM Data Generator: Standard, Professional and Enterprise.

- Standard - this version is intended for individual users and small working groups.
- Professional - this version suits professionals and working groups that work with large-scale databases and need more functions for data generation control.
- Enterprise - this version suits corporate solution developers. It offers extended functionality, flexibility, and scalability.

With professional and enterprise version you can use runtime license.

Please refer the following table to explore differences between the product versions:

Option	Standard	Professional	Enterprise / Runtime
Maximum rules per project	128	Unlimited	Unlimited
Maximum data rows per one rule	10 000 000	2 100 000 000	about 9 200 000 000 000 000 000
Variables support	No	**Yes**	**Yes**
Variables export and import features	No	**Yes**	**Yes**
XML as output data format	No	**Yes**	**Yes**
JSON as output data format	No	**Yes**	**Yes**
Export, import and apply named generators features	No	**Yes**	**Yes**
Console mode	No	**Yes**	**Yes**
SQL Library integration	No	**Yes**	**Yes**
"From list" fill method, maximum values	1024	Unlimited	Unlimited
"From file" fill method, maximum values	4096	Unlimited	Unlimited
Scramble mode support	No	No	**Yes**
"Database Object" creation rule	No	No	**Yes**
Code is optimized for multiprocessor configurations [1]	No	No	**Yes**
64-bit version [2]	No	No	**Yes**
Included DTM Masking Tool license	No	No	**Yes**
Included DTM Value Library Manager license	No	No	**Yes**
Silent mode	No	No	**Yes**
Included single license of DTM Data Editor [3]	No	No	**Yes** [4]

[1] - the program recognizes and use configurations with 1, 2 or 4 processors automatically.

[2] - allows users to utilize more than 2 Gb RAM at 64 bit systems.

[3] - allows the user to review or edit populated database by one click as well as to modify Value Library directly.

[4] - you save US$ 129.

Step-by-step quick start: operation selection

I want to:

- Append test data to my table
- Replace table's content by test data
- Update data in my table by test values
- Scramble my table data
- Populate my database by test values

Fill methods (also known as predefined data generators):

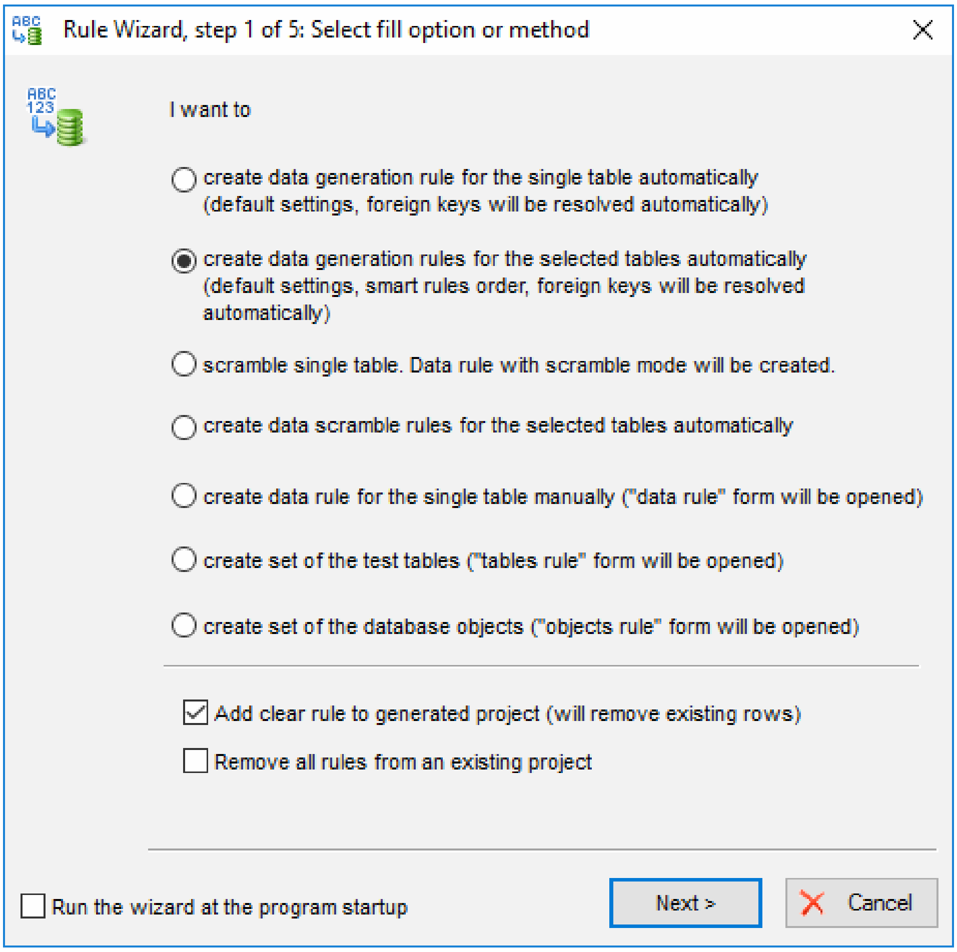
1. Random values
2. From the list
3. From database table.
4. From the file (CSV/TSV,etc).
5. With incremental values
6. Value Library
7. Values according to the data generation pattern
8. By SQL statement execution
9. By regular expression
10. Group item

Welcome screen and Rule Wizard

The Rule Wizard helps you to switch to one of the most useful product features and prepare ready-to-use project by a few clicks only. It allows you to:

- Create a data generation rule for the single table automatically. The program will create a data rule with default settings, foreign keys will be resolved automatically
- Create a data generation rules for the selected tables automatically. The program will create a set of rules with default settings. It will determine best order of the rules in the project and foreign keys will be resolved automatically
- Create a data scramble rule for a single table
- Create a set of data scramble rules for a specified tables
- Create a data rule for a single table manually. "Data rule" form will be opened
- Create a set of the test tables. "Tables rule" form will be opened
- Create a set of the database objects. "Objects rule" form will be opened
- Add optional clear rule to the project generated by wizard
- Remove all rules from the current project

Also, it offers test data by example function. If you already have some data in the database (the same or another one) the wizard analyzes them for best rules creation: patterns, value ranges, etc.



Rule Wizard, step 1 of 5: Select fill option or method

I want to

○ create data generation rule for the single table automatically (default settings, foreign keys will be resolved automatically)

● create data generation rules for the selected tables automatically (default settings, smart rules order, foreign keys will be resolved automatically)

○ scramble single table. Data rule with scramble mode will be created.

○ create data scramble rules for the selected tables automatically

○ create data rule for the single table manually ("data rule" form will be opened)

○ create set of the test tables ("tables rule" form will be opened)

○ create set of the database objects ("objects rule" form will be opened)

☑ Add clear rule to generated project (will remove existing rows)

□ Remove all rules from an existing project

□ Run the wizard at the program startup

See also: tables selection page.

System Requirements

DTM Data Generator is a Windows application, known to be compatible with the following operating systems: Windows XP, Windows 2003 and newer Server family and Windows Vista, 7, 8/10 (desktop). The 64-bit edition is also available.

DTM Data Generator x64 edition is compatible with Windows 2003, 2008 and 2012 Server x64 Edition as well as with Vista x64, Windows 7 x64 and Windows 8/10 x64 (desktop mode).

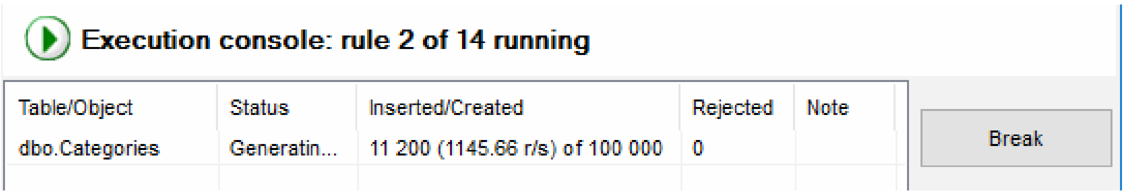
RAM: 64 MB.
Hard Disk: at least 10 MB of free space required for installation.
Display: 1024 x 768 or higher resolution, 32K colors.
Interfaces: ODBC, IDAPI, OLE DB, or Oracle Call Interface (OCI) required for database connection.

Note: the multiplatrorm runtime allows users to execute precreated projects under Linux/Unix and MacOS.

Execution Console

The execution console is a list of the executed items (rules) of the project. It allows you to view execution process and results of the project execution.

In the console, you can view one line for each performed rule. Besides the information about the table or some other object the operation of data creation was applied to, the operation status and the number of the inserted and rejected records are displayed in the window.



Execution console: rule 2 of 14 running

Table/Object	Status	Inserted/Created	Rejected	Note
dbo.Categories	Generatin...	11 200 (1145.66 r/s) of 100 000	0	

Notes

- The user can run whole project (all rules) as well as checkd rules only.
- The "Break" button allows the user to cancel current execution. Current and following rules will be stopped.
- There are a few settings those allow to tune execution console output.
- Please refer to the log file for detailed information about rejected rows and other errors.

See also: performance mode.

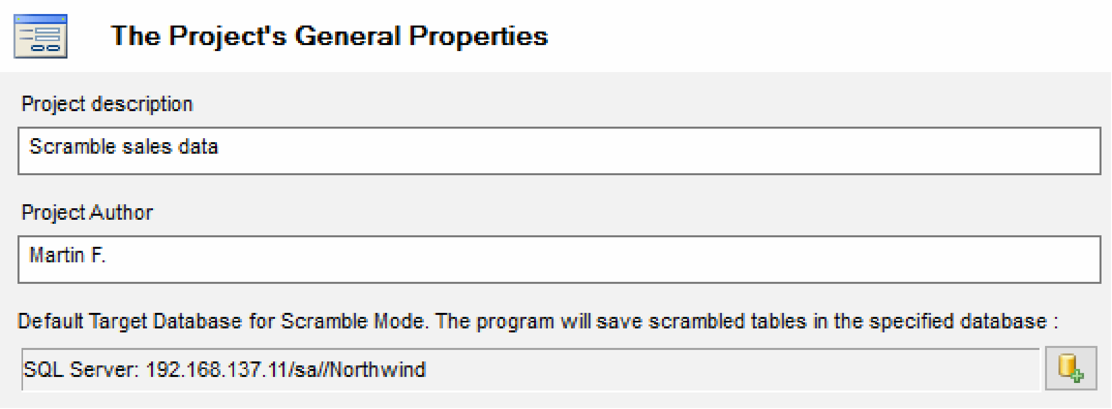
Project Properties

These forms allow the user to specify project properties. There are four blocks of properties:

1. General properties
2. Prologue SQL scripts
3. Epilogue SQL scripts
4. Project level output options

General Project Properties

This window allows users to specify general project properties.



The Project's General Properties

Project description: Scramble sales data

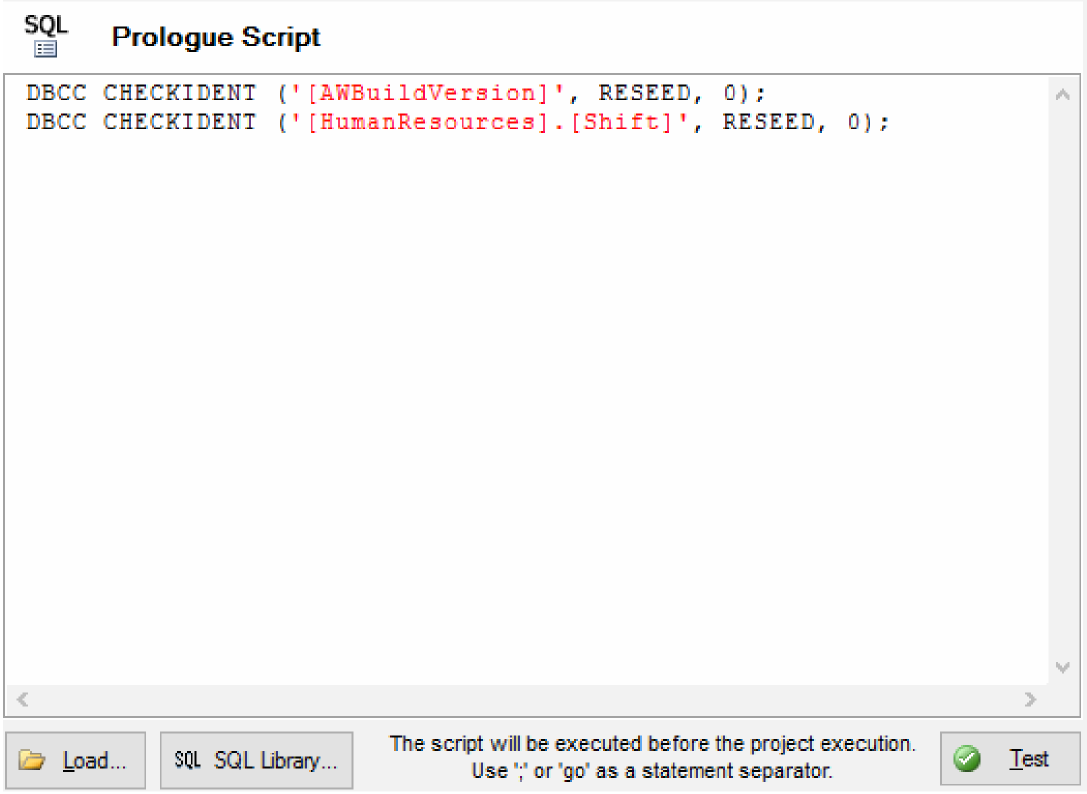
Project Author: Martin F.

Default Target Database for Scramble Mode. The program will save scrambled tables in the specified database : SQL Server: 192.168.137.11/sa//Northwind

The software does not use the description and author during data generation. The fields help teams to organize storage of the projects.

Project Properties

This window helps users to provide optional prologue and epilogue SQL scripts, i.e. scripts those will be executed before and after the project.



```
DBCC CHECKIDENT ('[AWBuildVersion]', RESEED, 0);
DBCC CHECKIDENT ('[HumanResources].[Shift]', RESEED, 0);
```

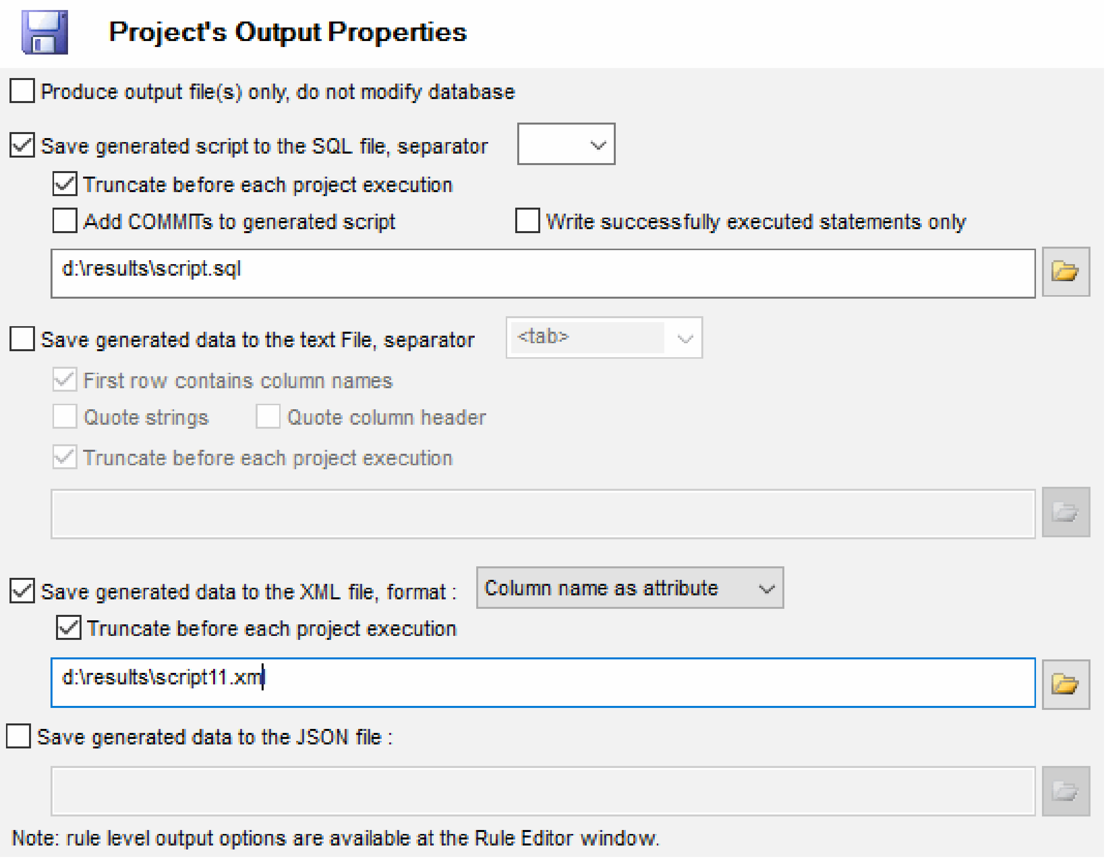
The script will be executed before the project execution.
Use ';' or 'go' as a statement separator.

See also: rule level scripts.

Project Output Options

This window allows the user to provide project level output options for SQL, text, XML and JSON formats. It is recommended to use the rule editor to define custom output options for each data generation rule.

The user allowed entering $DATE$ or $TIME$ macros as a part of output file name. The variable can be used as well for this purpose. The program removes ':' and '/' from date and time value automatically.



Project's Output Properties

☐ Produce output file(s) only, do not modify database

☑ Save generated script to the SQL file, separator

☑ Truncate before each project execution

☐ Add COMMITs to generated script

☐ Write successfully executed statements only

d:\results\script.sql

☐ Save generated data to the text File, separator <tab>

☑ First row contains column names

☐ Quote strings

☐ Quote column header

☑ Truncate before each project execution

☑ Save generated data to the XML file, format : Column name as attribute

☑ Truncate before each project execution

d:\results\script11.xml

☐ Save generated data to the JSON file :

Note: rule level output options are available at the Rule Editor window.

See also: rule level output options.

Database Connection

Quick Start: how to connect?

There are five ways to connect to a database:

1. Direct connection
2. Connection to desktop files
3. Data source with ODBC, IDAPI or Oracle Call Interface (OCI)
4. DSN File connection
5. OLE DB connection

In all modes the "Test" and "Information" buttons, as well as tools for working with connection profiles are available. "Test" button allows you to check information you entered and/or data source (or alias) configuration.

See also:

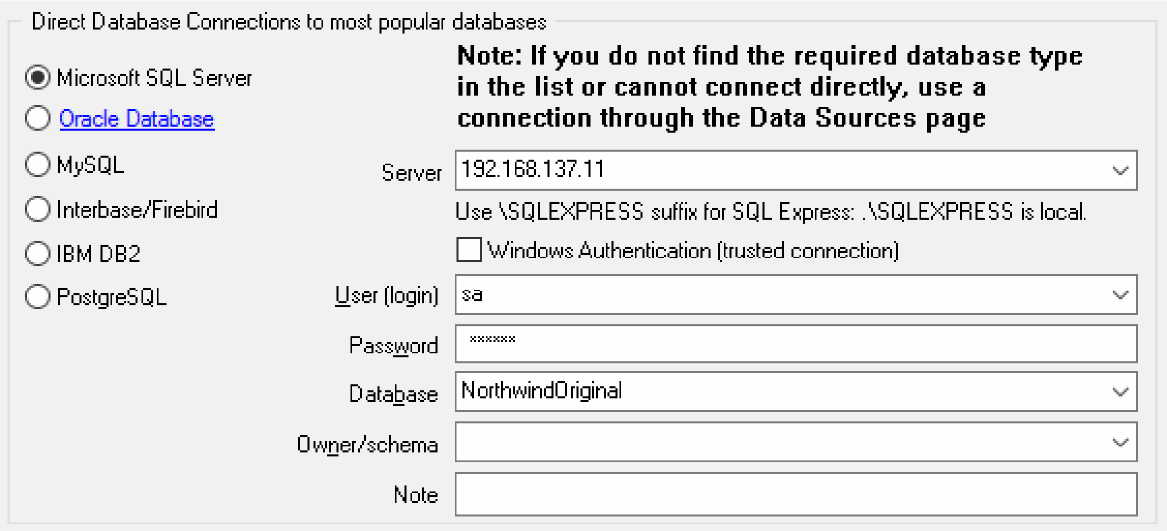
- Troubleshooting guide
- Connection information
- Connection profiles

Database	How to connect
MS SQL Server	Enter or select server name at the direct connection panel
Local SQL Server Express	Enter .\SQLEXPRESS as server name at the direct connection panel
Oracle	1) Switch to data sources mode 2) select OCI as "Interface" 3) select your service name from data source drop-down menu
DB2	Use direct connection panel or Use predefined ODBC DSN for custom connection settings
MySQL	**Install ODBC driver for MySQL from www.mysql.org** Use direct connection panel or Use predefined ODBC DSN for custom connection settings
PostgreSQL	Use direct connection panel or Use predefined ODBC DSN for custom connection settings
Interbase/Firebird	**Install ODBC driver** Use direct connection panel or Use predefined ODBC DSN for custom connection settings
Microsoft Access	1) Switch to "Desktop File" panel 2) Select "Access" as file type, enter or select file name
Microsoft Excel	1) Switch to "Desktop File" panel 2) Select "Excel" as file type, enter or select file name
Another database	1) Install ODBC driver for your database system 2) Create ODBC data source name using Windows ODBC Administrator 3) Switch to data sources mode 4) select your data source from drop down menu

Direct Database Connection

Direct Connection

The direct connection method allows you to connect to most popular databases (MS SQL Server, Oracle, Interbase/Firebird, MySQL, PostgreSQL and DB2).
Enter the server name and the database name, if required. The user name and password are optional. Their necessity depends on the settings of your database. The owner name (schema) is optional too. The list of visible database objects depends on the choice of the owner. If the owner is empty, you will access all objects. There is important that schema/owner name is case sensitive.
If you do not find the required database type in the list or cannot connect directly, use a connection through the predefined data source. If DBMS is in the list, but unavailable, it means that either the required ODBC driver is not installed or it is not configured properly.
During its use, the program stores the entered values of server names, users and owners. You can select a value from the stored list using the corresponding combo box. For some DBMS types (MS SQL, for example), the program can fill the list of available databases. Use the button with two arrows for this purpose.



Direct Database Connections to most popular databases

● Microsoft SQL Server
○ Oracle Database
○ MySQL
○ Interbase/Firebird
○ IBM DB2
○ PostgreSQL

Note: If you do not find the required database type in the list or cannot connect directly, use a connection through the Data Sources page

Server: 192.168.137.11

Use \SQLEXPRESS suffix for SQL Express: .\SQLEXPRESS is local.

□ Windows Authentication (trusted connection)

User (login): sa

Password: ******

Database: NorthwindOriginal

Owner/schema:

Note:

DBMS-specific connection options

Microsoft SQL Server

- "(local)", empty or "." server name means local server
- use <server name>\<instance name> syntax to identify instance. Example: .\SQLEXPRESS means SQL Express at the local system

Oracle

Use connect string for the Oracle Server that you want to access as a Server name.

Important: it is strongly recommended to use native Oracle Call Interface (OCI) instead of direct connection.

Interbase and Firebird

Examples:

- Server: **localhost** and Database **c:\interbase\myDb.fdb** - connect to specified DB on local system.
- Server: **172.17.2.10/3051** and Database **/usr/local/db/myDb.fdb** - connect to specified server with alternate port 3051 on remote system 172.17.2.10

MySQL

- Use **localhost** for local MySQL
- example.com;port=3306 means MySQL at example.com on 3306 port

DB2

ServerName;port=5000;protocol=TCPIP as a server name means connect to ServerName, use 5000 port and TCP/IP protocol.

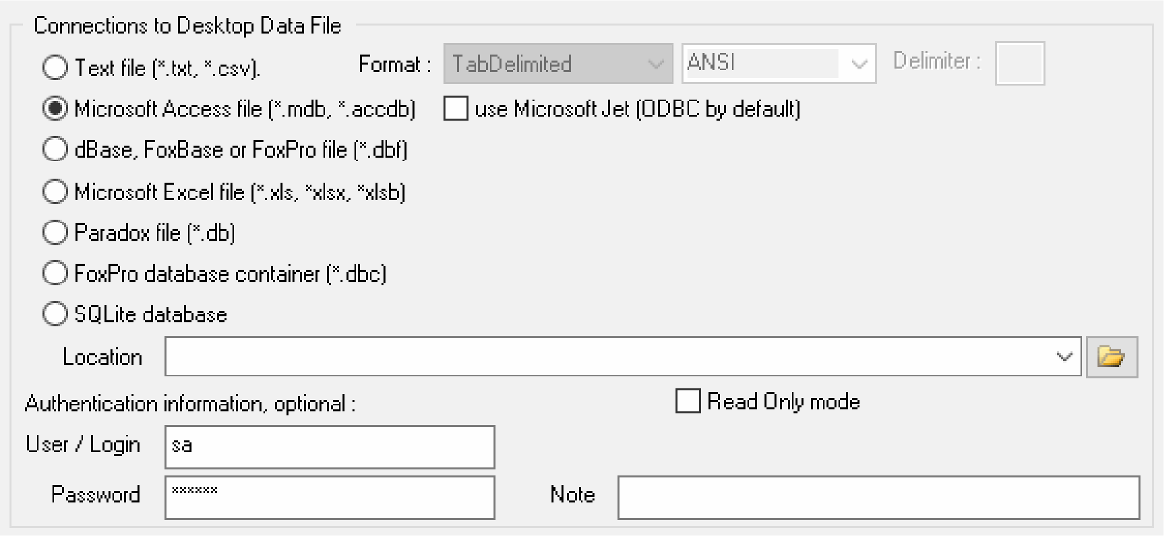
PostgreSQL

ServerName as a server name means connect to ServerName, use 5432 port and TCP/IP protocol. Database name is required. localhost as a server name is acceptable. To specify custom port you should add ";port=NNNN" string to server name.
server_name_or_ip-address;port=5432;DATABASE=dbname

Desktop File Connection

Desktop Files

The second way is designed for connecting to desktop data files. Select the required format and specify the file name or the directory where the data is located. Other parameters are optional.



Connections to Desktop Data File

○ Text file (*.txt, *.csv). Format : TabDelimited ANSI Delimiter :

● Microsoft Access file (*.mdb, *.accdb) □ use Microsoft Jet (ODBC by default)

○ dBase, FoxBase or FoxPro file (*.dbf)

○ Microsoft Excel file (*.xls, *xlsx, *xlsb)

○ Paradox file (*.db)

○ FoxPro database container (*.dbc)

○ SQLite database

Location

Authentication information, optional : □ Read Only mode

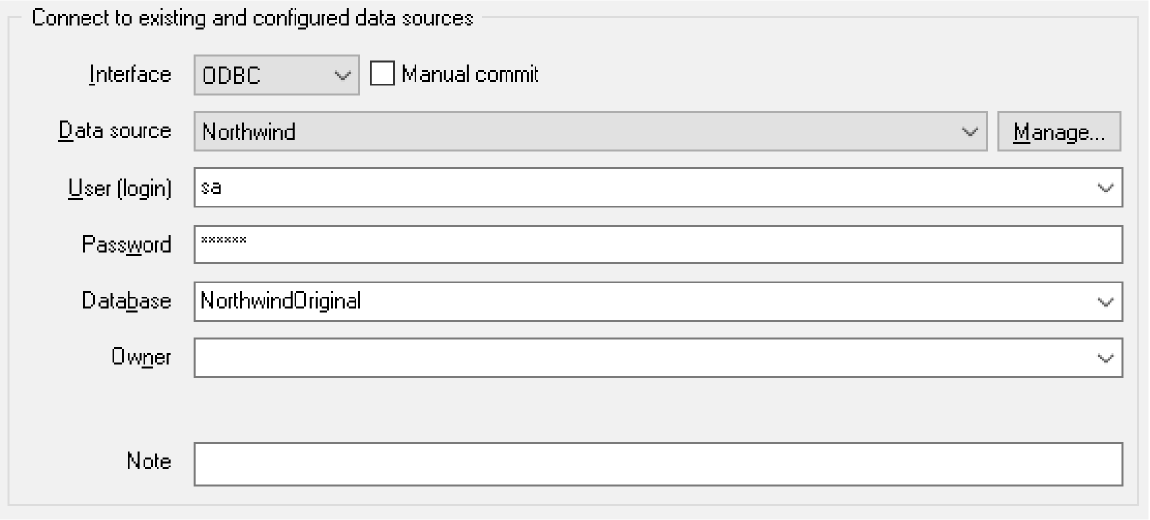
User / Login: sa

Password: ******

Note

Predefined data sources: ODBC, IDAPI, Oracle Call Interface

A connection with the use of a data source is the most universal. You can select ODBC, IDAPI or OCI (if installed) interface and the preconfigured data source name. In this case, other options are similar to those of a direct connection. The "Manage" button allows you to get access to the external configuration utility if it is available. When you want to access the tables belonging to the single database schema (or owner), you should fill the "owner" entry; otherwise, all tables will be accessed.



Connect to existing and configured data sources

Interface: ODBC ☐ Manual commit

Data source: Northwind

User (login): sa

Password: ******

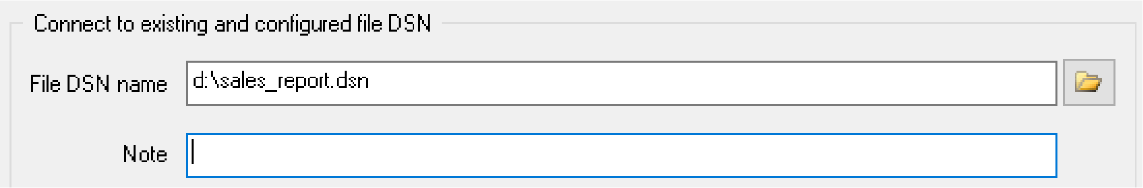
Database: NorthwindOriginal

Owner:

Note:

DSN File

The fourth way is using a DSN file. For this case, just select the file name with DSN definition.



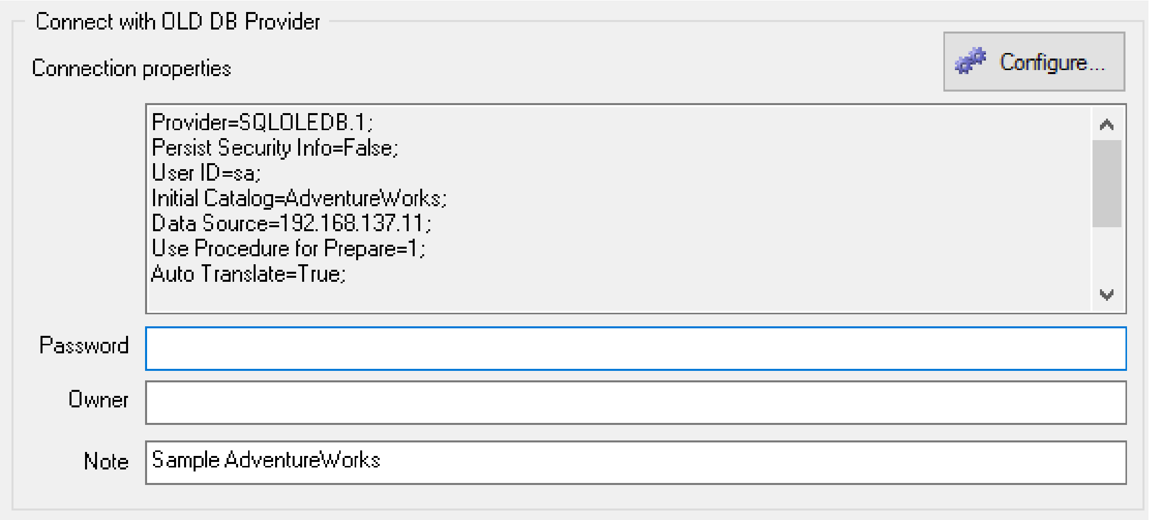
Connect to existing and configured file DSN

File DSN name: d:\sales_report.dsn

Note:

OLE DB connection

Use 'Configure' button to specify connection information. Password and owner fields are optional.



Connect with OLD DB Provider

Connection properties

```
Provider=SQLOLEDB.1;
Persist Security Info=False;
User ID=sa;
Initial Catalog=AdventureWorks;
Data Source=192.168.137.11;
Use Procedure for Prepare=1;
Auto Translate=True;
```

Password

Owner

Note: Sample AdventureWorks

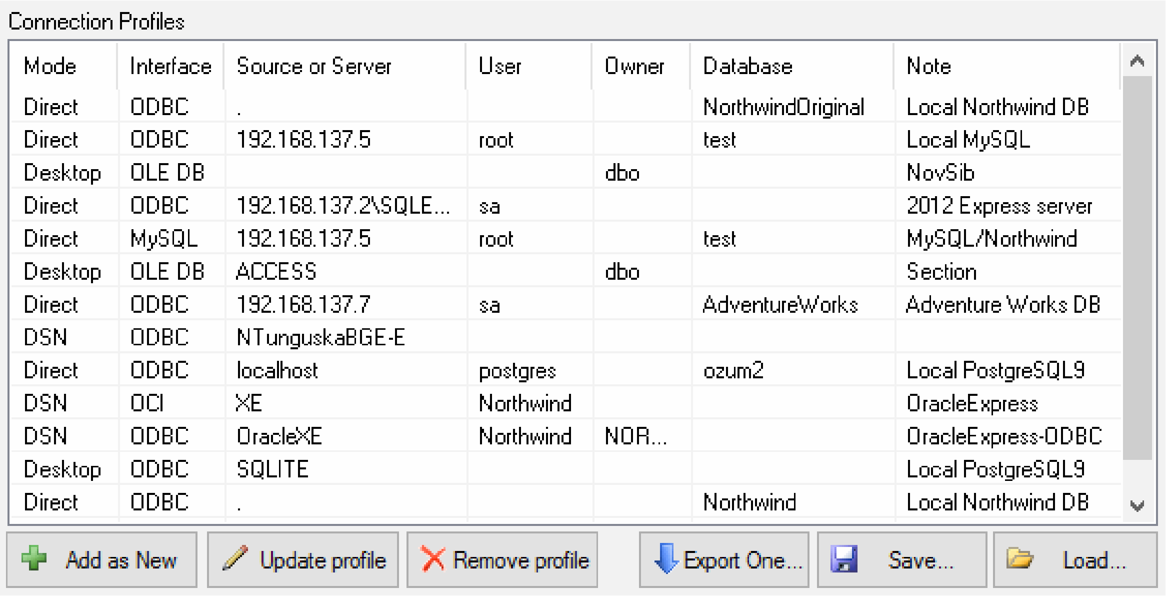
Connection Profiles

Connection profile helps you to save information about your connection (interface, data source or alias name, user name (login), password and database name, etc) and get access it by the one click.

Please fill connection properties and press "Add as new" to add a new profile. To modify the profile you should select it from the list at the top of the window, modify properties and press "Update". "Delete" button works when you select the profile to be deleted in the list.

"Save" and "Load" buttons allow you to save profiles to the disk file or load them. The "Export one" button helps to save single currently selected profile.

Important: all profiles are shared between all installed DTM soft products. That means once created profile can be used with any tool. At the other side if you remove the profile from the list you can't use it with DTM soft's products anymore.

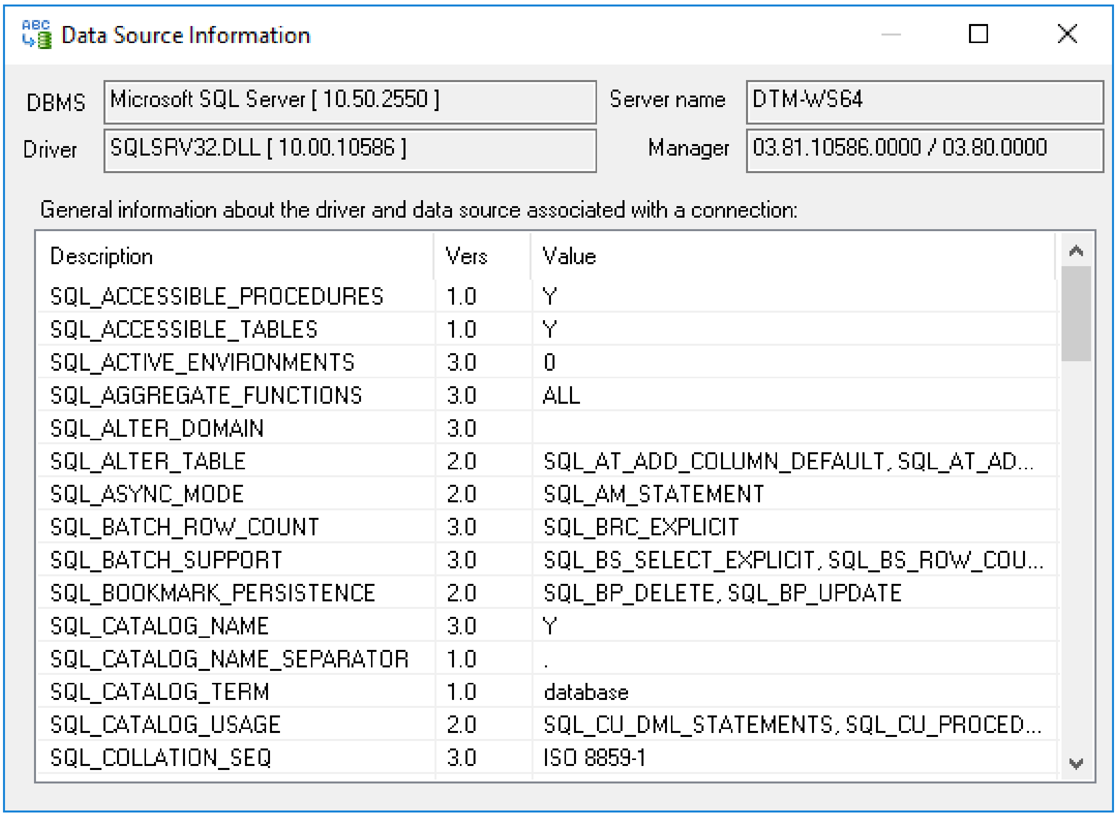


Connection Profiles

Mode	Interface	Source or Server	User	Owner	Database	Note
Direct	ODBC	.			NorthwindOriginal	Local Northwind DB
Direct	ODBC	192.168.137.5	root		test	Local MySQL
Desktop	OLE DB			dbo		NovSib
Direct	ODBC	192.168.137.2\SQLE...	sa			2012 Express server
Direct	MySQL	192.168.137.5	root		test	MySQL/Northwind
Desktop	OLE DB	ACCESS		dbo		Section
Direct	ODBC	192.168.137.7	sa		AdventureWorks	Adventure Works DB
DSN	ODBC	NTunguskaBGE-E				
Direct	ODBC	localhost	postgres		ozum2	Local PostgreSQL9
DSN	OCI	XE	Northwind			OracleExpress
DSN	ODBC	OracleXE	Northwind	NOR...		OracleExpress-ODBC
Desktop	ODBC	SQLITE				Local PostgreSQL9
Direct	ODBC	.			Northwind	Local Northwind DB

Connection Information

The program provides detailed database, connection and driver information and properties. The "Information" button at the connect window allows you to view it.



Data Source Information

DBMS: Microsoft SQL Server [10.50.2550]

Server name: DTM-WS64

Driver: SQLSRV32.DLL [10.00.10586]

Manager: 03.81.10586.0000 / 03.80.0000

General information about the driver and data source associated with a connection:

Description	Vers	Value
SQL_ACCESSIBLE_PROCEDURES	1.0	Y
SQL_ACCESSIBLE_TABLES	1.0	Y
SQL_ACTIVE_ENVIRONMENTS	3.0	0
SQL_AGGREGATE_FUNCTIONS	3.0	ALL
SQL_ALTER_DOMAIN	3.0	
SQL_ALTER_TABLE	2.0	SQL_AT_ADD_COLUMN_DEFAULT, SQL_AT_AD...
SQL_ASYNC_MODE	2.0	SQL_AM_STATEMENT
SQL_BATCH_ROW_COUNT	3.0	SQL_BRC_EXPLICIT
SQL_BATCH_SUPPORT	3.0	SQL_BS_SELECT_EXPLICIT, SQL_BS_ROW_COU...
SQL_BOOKMARK_PERSISTENCE	2.0	SQL_BP_DELETE, SQL_BP_UPDATE
SQL_CATALOG_NAME	3.0	Y
SQL_CATALOG_NAME_SEPARATOR	1.0	.
SQL_CATALOG_TERM	1.0	database
SQL_CATALOG_USAGE	2.0	SQL_CU_DML_STATEMENTS, SQL_CU_PROCED...
SQL_COLLATION_SEQ	3.0	ISO 8859-1

Troubleshooting Guide

Problem description	Possible reason	Solutions
Required database type not present in the list at Direct Connection and Desktop Connection pages		Switch to "data source" connection mode and select data source from the list or configure new one with "Manage" button.
Required format is in the direct connection list, but not available (disabled).	ODBC driver for your database does not installed or not configured properly.	Install required driver. If it is already present in the system, please contact our support staff.
Errors during direct connection.	Compatibility problems.	Try to create data source for your database connection.
Login error for correct user name and password.	Read-only desktop data file.	Try to change file mode to 'read and write'.
I can't see relationships, defaults, etc in my Access Database.	Access interface.	Try to switch on "Use Microsoft Jet" check box at the "Desktop File" page of the Connect Window.

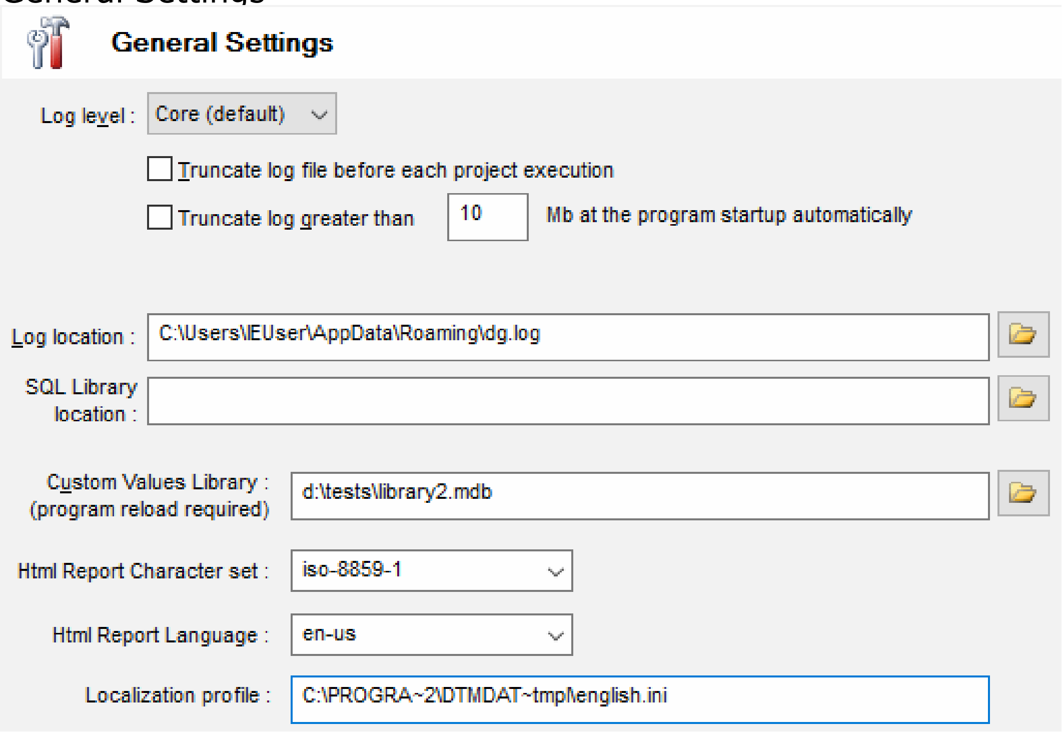
Product settings

The program has some settings and options aided to make your work more comfortable. There are five groups of settings:

1. General settings.
2. Interface options.
3. Rule and project settings.
4. Project execution options.
5. Date and time formats.

Option	Default	Description
Log level	Default	Product log level: core (default level), full log or disable logging.
Log truncation mode	Off	The program will clear log file before each project execution when this option is switched on.
Log truncation size	10	The program will clear log file when it exceeds specified size (Mb)
Log location	empty (product's directory)	Product log file location.
Custom value library		Location of the custom Value Library.
HTML encoding	iso-8859-1	The user have to change this option for non-Latin reports encoding.
HTML language	en-us	The user have to change this option for non-Latin reports encoding.

General Settings



General Settings

Log level : Core (default)

□ Truncate log file before each project execution

□ Truncate log greater than 10 Mb at the program startup automatically

Log location : C:\Users\IEUser\AppData\Roaming\dg.log

SQL Library location :

Custom Values Library : (program reload required) d:\tests\library2.mdb

Html Report Character set : iso-8859-1

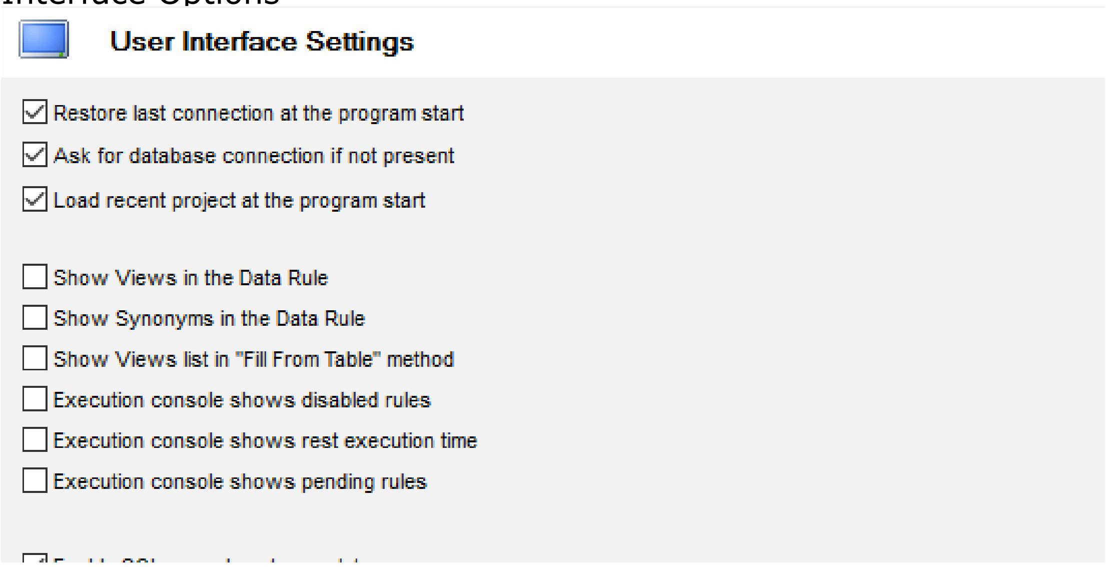
Html Report Language : en-us

Localization profile : C:\PROGRA~2\DTMDAT~tmp\english.ini

Interface settings

Option	Default	Description
Restore last connection	On	The indication that the program must reconnect to last connected database or data file.
Ask For Connection	On	Should the program open Connect Window when recent connection is not present or not available
Load recent project	On	The indication that the program must load the last opened project when it is started.
Show Views	Off	Should the program adds views to tables list in data rule editor
Show Synonyms	Off	Should the program adds synonyms to tables list in data rule editor
Show Views file "from table" method	Off	If this check box is turned on the user can link column to view. To a table only otherwise.
Execution console shows disabled rules	Off	If this mode is switched on, the execution console shows one line per rule. The enabled rules will be shown otherwise.
Execution console shows rest time	Off	If this check box is turned on the program will show estimated time to end of the current rule execution.
Rescan database schema on Rule Editor open	Off	If this option is switched on the software disables schema cache and reload list of tables and fields on each rule editor open.
Name input mode	Off	The program shows list of available objects in SQL console when this mode switched ON
Hotkeys are enabled	On	Switch this mode off to disable hotkeys like (Ctrl+S)
Ignore schemas	sys,system,INFORMATION_SCHEMA	The program skips objects in these schemas in all database operations

Interface Options



User Interface Settings

☑ Restore last connection at the program start

☑ Ask for database connection if not present

☑ Load recent project at the program start

☐ Show Views in the Data Rule

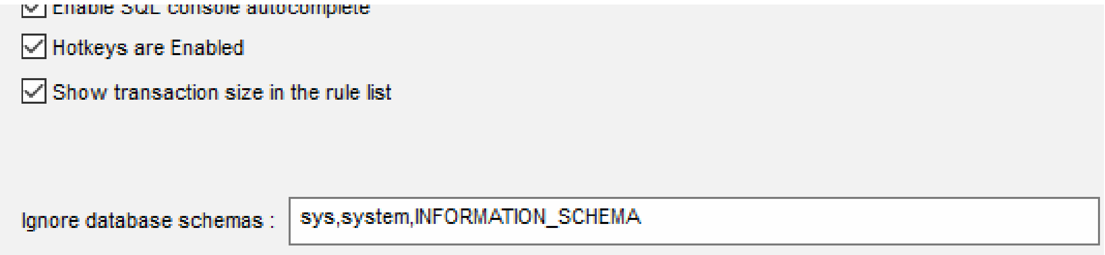
☐ Show Synonyms in the Data Rule

☐ Show Views list in "Fill From Table" method

☐ Execution console shows disabled rules

☐ Execution console shows rest execution time

☐ Execution console shows pending rules



☑ Enable SQL console autocomplete

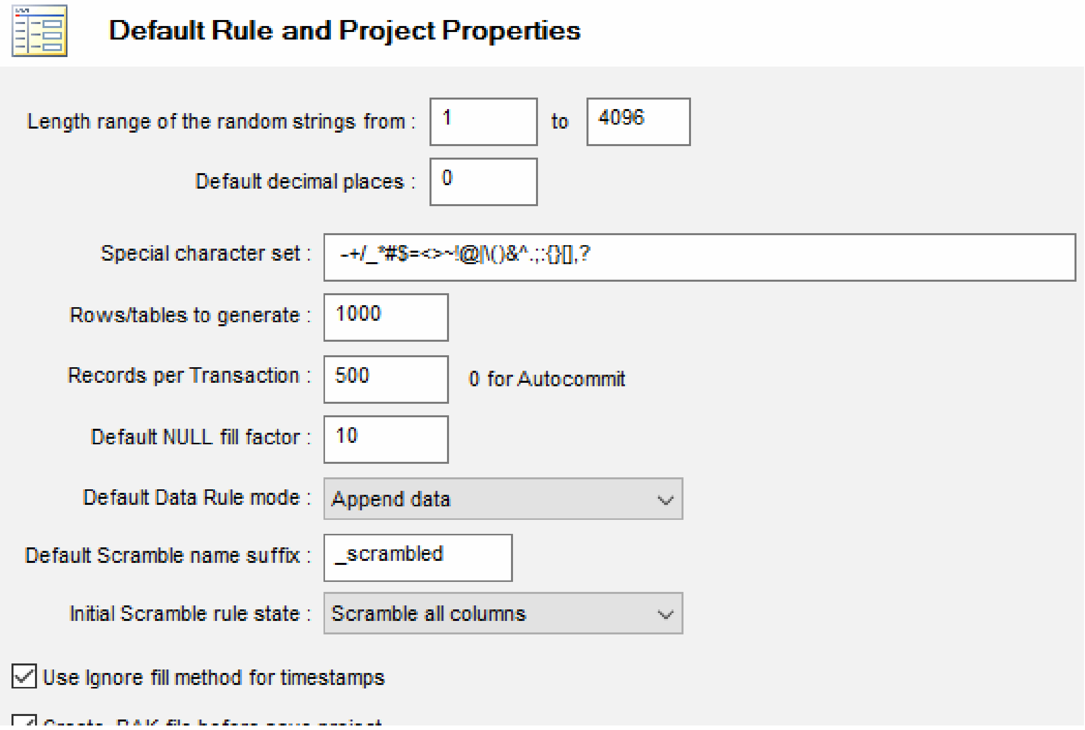
☑ Hotkeys are Enabled

☑ Show transaction size in the rule list

Ignore database schemas : sys,system,INFORMATION_SCHEMA

Option	Default	Description
Length range of random strings	0 to 4096	If possible, the program will generate random strings with length in the defined range.
Default decimal places	0	Number of decimal places in case the program could not detect it for database column.
Special Character Set	See screenshot	A set of additional symbols that be used to generate random strings if allowed by related rule property.
Default rows per rule	1000	The generator will create new rules with specified rows or objects counter.
Default transaction size	500	The number of rows or objects that will be entered or created per transaction. Use 0 for autocommit.
Default NULL fill factor	10%	This percentage of records from their entire number will have the Null value.
Default Data rule mode	Append	Default mode for data rule: append, replace, update or scramble. The generator will create new rules with this mode.
Scrambled table suffix	_scrambled	Target table generation method for scramble mode. The program will append specified string to the name of the source table to create a name of the target.
Initial Scramble rule state	Scramble all columns	The user should select the first case when he or she want to scramble most columns. The second choice suitable in case most columns must save original values.
Ignore timestamps	On	If this option is switched ON the program will generate data for "timestamp" data type depends on your database system. Ignore fill method will be applied otherwise.
Create .BAK file	On	The tool creates a backup copy of current project before save it.
Single CPU	Off for Enterprise On for other	Enterprise version of the program does not use multiprocessor optimization when this option is switched On.

Rule and Project Settings



Default Rule and Project Properties

Length range of the random strings from : 1 to 4096

Default decimal places : 0

Special character set : -+/_*#$=<>~!@|\()&^.;:{}[],?

Rows/tables to generate : 1000

Records per Transaction : 500 0 for Autocommit

Default NULL fill factor : 10

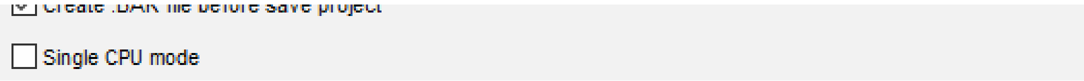
Default Data Rule mode : Append data

Default Scramble name suffix : _scrambled

Initial Scramble rule state : Scramble all columns

☑ Use Ignore fill method for timestamps

☑ Create .BAK file before save project



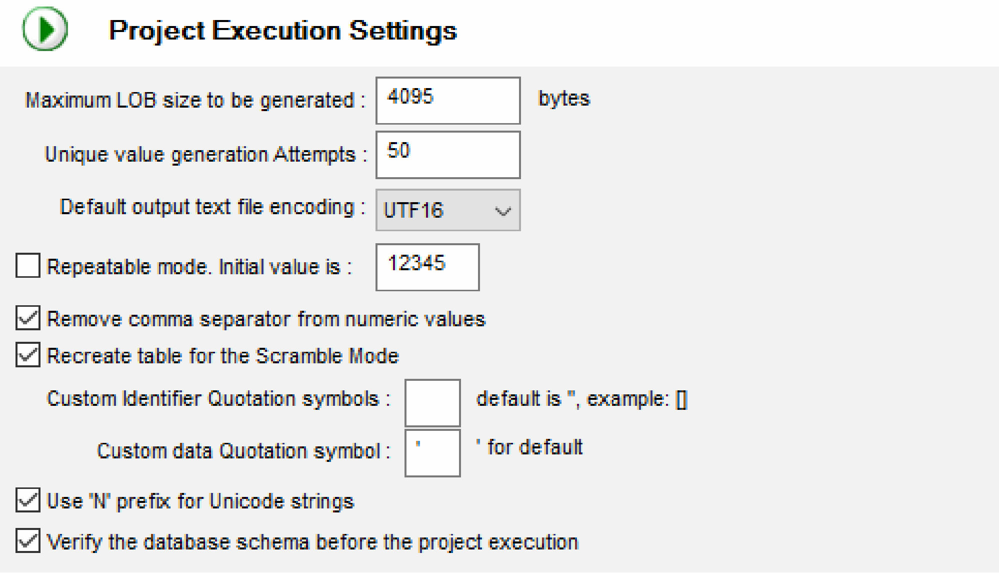
☑ Create .BAK file before save project

□ Single CPU mode

Project execution settings

Option	Default	Description
Maximum LOB size	4095	The program will not generate large objects longer this value.
Unique value generation attempts	50	The program stops generation process if could not generate a unique value after this number of attempts.
Repeatable mode	Off	The program generates same data for a few runs if this option is switched On and "initial value" is same.
Repeatable mode initial value	12345	The value that the program will use as a base for the repeatable mode.
Remove Comma Separator from numbers	On	This option is useful for external data sources those contain the numeric values with separators like 1,020.50 The program will import 1020.50 is this option is switched on.
Recreate table for scrambling		The program will drop and create target table between each scrambling execution. Use existing one otherwise.
Custom quote chars	On	The program will use this symbol (or symbols) to quote names. By default, it will use system symbols (SQL_IDENTIFIER_QUOTE_CHAR).
Use 'N' Unicode prefix	On	The generator will add N before Unicode strings when this mode is switched On. Example N'abc' instead of 'abc'
Verify database schema	On	The indication that the program must verify database schema before project execution.
Save project before execution	On	The generator saves current project to the disk file before the run if this option is switched On.
Single Transaction Mode	Off	The generator will execute the whole project as a single transaction. In any rule or statement fails project will be rolled back.
Performance mode is default	Off	The generator switches to performance mode with this settings. The program should be restarted.
Bulk Insert Mode	Off	The fast mode to load data to local Microsoft SQL Server. IMPORTANT: it is not compatible with another output modes. You should not use this mode together with "Save generated data to Text File" project option.

Project Execution Options



Project Execution Settings

Maximum LOB size to be generated : 4095 bytes

Unique value generation Attempts : 50

Default output text file encoding : UTF16

□ Repeatable mode. Initial value is : 12345

☑ Remove comma separator from numeric values

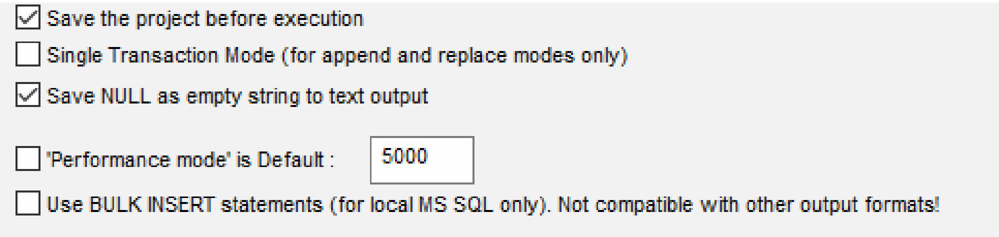
☑ Recreate table for the Scramble Mode

Custom Identifier Quotation symbols : default is ", example: []

Custom data Quotation symbol : ' ' for default

☑ Use 'N' prefix for Unicode strings

☑ Verify the database schema before the project execution



☑ Save the project before execution

□ Single Transaction Mode (for append and replace modes only)

☑ Save NULL as empty string to text output

□ 'Performance mode' is Default : 5000

□ Use BULK INSERT statements (for local MS SQL only). Not compatible with other output formats!

Date and Time Settings

Option	Default	Description
Date format	Depends on locale info	Date value format
Date/Time separator	Space	Symbol that will be inserted between date and time for "datetime" values
Time format	Depends on locale info	Time value format
Years range	1950 to 2020	Range of the acceptable years for random dates. This range will be applied to new rules only.
Conversion function for Date/Time		Database system specific function that should be applied to convert string to date value
Conversion function for Timestamps		Database system specific function that should be applied to convert string to time stamp value

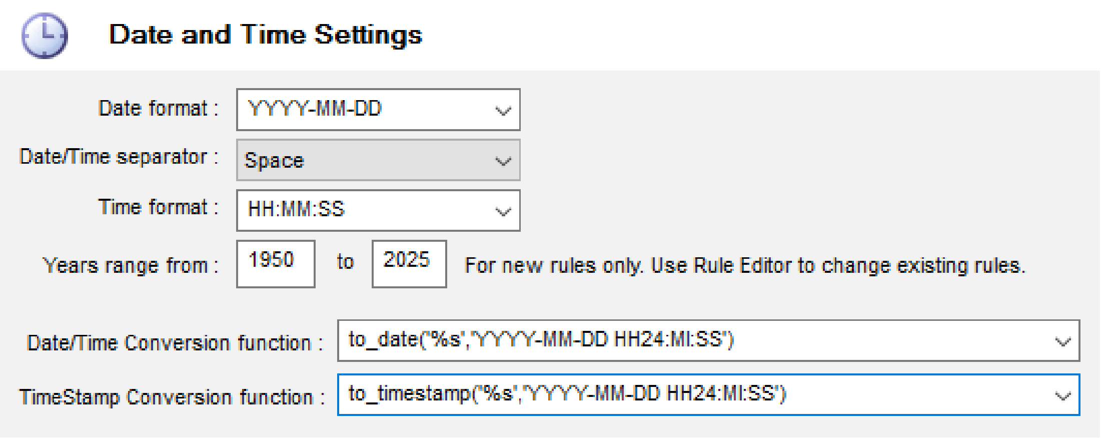
Date Format

The format string for date can contain following items:
DD - day, integer between 01 and 31
MM - month, integer between 01 and 12
MON - month, string between 'JAN' and 'DEC'
mon - month, string between 'jan' and 'dec'
YY - two-digits year, integer between 00 and 99.
YYYY - four-digits year, integer.
C - century, integer 0 to 8 value: 0 means 19xx, 1 means 20xx, etc. It is not compatible with YYYY.

Default date format depends on user's culture settings.

Time Format

The format string for time can contain following items:
HH - hour, integer between 00 and 23 (or 01 to 12).
MM - minute, integer between 00 and 59.
SS - second, integer between 00 and 59.
sss - milliseconds, integer between 000 and 999.
AM - AM or PM sign.
zz - time zone between -11:00 and +11:00.



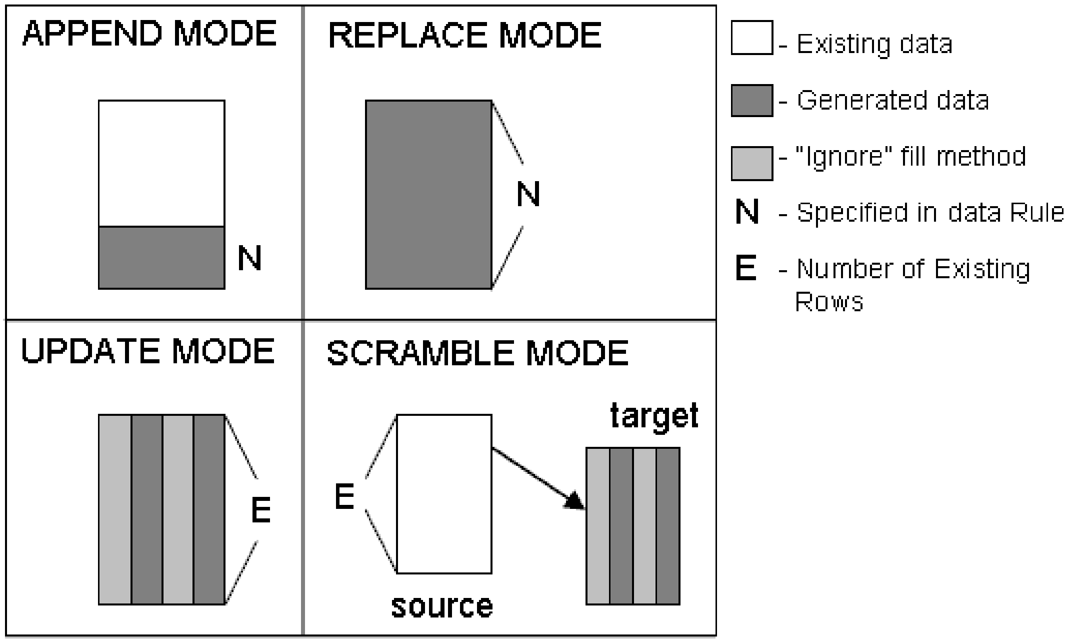
Date and Time Settings

Date format : YYYY-MM-DD
Date/Time separator : Space
Time format : HH:MM:SS
Years range from : 1950 to 2025 For new rules only. Use Rule Editor to change existing rules.
Date/Time Conversion function : to_date('%s','YYYY-MM-DD HH24:MI:SS')
TimeStamp Conversion function : to_timestamp('%s','YYYY-MM-DD HH24:MI:SS')

Table Fill Modes

By default ("**Append Data**" mode), the program will add new records to the selected table. There are three other modes:

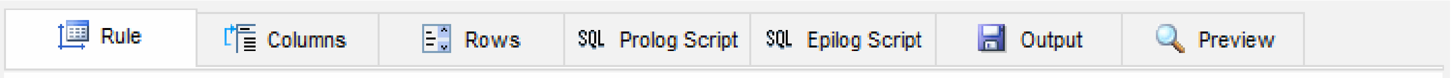
- In the "**Replace mode**", the program removes all data rows before adding new records. An alternative to this mode for a database with a complex set of relationships is using the Clear Rule.
- The third case called the "**Update Mode**" is the most complicated one. A table must have a Primary Key (PK) in order to use this mode. If the table has no PK, you must manually select a field for searching records to be updated (use the "Unique key" button near the mode drop-down menu to select a column). The program goes through records one by one taking into account the where clause specified for this mode and updates those fields whose fill mode is not Ignore.
- The "**Scramble**" mode (does not supported by Standard and Professional editions), also known as data making, uses two tables of the same or different databases. The program takes the contents of the first table (considering the value of the WHERE clause) and gets data rows from it sequentially. The values of columns for which Ignore fill method was used are placed in the target table as is. All other values are replaced with values generated according to the used fill methods. In this case, the requirements for the presence of Primary Key or its manual specification in the source table coincide with Update Mode. If the target table already exists, it will be deleted without warning; after that, the program will create a target table identical to the source table.



See also: Data Masking Tool.

Table Fill Options

Data Rule editor for single table contains seven tabs.



1. Tables definition. This tab contains information about source and target (for data scramble) tables.
2. Columns definition tab specifies the population method for each table's column.
3. Rows tab. It allows to specify how many rows will be generated by the rule.
4. Prologue script tab allows you to specify SQL script that will be executed before the data generation prcoess of the rule.
5. Epilogue script tab allows you to specify SQL script that will be executed after the rule.
6. Output tab. Along with the file with results script common for all rules (see Settings for details), the program allows you to create individual output files for each rule. Use this tab to specify the file names.
7. Preview sample data tab allows you to view sample data generated by the current rule.

See also: Table fill modes.

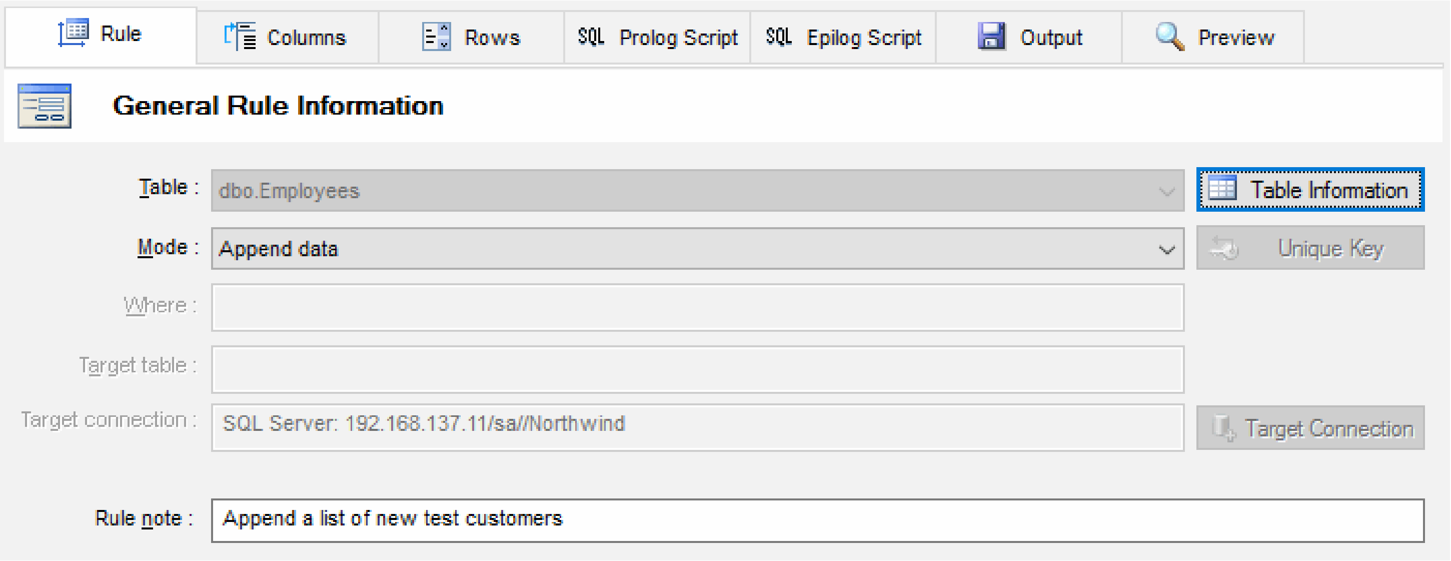
Rule Data, Tables options

This tab contains information about source and target (for data scramble) tables.

The "Where" field is used for Update Mode and Scramble Mode only. It can cut down the list of rows to be used when the rule is carried out. The field accepts depended on connected database "where" SQL clause without "where" keyword. By default, all data rows are processed for these modes.

The "Target" field is only used for Scramble Mode to specify the table where data rows will arrive after they are processed. Also, you can select target connection with the corresponding button. Please keep in mind that you can specify default connection for data scrambling at the project properties window. Please refer to "Default Target Database" option.

The Table Information button allows you to get additional information about the table: indexes, triggers, and check constraints. This information will help you to avoid conflicts and to create more efficient rules and projects.



General Rule Information

Table : dbo.Employees

Mode : Append data

Where :

Target table :

Target connection : SQL Server: 192.168.137.11/sa//Northwind

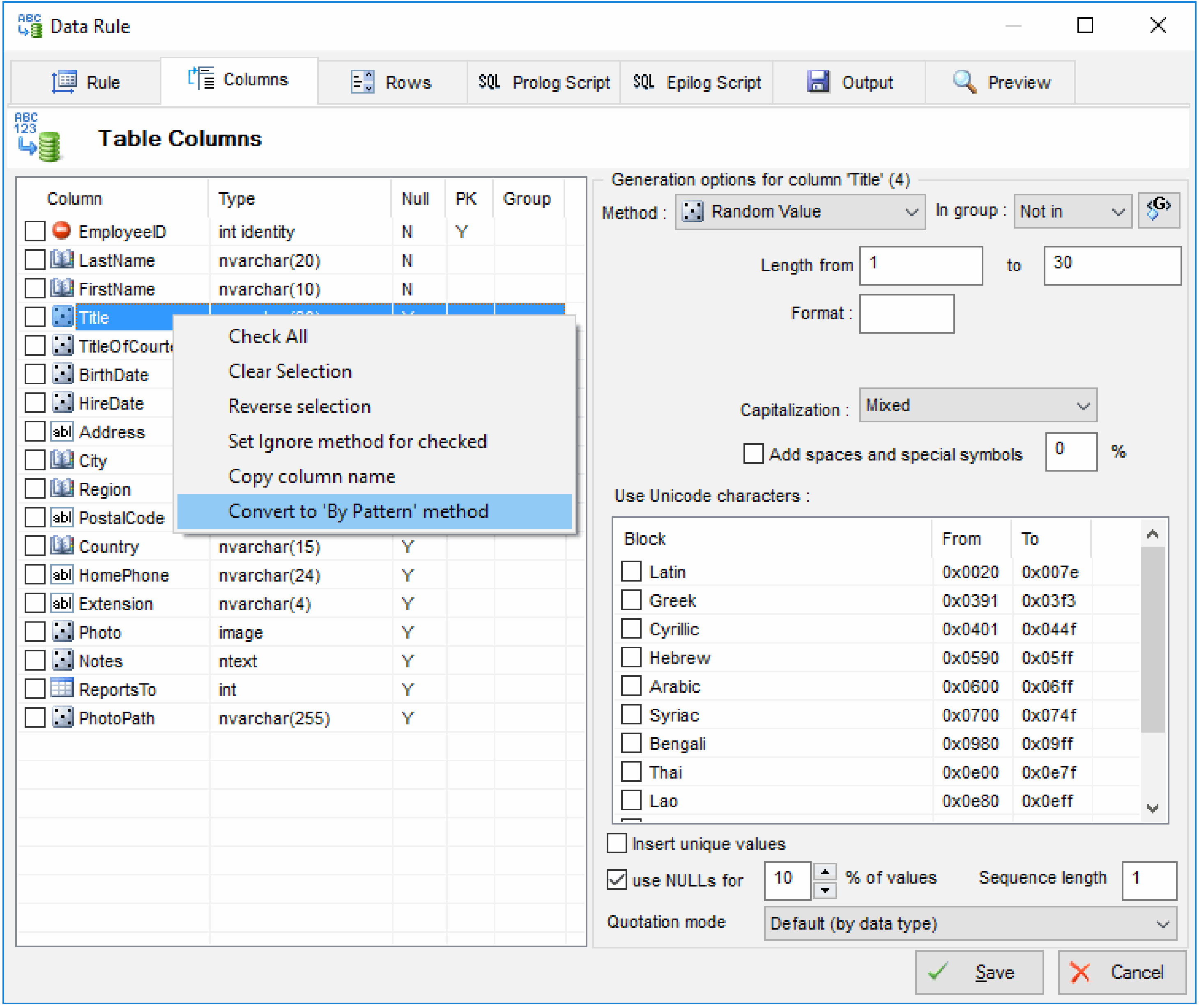
Rule note : Append a list of new test customers

The unique key button allows you to specify an alternate unique key for Update and Scramble Modes.

Also, you can define short text note for the rule at this tab. The program shows this note in the rule list.

Rule Data, Column generators

This tab helps the user to assign or review data generators for each column of the selected table.



Column	Type	Null	PK	Group
□ EmployeeID	int identity	N	Y	
□ LastName	nvarchar(20)	N		
□ FirstName	nvarchar(10)	N		
□ Title				
□ TitleOfCourt				
□ BirthDate				
□ HireDate				
□ Address				
□ City				
□ Region				
□ PostalCode				
□ Country	nvarchar(15)	Y		
□ HomePhone	nvarchar(24)	Y		
□ Extension	nvarchar(4)	Y		
□ Photo	image	Y		
□ Notes	ntext	Y		
□ ReportsTo	int	Y		
□ PhotoPath	nvarchar(255)	Y		

Generation options for column 'Title' (4)

Method : Random Value In group : Not in

Length from 1 to 30

Format :

Capitalization : Mixed

□ Add spaces and special symbols 0 %

Use Unicode characters :

Block	From	To
□ Latin	0x0020	0x007e
□ Greek	0x0391	0x03f3
□ Cyrillic	0x0401	0x044f
□ Hebrew	0x0590	0x05ff
□ Arabic	0x0600	0x06ff
□ Syriac	0x0700	0x074f
□ Bengali	0x0980	0x09ff
□ Thai	0x0e00	0x0e7f
□ Lao	0x0e80	0x0eff

□ Insert unique values

☑ use NULLs for 10 % of values Sequence length 1

Quotation mode Default (by data type)

The context menu of the column list allows users to:

- Select, clear or reverse selection of the fields.
- Set Ignore fill method for all selected fields. This option most useful for Update and Scramble modes.
- Convert fill method to "by pattern". The program will generate suitable engine call automatically.

If "Sequence length" (one by default) is greater than one the program will use each generated value a few times instead of generating new value for the new row.

There are three quotation modes:

- By default, the program uses column data type to identify quotation mode.
- No quote should be used in case the program hasn't required information: hex strings with 0x prefix, built-in database functions or other complex cases.
- Quote always. This mode suitable in case the program could not recognize database specific data type.

Note: the program tries to find a pattern or a Value Library item for some well-known field names automatically in order to make the data more realistic. Of course, you can edit automatically created generation rule in the "Data Rule Editor" window.

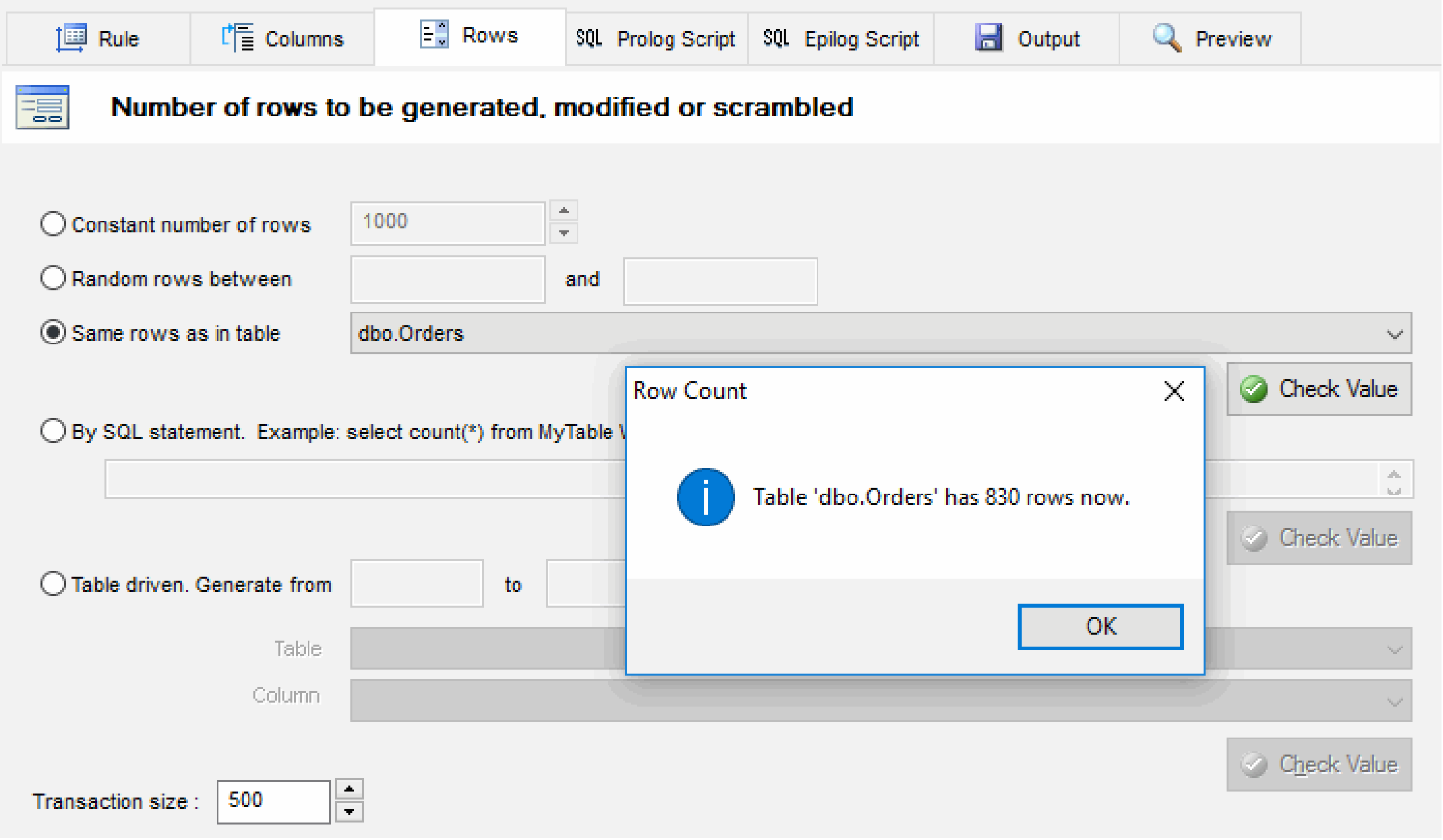
Row Count Management tab

The program supports a few ways to specify the number of rows to be generated. Please note that all methods are applicable to "append" and "replace" row modes only.
For "Update" and "Scramble" modes the program operates with the whole source table. Please use "where" clause at the table tab to limit rows to be updated or scrambled.

By default, the user provides **fixed values** and the program generates the exact number* of data rows if it is possible.
Also available:

- **Random** method. In this case, the program will generate a random number of rows in the range* specified by the user.
- By **another table** method. The generator will create the same number of rows as contained in another table of the same database.
- By **SQL statement**. This way allows the user o define SQL statement that will be executed before generation. The first result will be user as a number of rows.
- **By data** from another table. In this case, the program will generate defined number of rows for each unique value from specified 'table.column'.

* - the reference to the variable is acceptable as a constant number of rows as well as 'from' and 'to' borders of the range.



Number of rows to be generated, modified or scrambled

○ Constant number of rows 1000

○ Random rows between and

● Same rows as in table dbo.Orders

○ By SQL statement. Example: select count(*) from MyTable \

○ Table driven. Generate from to

Table

Column

Transaction size : 500

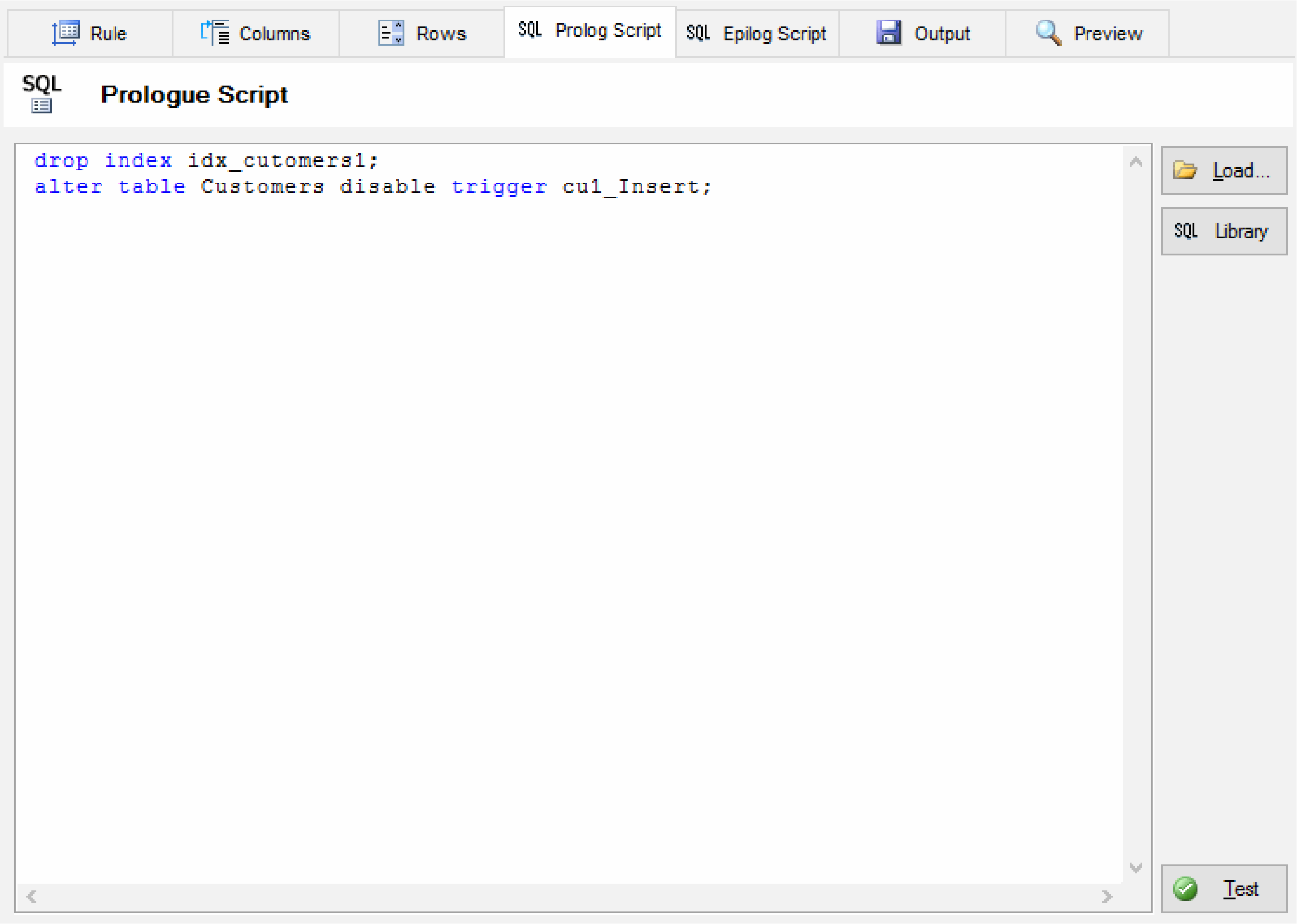
Row Count

Table 'dbo.Orders' has 830 rows now.

Prologue and Epilogue scripts

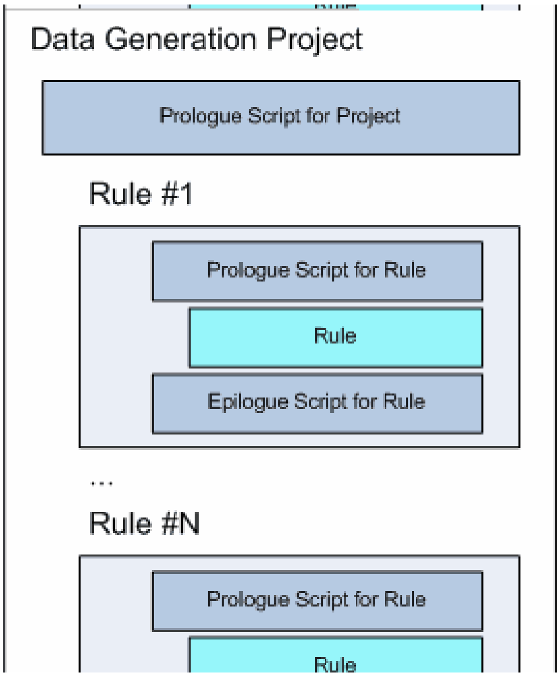
This window allows the user to specify prologue and epilogue SQL scripts for individual Data Rule.

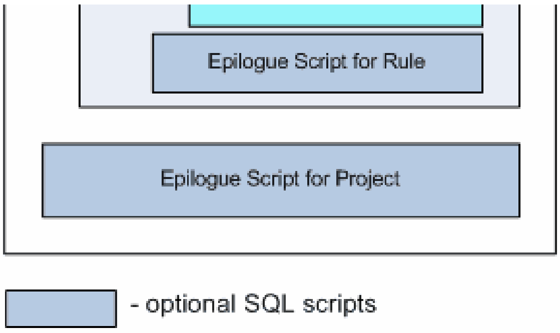
It's convenient to use these scripts to temporarily delete indexes, turn off triggers or check constraints. In some cases, this can make the process of data population much faster.



```
drop index idx_cutomers1;
alter table Customers disable trigger cu1_Insert;
```

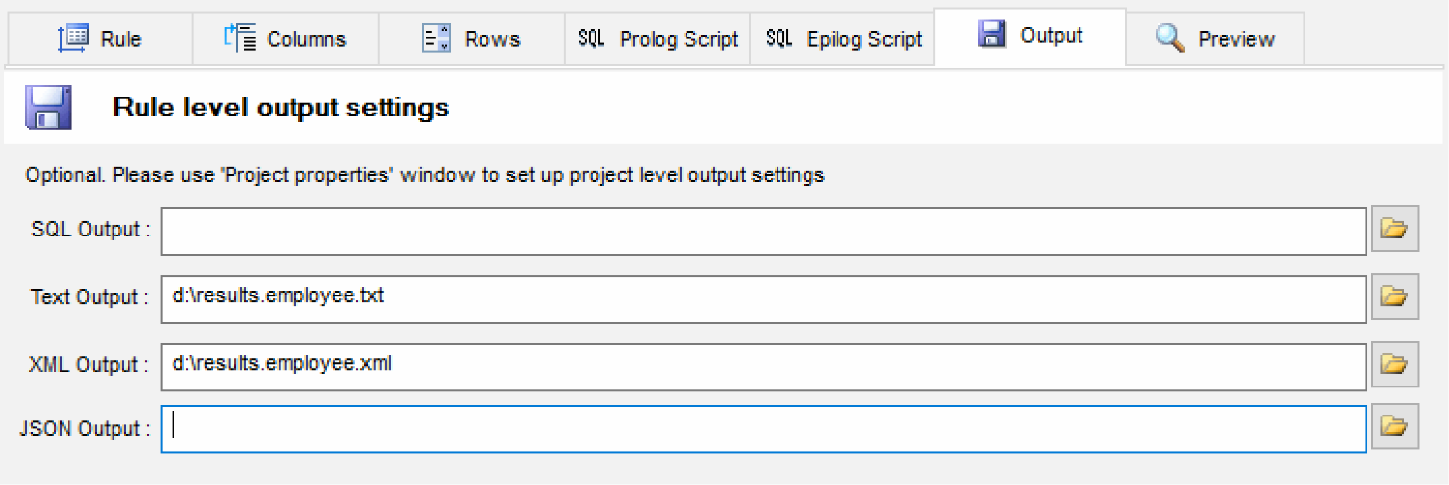
The following diagram shows script execution model for project and rule level prologue and epilogue:




Epilogue Script for Rule
Epilogue Script for Project
- optional SQL scripts

Rule output options

This tab helps you to specify local (rule level) file names for text, SQL, XML or JSON output. Please note that XML and JSON output options are not available in the standard version of the tool.



Rule level output settings

Optional. Please use 'Project properties' window to set up project level output settings

SQL Output :

Text Output : d:\results.employee.txt

XML Output : d:\results.employee.xml

JSON Output :

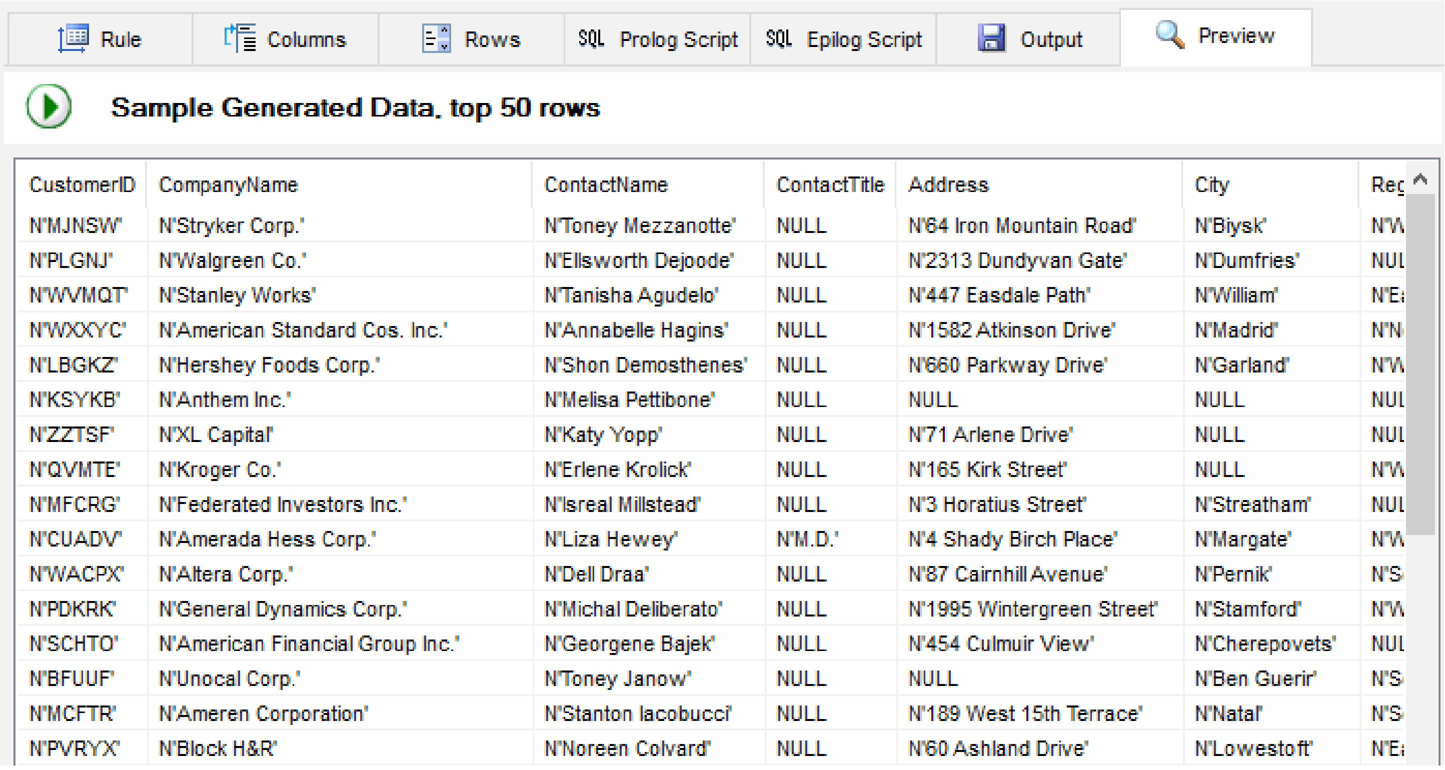
To specify global file options you should refer to project settings window.

The user allowed entering $DATE$ or $TIME$ macros as a part of output file name. The variable can be used as well for this purpose.

Note: the program removes ':' and '/' from date and time value automatically.

Preview sample generated data

This window allows you to view sample data generated by the current rule. You can view only a few top records. This list of values is approximate, actual data differ by their content, but they will have the same format and representation (size and type). The <ignored> value means that no value will be generated for this field because it will be inserted automatically.



Sample Generated Data, top 50 rows

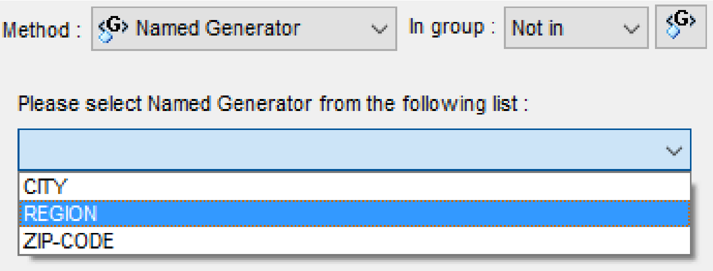
CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Reg
N'MJNSW'	N'Stryker Corp.'	N'Toney Mezzanotte'	NULL	N'64 Iron Mountain Road'	N'Biysk'	N'W
N'PLGNJ'	N'Walgreen Co.'	N'Ellsworth Dejoode'	NULL	N'2313 Dundyvan Gate'	N'Dumfries'	NUL
N'WVMQT'	N'Stanley Works'	N'Tanisha Agudelo'	NULL	N'447 Easdale Path'	N'William'	N'E
N'WXXYC'	N'American Standard Cos. Inc.'	N'Annabelle Hagins'	NULL	N'1582 Atkinson Drive'	N'Madrid'	N'N
N'LBGKZ'	N'Hershey Foods Corp.'	N'Shon Demosthenes'	NULL	N'660 Parkway Drive'	N'Garland'	N'W
N'KSYKB'	N'Anthem Inc.'	N'Melisa Pettibone'	NULL	NULL	NULL	NUL
N'ZZTSF'	N'XL Capital'	N'Katy Yopp'	NULL	N'71 Arlene Drive'	NULL	NUL
N'QVMTE'	N'Kroger Co.'	N'Erlene Krolick'	NULL	N'165 Kirk Street'	NULL	N'W
N'MFCRG'	N'Federated Investors Inc.'	N'Isreal Millstead'	NULL	N'3 Horatius Street'	N'Streatham'	NUL
N'CUADV'	N'Amerada Hess Corp.'	N'Liza Hewey'	N'M.D.'	N'4 Shady Birch Place'	N'Margate'	N'W
N'WACPX'	N'Altera Corp.'	N'Dell Draa'	NULL	N'87 Cairnhill Avenue'	N'Pernik'	N'S
N'PDKRK'	N'General Dynamics Corp.'	N'Michal Deliberato'	NULL	N'1995 Wintergreen Street'	N'Stamford'	N'W
N'SCHTO'	N'American Financial Group Inc.'	N'Georgene Bajek'	NULL	N'454 Culmuir View'	N'Cherepovets'	NUL
N'BFUUF'	N'Unocal Corp.'	N'Toney Janow'	NULL	NULL	N'Ben Guerir'	N'S
N'MCFTR'	N'Ameren Corporation'	N'Stanton Iacobucci'	NULL	N'189 West 15th Terrace'	N'Natal'	N'S
N'PVRYX'	N'Block H&R'	N'Noreen Colvard'	NULL	N'60 Ashland Drive'	N'Lowestoft'	N'E

Data Generation Methods

There are methods to fill in the fields:

1. with **random values**. More...
2. with the values **from the list** specified by the user. More...
3. with the values from the column of **another database table** specified by the user. More...
4. with the values **from the file** specified by the user (one value per line). More...
5. with the **incremental values** starting from the specified value. More...
6. with the values from the **Value Library**. More...
7. **ignore field** (uses for auto incremental fields such as identity or counter)
8. with random values according to the **pattern**. More...
9. with the result of the **SQL statement execution**. More...
10. with values according to the **regular expression**. More...
11. as a Group item. You can not set or change this fill method directly.
12. with the Excel spreadsheet. The method helps users get data from Excel spreadsheet.
13. with the XML document. The method helps users extract data from XML file for test data generation.
14. with the JSON document. The method allows users to provide JSON document as a source.
15. by the Script method runs a user-defined script (Python, Ruby, Perl, etc) to generate specific data sets.

Also, you can refer to Named Generator instead of the immediate specification of the data generation properties. You should select "Named Generator" from fill method drop down menu for this case.



Method : Named Generator

In group : Not in

Please select Named Generator from the following list :

CITY
REGION
ZIP-CODE

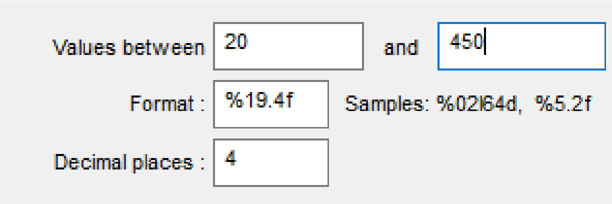
As to lists of values and lists in a file, the program allows you to use its special "use sequential values from the list" mode when data will be taken from the list not randomly, but sequentially in a loop.
Also, the program can interpret the value of the list as a pattern. The "Use list items as a pattern" checkbox can be used to enable this mode. This option supports for "list", list "from file", "Value Library" and "From Table" fill methods.

See also: field groups.

Random data generation method

There are settings for this data generation method:

- "From" is minimum value that will be generated for numeric (integer, float, etc) or date/time column.
- "to" is maximum value that will be generated for numeric or date/time column.
- "Length from" and "to" define length range for string values.
- Format defines the view of value. This option is applicable for numeric values only.
- "Decimal places" defines a number of decimal digits after the dot in the values. This option is applicable for numeric non-integer values only. For example, 2 for this option will produce values like 1.23, 55.70, 2.43, etc.

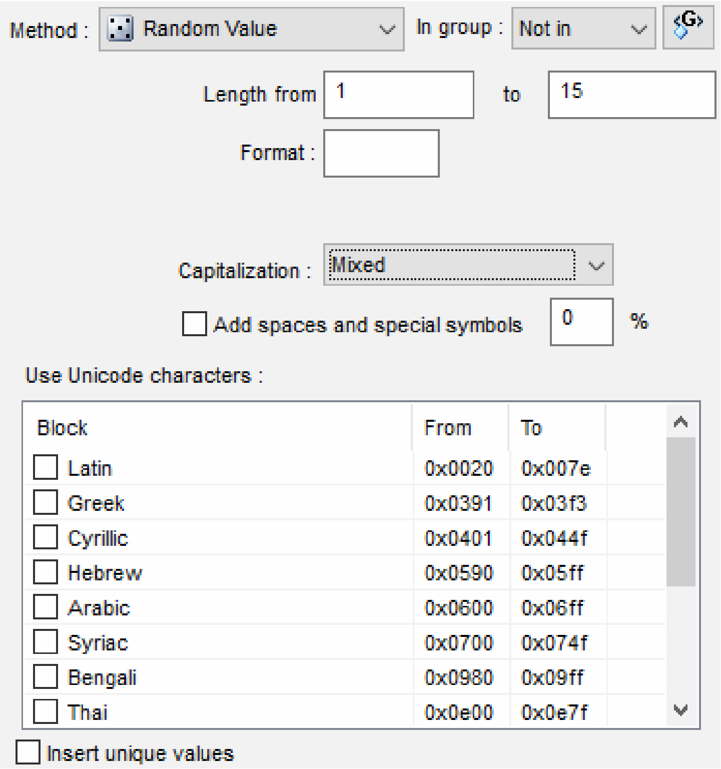


Values between 20 and 450

Format : %19.4f Samples: %02I64d, %5.2f

Decimal places : 4

For the "char" and "varchar" columns the user can specify extra settings: special characters usage or Unicode blocks (for Enterprise version only).



Method : Random Value In group : Not in

Length from 1 to 15

Format :

Capitalization : Mixed

□ Add spaces and special symbols 0 %

Use Unicode characters :

Block	From	To
□ Latin	0x0020	0x007e
□ Greek	0x0391	0x03f3
□ Cyrillic	0x0401	0x044f
□ Hebrew	0x0590	0x05ff
□ Arabic	0x0600	0x06ff
□ Syriac	0x0700	0x074f
□ Bengali	0x0980	0x09ff
□ Thai	0x0e00	0x0e7f

□ Insert unique values

Notes

- You can define year range for Date values using related settings.
- Default decimal places option helps you to change default (zero) value for this fill method property.
- You can use variables for "from" and "to" properties.
- You can define default length range for string columns using related options.
- You can change or define your own date and time format as well as date/time separator at the Settings window. The program tries to analyze acceptable format automatically when the Rule Wizard works.
- Custom Date Conversion function can be defined in the settings and will be applied to any date value before INSERT or UPDATE execution.

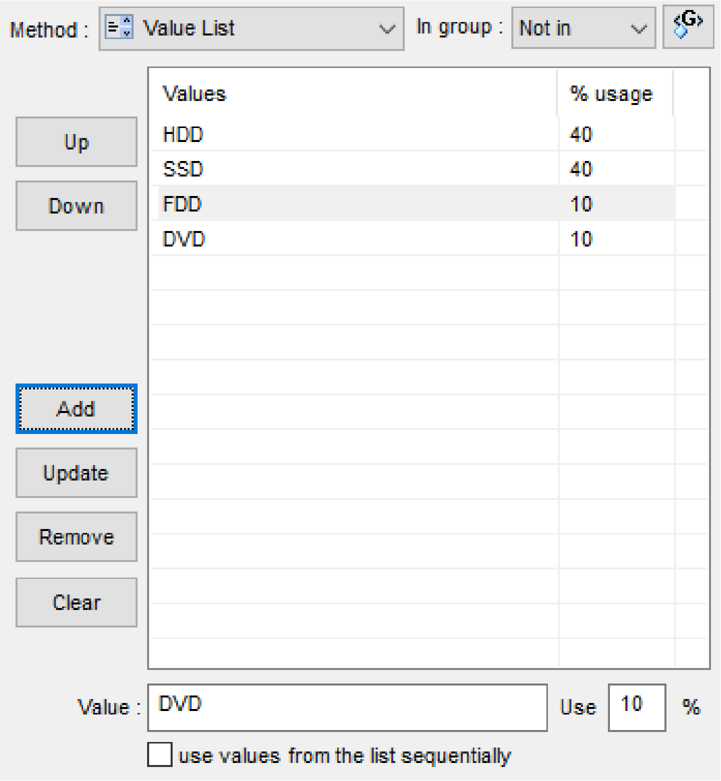
Pattern Engine

$Rint, $Rfloat, $RDate, $Rtime, $RString and $Text functions of the data generation engine provide more options for random data creation.

From list data generation method

This method uses manually entered list of value as a data source for data generation. With the fill method, the program allows you to specify percentage ratio for the entered values. In this case, if no density is specified, the values will be equally distributed. If the percent of usage is specified only for some values, the "rest" of density will be distributed equally between those values which have no density specified for them.

The only option for this fill method is "Use values sequentially". It means the program will use list items from the first to the last. When the list ends the program starts from the first item again.



Method : Value List

In group : Not in

Values	% usage
HDD	40
SSD	40
FDD	10
DVD	10

Value : DVD

Use 10 %

□ use values from the list sequentially

Notes

- You can change the order of the values in the list with Up and Down buttons. Values order is important for "Use values sequentially" mode only.
- Please provide only one list item to define **constant value**.

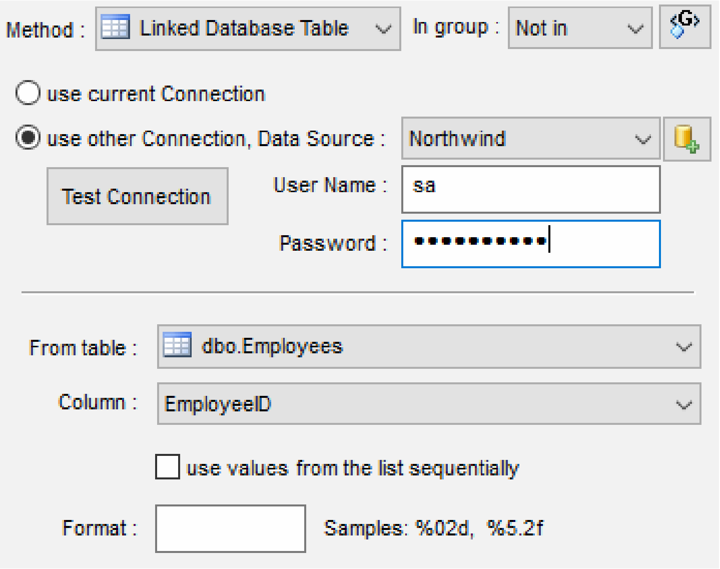
Pattern Engine

The $List function of the engine is more tunable and allows to use non-constant list items. $ListPattern function creates pattern-based lists.

From table data generation method

This method allows to user to specify table and column pair as a source for data generation. The user can select the current connection or use another ODBC connection. There are settings for this fill method:

- "Use values sequentially" option means the program will use linked table values from the first to the last. When the list ends the program starts from the first item again.
- Format defines the view of value. This option is applicable for numeric values only.



Method : Linked Database Table

In group : Not in

○ use current Connection

● use other Connection, Data Source : Northwind

User Name : sa

Password : •••••••••••

From table : dbo.Employees

Column : EmployeeID

□ use values from the list sequentially

Format :

Samples: %02d, %5.2f

Notes

To define WHERE or ORDER BY clause use "By SQL" fill method instead.

"Test Connection" button helps the user to verify custom connection properties: DSN, user name and password.

Pattern Engine

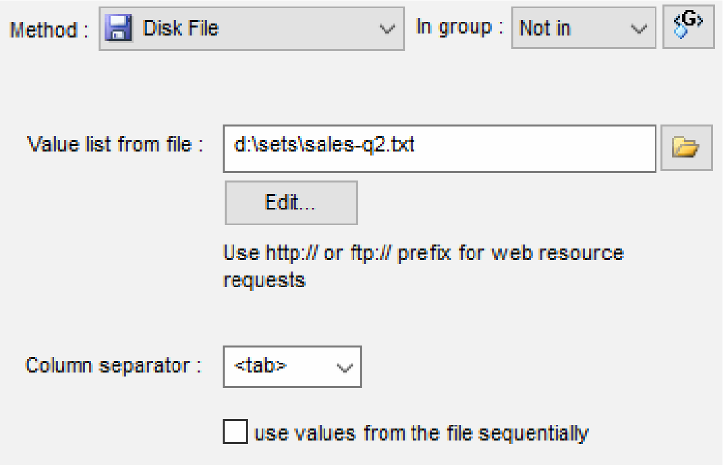
$Table and $TableGroup functions of the engine can be used instead of this fill method. $Table enables the user to provide WHERE clause as a parameter.

From the file data generation method

This generation method enables users to use text local or web-based file as a data source. If the column defines a group the correct value separator should be defined.

There are settings for this data generation method:

- "Value" separator is useful for group definition.
- "Use values sequentially" option means the program will use list items from the first to the last. When the list ends the program starts from the first item again.



Method : Disk File

In group : Not in

Value list from file : d:\sets\sales-q2.txt

Use http:// or ftp:// prefix for web resource requests

Column separator : <tab>

□ use values from the file sequentially

Notes

Unicode version of the data generator recognizes ANSI, UTF8 and UTF16 (Low engian and Big endian) files automatically.

http:// or ftp:// prefix is required for Internet or intranet resource access.

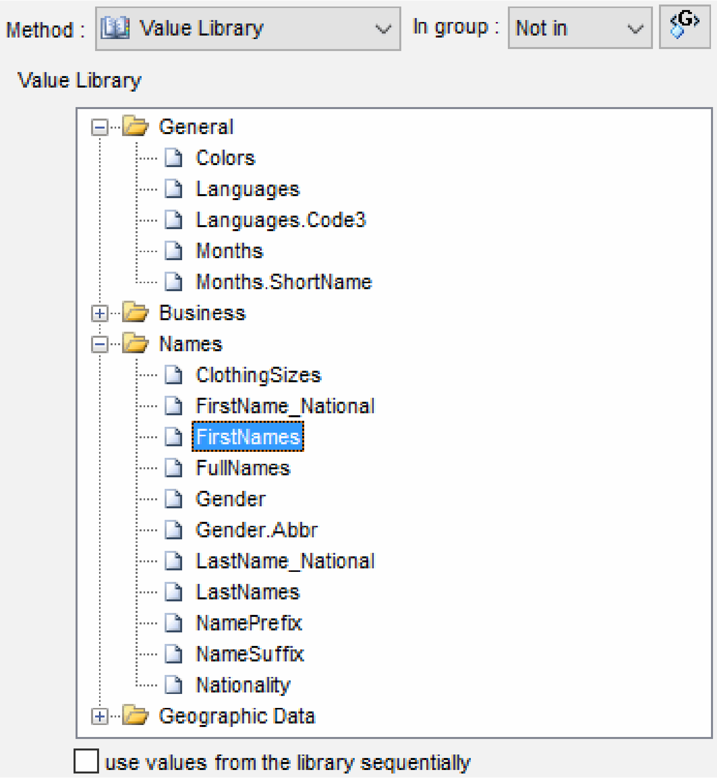
Pattern Engine

$File function of the engine is the alternative of the fill method. $WebFile can request the file from we network over HTTP or FTP call.

From the Value Library data generation method

This method uses predefined list of values as a source.

"Use values sequentially" option means the program will use value library items from the first to the last. When the list ends the program starts from the first item again.



Method : Value Library

In group : Not in

Value Library

- General
  - Colors
  - Languages
  - Languages.Code3
  - Months
  - Months.ShortName
- Business
- Names
  - ClothingSizes
  - FirstName_National
  - FirstNames
  - FullNames
  - Gender
  - Gender.Abbr
  - LastName_National
  - LastNames
  - NamePrefix
  - NameSuffix
  - Nationality
- Geographic Data

□ use values from the library sequentially

Pattern Engine

$Lib function of the engine provides access to all library lists. Also, it enables users to specify maximum acceptable value length and select data from library with specified condition (WHERE clause).

See Also

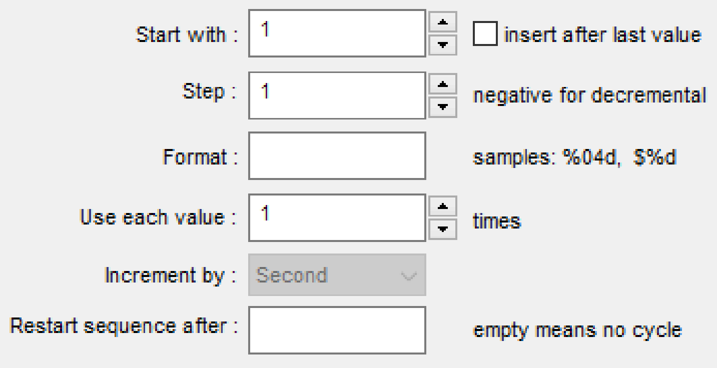
- Library content

Incremental data generation method

Incremental and decremental fill methods are applicable to an integer, date and time data types only*. The initial value and step are most important options of this fill method. For date and time columns "increment by" option is also important.

There is complete set of settings for this filling method:

Option	Default	Description
Starting with	1	Initial value and begin of cycle value
Step	1	Positive or negative** integer. The program will add it to current value at each iteration
Format, for integer only	%d	Value presentation format
Use each value	1	The program can use one generated value more than one time. This option defines number of same values at the output
Increment by, for date and time only	Day or Second	Step value meaning: day, month or year for date and second, minute or hour for time
Restart sequence after		When sequence exceeds this value the program will start it from "Start with" value once again
Insert after last	Off	The option means find the maximum existing value of the column and start with next one. By default, it will use "Starting with" value specified by the user. The option is applicable to numeric columns only for now.



Start with :	1	□ insert after last value
Step :	1	negative for decremental
Format :		samples: %04d, $%d
Use each value :	1	times
Increment by :	Second	
Restart sequence after :		empty means no cycle

Examples

Start	Step	Use each	Cycle	Format	Sample value sequence
5	3	2	0	%03d	005,005,008,008,011,011,...
1	1	1	5		1,2,3,4,5,1,2,3,4,5,1,2,3,4,5,...
1	2	2	6		1,1,3,3,5,5,1,1,3,3,5,5,1,1,3,3,5,5,...

Notes

The variables as Start and Step properties of the fill method are acceptable.

* the data generation engine allows you to use incremental for symbol and numeric/float data types.

** negative step supported for integer values only. Use $IncDate and $IncTime functions of the data generation engine instead to create decremental date or time sequence.

Pattern Engine

The engine provides following functions for incremental data generation: $Inc, $IncDate, $IncTime, $IncChar, $IncFloat. Most of them allow you to use non-constant parameters for starting value and step.

By pattern data generation method

This generation method allows the user to specify pattern as data generator.

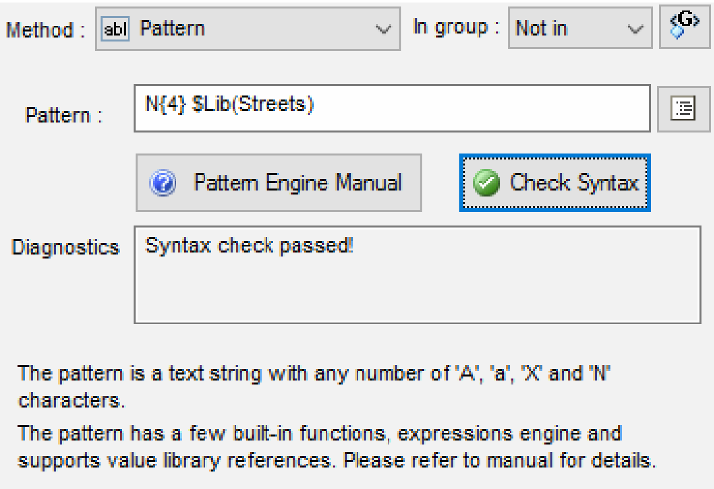
Pattern

The pattern is a text string with any number of 'A', 'a' and 'N' characters. During the value generation process, the 'A' and 'a' characters are replaced with a random letter (from 'A' to 'Z' and from 'a' to 'z') and the 'N' character is replaced with a random figure. {n} means iterate last sign 1 to n times. All the rest of the pattern characters will be moved to the result value without any changes.
If you want to specify several different patterns for filling a field, you should use the "$List" function.
You can use '\' character for escape next pattern sign. For example, \a will be used as an 'a' letter without any replacements.

There are easy pattern items:

- A - letter from 'A' to 'Z'.
- a - letter from 'a' to 'z'.
- N - digit from '0' to '9'.
- X - hexadecimal digit from '0' to '9' and 'A' to 'F'.
- {n} - repeater, the value will be used from 1 to n times. n should be from 1 to 999.
- {=n} - repeater, the value will be used n times.
- {n;m} - repeater, the value will be used from 'n' to 'm' times. 'n' should be less than 'm' and both numbers from 1 to 999.

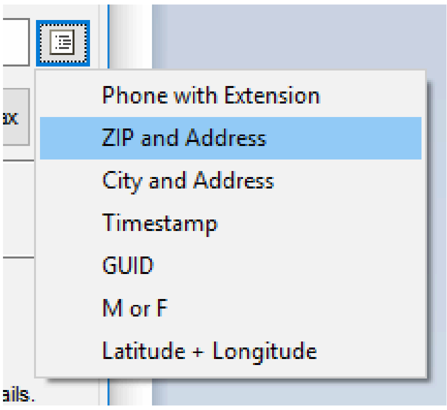
Please refer to detailed pattern engine manual (on-line).


Method : Pattern
In group : Not in
Pattern : N{4} $Lib(Streets)

Diagnostics: Syntax check passed!

The pattern is a text string with any number of 'A', 'a', 'X' and 'N' characters.
The pattern has a few built-in functions, expressions engine and supports value library references. Please refer to manual for details.

The tool offers a few useful predefined patters. They available via menu:



Examples

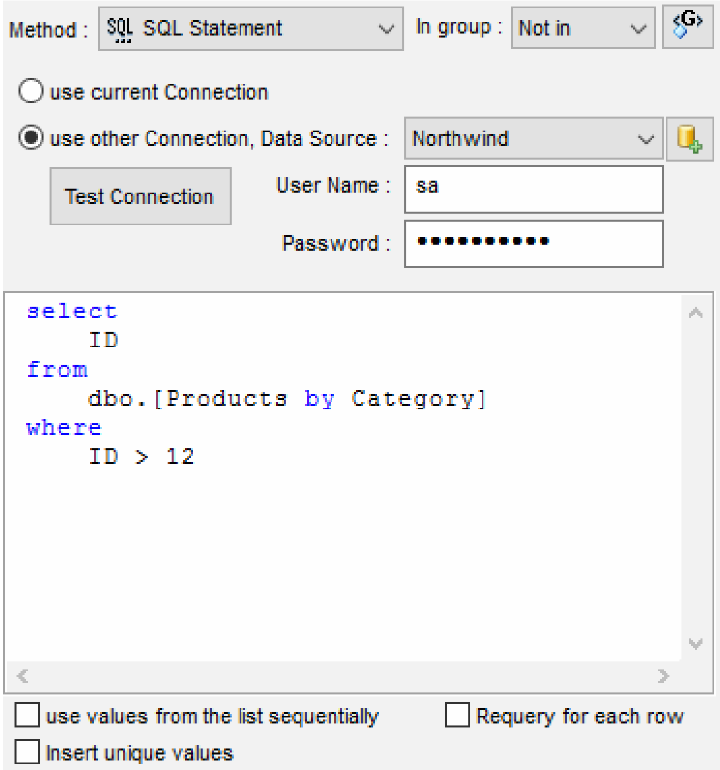
Pattern	Sample values
ANNaaN	K15rb6,J46xm7,V02bq9,A30et4,...
N{3} $Lib{Streets}	3 Jackson Hole Court,342 Christine Avenue,34 Koyuk Avenue...

By SQL statement data generation method

This method is the most convenient one when you want to use the results obtained through using functions built into your DBMS. When the "use first result set's column as a list" option is switched off, independent of the obtained data set, the program will use only the first field of the first record in the results in the generation process. Please refer to fields group feature to use other columns of the result set.

The "Use values sequentially" option instructs the program using list items from the first to the last. When the list ends the program starts from the first item again.

If the "Requery for each row" option is switched on the generator runs the query for each row and uses the first value only. It is suitable for Oracle sequences, unique ID server-side generators, etc.



Method : SQL Statement

In group : Not in

○ use current Connection

● use other Connection, Data Source : Northwind

User Name : sa

Password : •••••••••••

```
select
    ID
from
    dbo.[Products by Category]
where
    ID > 12
```

□ use values from the list sequentially

□ Requery for each row

□ Insert unique values

Note

"Test Connection" button helps the user to verify custom connection properties: DSN, user name and password.

Pattern Engine

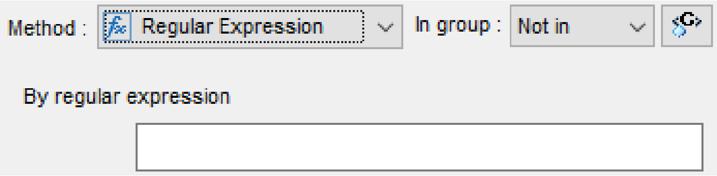
$Query function helps the user to access same functionality of the data generation engine.

By regular expression data generation method

This population method allows the user to specify the regular expression as a data generator.

Regular Expressions

- The program supports standard UNIX-style regular expressions except items mentioned in 'Limitations' section.
- \d means digit
- \w means letter digit or '_'
- \s means space symbols
- Repeaters: {n} means exact n times, {n,m} means between n and m times



Method : Regular Expression

In group : Not in

By regular expression

Limitations

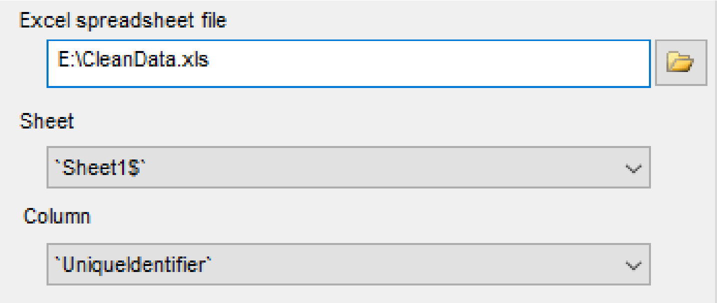
- The program ignores '$' and '^' signs for begin and end.
- The generator does not support negative ranges like [^0-9].
- Only \1 to \9 blocks can be used.

Pattern Engine

$Regexp function of the engine provides the user with the same functionality.

By Excel spreadsheet data generation method

This method helps users to get the value set from Excel spreadsheet. There are three mandatory parameters: file name, sheet (or page) name and column name.



Excel spreadsheet file

E:\CleanData.xls

Sheet

`Sheet1$`

Column

`UniqueIdentifier`

Notes

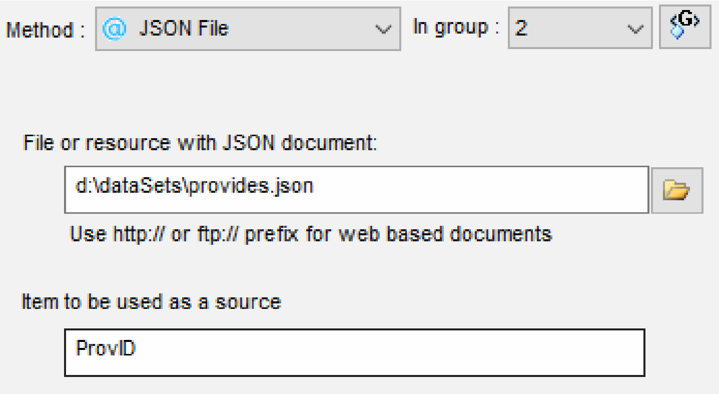
The program expects column names at the first row of the data sheet.

Pattern Engine

$MSExcel function call provides the user with access to the same functionality.

By JSON document data generation method

This method helps users to extract data from the JSON document and use it as a source. There are two mandatory parameters: file name and item. If the item is scalar, the program will use all possible values with this name from the file. If it is an array, the generator will use all items of the array.



Method : JSON File

In group : 2

File or resource with JSON document:

d:\dataSets\provides.json

Use http:// or ftp:// prefix for web based documents

Item to be used as a source

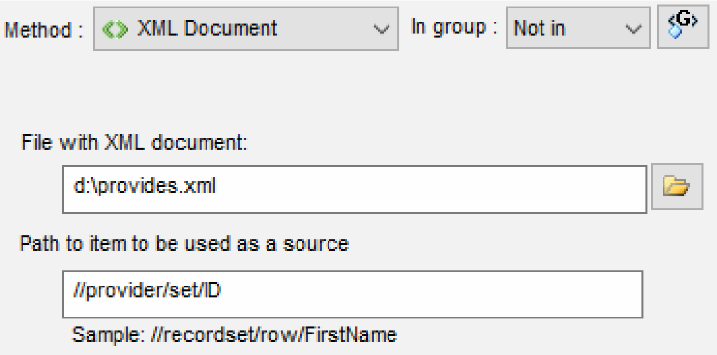
ProvID

Pattern Engine

$JSON function provides the user with access to the same functionality.

By XML document data generation method

This method helps users to get value set from the XML document and use it as a source. There are two mandatory parameters: file name and path to the item.



Method : XML Document

In group : Not in

File with XML document: d:\provides.xml

Path to item to be used as a source: //provider/set/ID

Sample: //recordset/row/FirstName

Pattern Engine

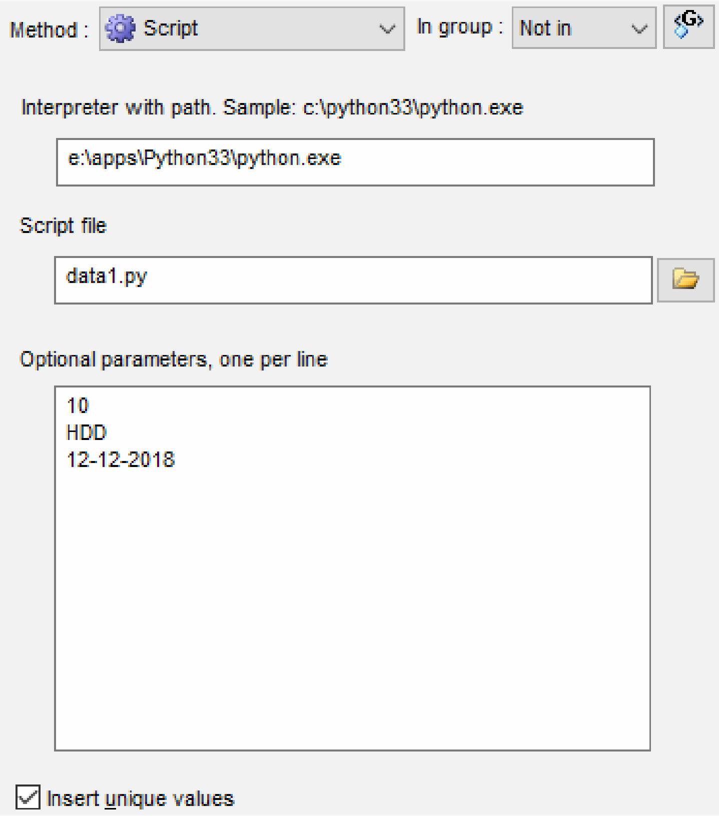
$XML function call provides the user with access to the same functionality.

By Script data generation method

This data generation method can be used to populate data by an external script: Python, Ruby, Perl, etc.

There are two mandatory parameters: path and name of script interpreter and script file name. Also, any number of optional parameters can be passed to the script.

This method supports groups. Be sure that the script returns enough data columns to fill out assigned group.



Method : Script

In group : Not in

Interpreter with path. Sample: c:\python33\python.exe

e:\apps\Python33\python.exe

Script file

data1.py

Optional parameters, one per line

```
10
HDD
12-12-2018
```

☑ Insert unique values

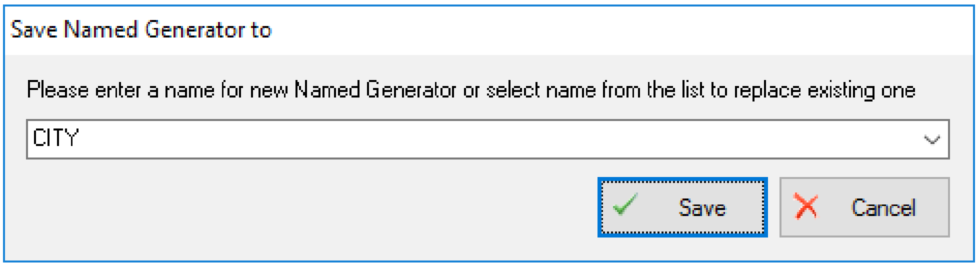
Pattern Engine

$Script function of the engine provides the user with access to Script call feature.

Named Generators

Named Generator is a set of data generation properties of the single column that saved by name. The user can apply it to any compatible field. We strongly recommend using named generator for same data type column as original column.

Please use related button to save current column properties as named generator.

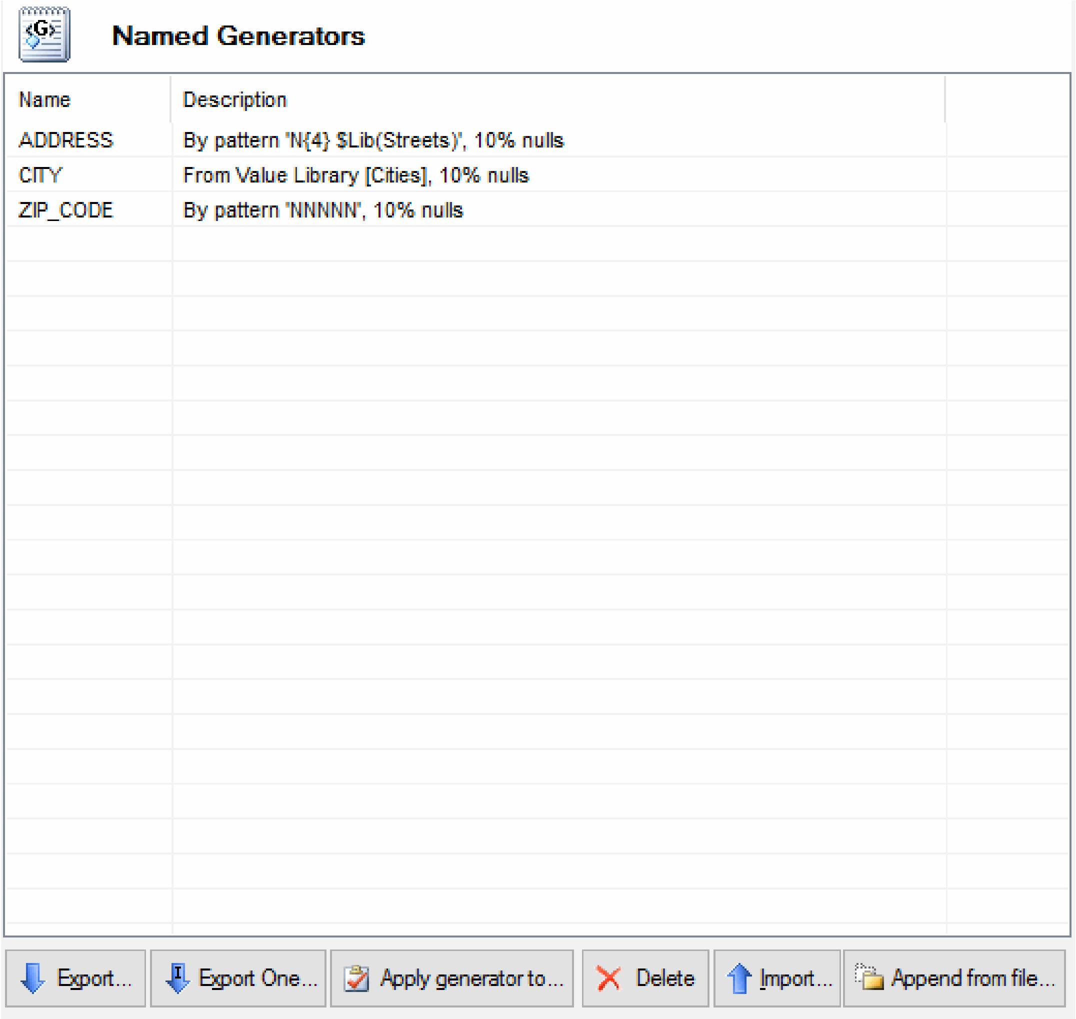


Save Named Generator to

Please enter a name for new Named Generator or select name from the list to replace existing one

CITY

The user can overview all available named generators using the window that can be accessed by "Named Generator" item in the navigation tree.



Named Generators

Name	Description
ADDRESS	By pattern 'N{4} $Lib(Streets)', 10% nulls
CITY	From Value Library [Cities], 10% nulls
ZIP_CODE	By pattern 'NNNNN', 10% nulls

Note: Named Generator delete, export, and import options are not available in the standard version of the generator.

Field Group

A group of fields is a few columns for which data is generated together. A group allows the user to work with similar fields changing generation parameters only in one place. A group consists of the first defining field and fields that depend on it.

A group is processed depending on the fill method applied to the defining field:

1. For methods "Ignore", "Random", "By pattern", "List", "Incremental", "From Table" and "Value Library", exactly the same methods and generation parameters that are applied to the defining field are applied to dependent fields.
2. For methods "By SQL statement" and "List from disk file", not only the first column in the file or the result set, but also columns following it will be used. Values in these columns will be used to generate dependent fields.

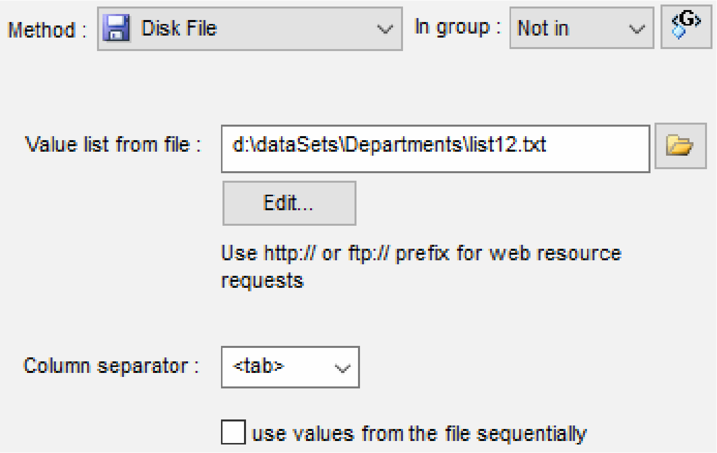
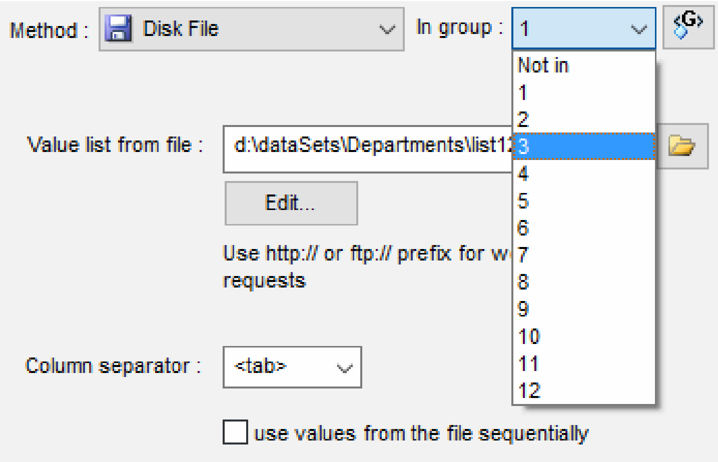
To create a group, select the unique group number from the drop-down "In group" menu. To delete a group select "Not in" in the same drop-down. To add depended column to created group select same group number and "group item" as fill method.

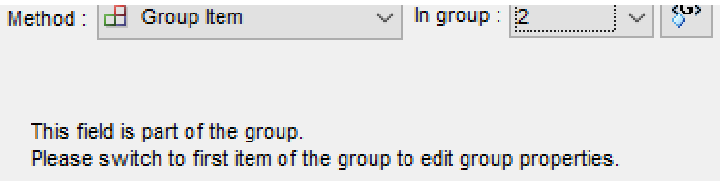
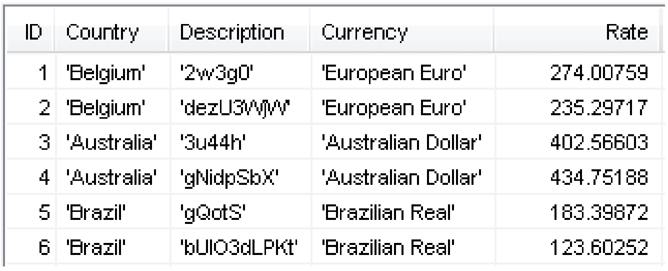
Example

You have a pipe-delimited text file (coutries_with_currency.txt) with country and currency list in the following format:

```
Australia|Australian   Dollar
Belgium|European   Euro
Brazil|Brazilian   Real
...
```

You have two fields "Country" and "Currency" in the "Countries" table. How to fill them out together:

Step	Description	Screenshot
1	1) Use "from file" fill method for the first (Country) column. 2) Select file with mentioned data. 3) Select pipe as column separator.	 Method : Disk File In group : Not in Value list from file : d:\dataSets\Departments\list12.txt Edit... Use http:// or ftp:// prefix for web resource requests Column separator : <tab> □ use values from the file sequentially
2	Select new group in the "in group" menu	 Method : Disk File In group : 1 Not in 1 2 3 4 5 6 7 8 9 10 11 12 Value list from file : d:\dataSets\Departments\list12 Edit... Use http:// or ftp:// prefix for w requests Column separator : <tab> □ use values from the file sequentially

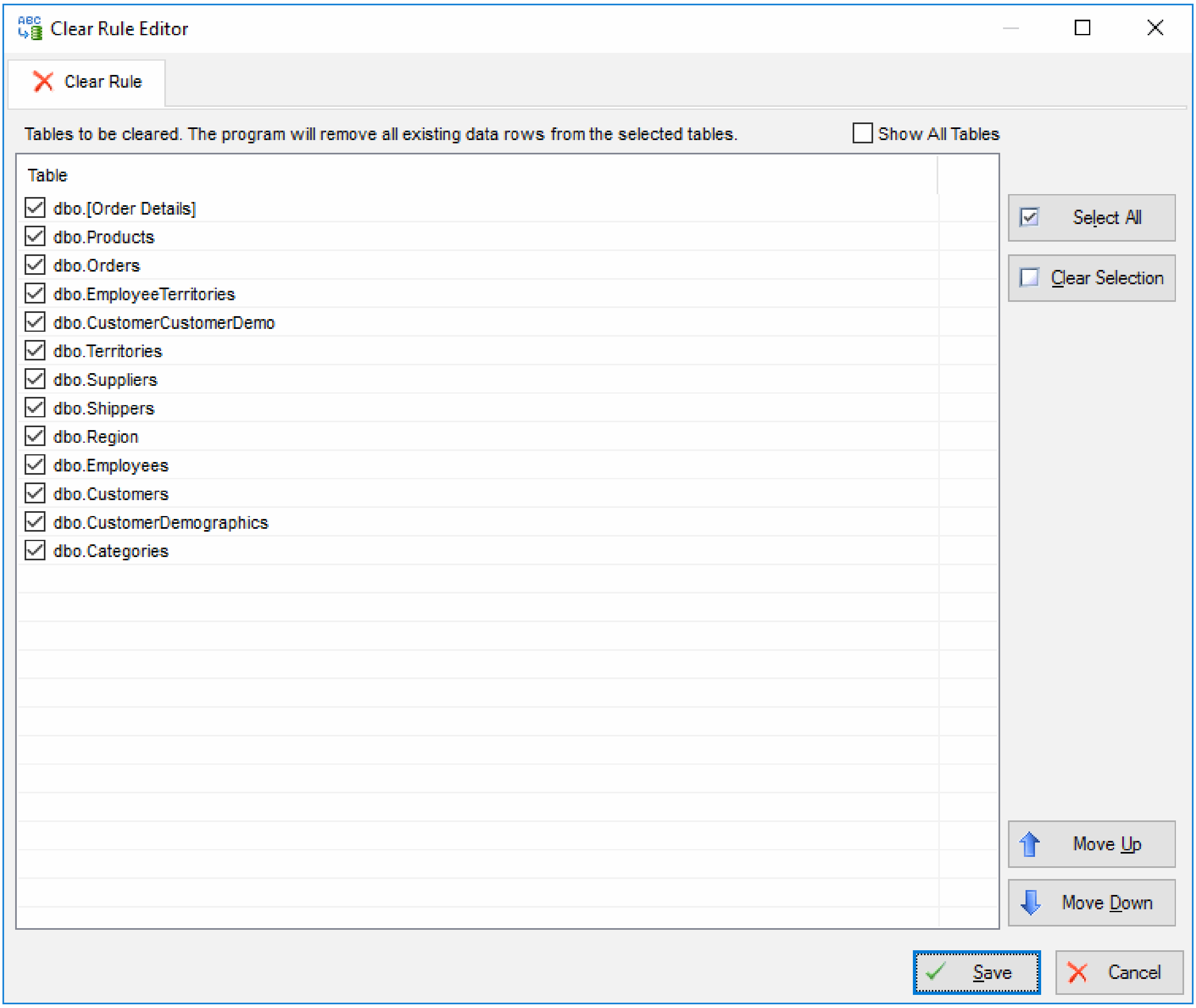
<table>
<tr>
<td>3</td>
<td>Select "group item" fill method and attach column to same group (#1)</td>
<td>
Method : Group Item
In group : 2
This field is part of the group.
Please switch to first item of the group to edit group properties.</td>
</tr>
<tr>
<td>4</td>
<td>View results at the preview Window. "Country" and "Currency" columns are coordinated.</td>
<td>
<table>
<tr><th>ID</th><th>Country</th><th>Description</th><th>Currency</th><th>Rate</th></tr>
<tr><td>1</td><td>'Belgium'</td><td>'2w3g0'</td><td>'European Euro'</td><td>274.00759</td></tr>
<tr><td>2</td><td>'Belgium'</td><td>'dezU3WjW'</td><td>'European Euro'</td><td>235.29717</td></tr>
<tr><td>3</td><td>'Australia'</td><td>'3u44h'</td><td>'Australian Dollar'</td><td>402.56603</td></tr>
<tr><td>4</td><td>'Australia'</td><td>'gNidpSbX'</td><td>'Australian Dollar'</td><td>434.75188</td></tr>
<tr><td>5</td><td>'Brazil'</td><td>'gQotS'</td><td>'Brazilian Real'</td><td>183.39872</td></tr>
<tr><td>6</td><td>'Brazil'</td><td>'bUIO3dLPKt'</td><td>'Brazilian Real'</td><td>123.60252</td></tr>
</table>
</td>
</tr>
</table>

Clear Tables Rule

This dialog box allows you to create or edit the Clear rule. This rule is used for removing data rows from tables that have generation rules created for them. We recommend that you insert this rule at the beginning of your project for clearing to be carried out before data generation.

In order to automate the process of creating this rule, create all rules for tables before you start creating it. In this case, the program will take into account the order and structure of tables present in the project.

Another way to create this rule is to select the Show All mode and specify the tables you need manually. In this case, the correct order also has to be specified manually.



Tables to be cleared. The program will remove all existing data rows from the selected tables.

□ Show All Tables

Table
☑ dbo.[Order Details]
☑ dbo.Products
☑ dbo.Orders
☑ dbo.EmployeeTerritories
☑ dbo.CustomerCustomerDemo
☑ dbo.Territories
☑ dbo.Suppliers
☑ dbo.Shippers
☑ dbo.Region
☑ dbo.Employees
☑ dbo.Customers
☑ dbo.CustomerDemographics
☑ dbo.Categories

Table Creation Rule

To create a set of tables specify the pattern of the table name as well as the specification for each field of the table. Such set of tables can be useful when you want to test your application (a Database Schema Browser, for example) in a situation when there are thousands or tens of thousands of tables in the database.

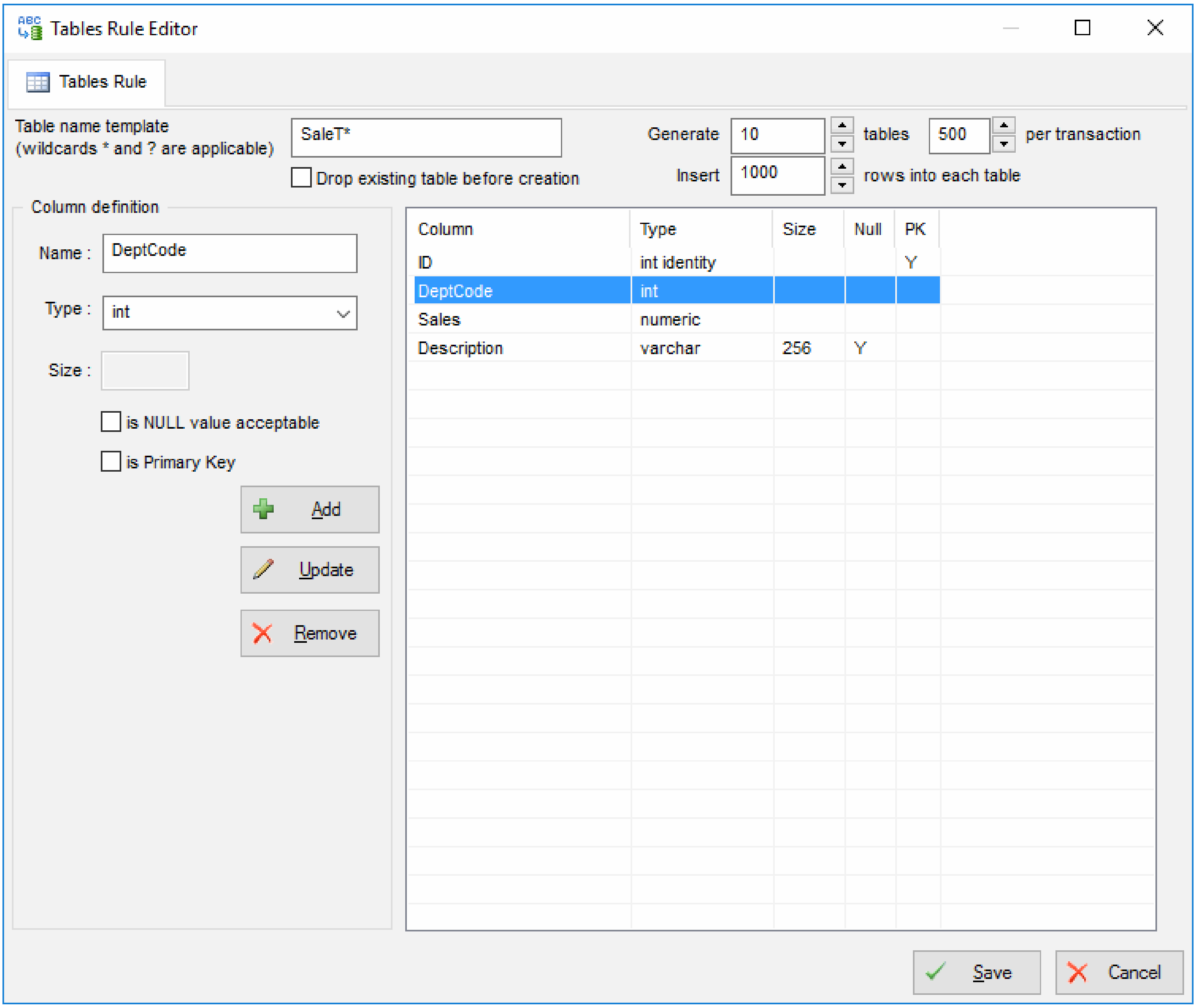


Table name template (wildcards * and ? are applicable): SaleT*

Generate 10 tables 500 per transaction

Insert 1000 rows into each table

☐ Drop existing table before creation

Name : DeptCode

Type : int

Size :

☐ is NULL value acceptable

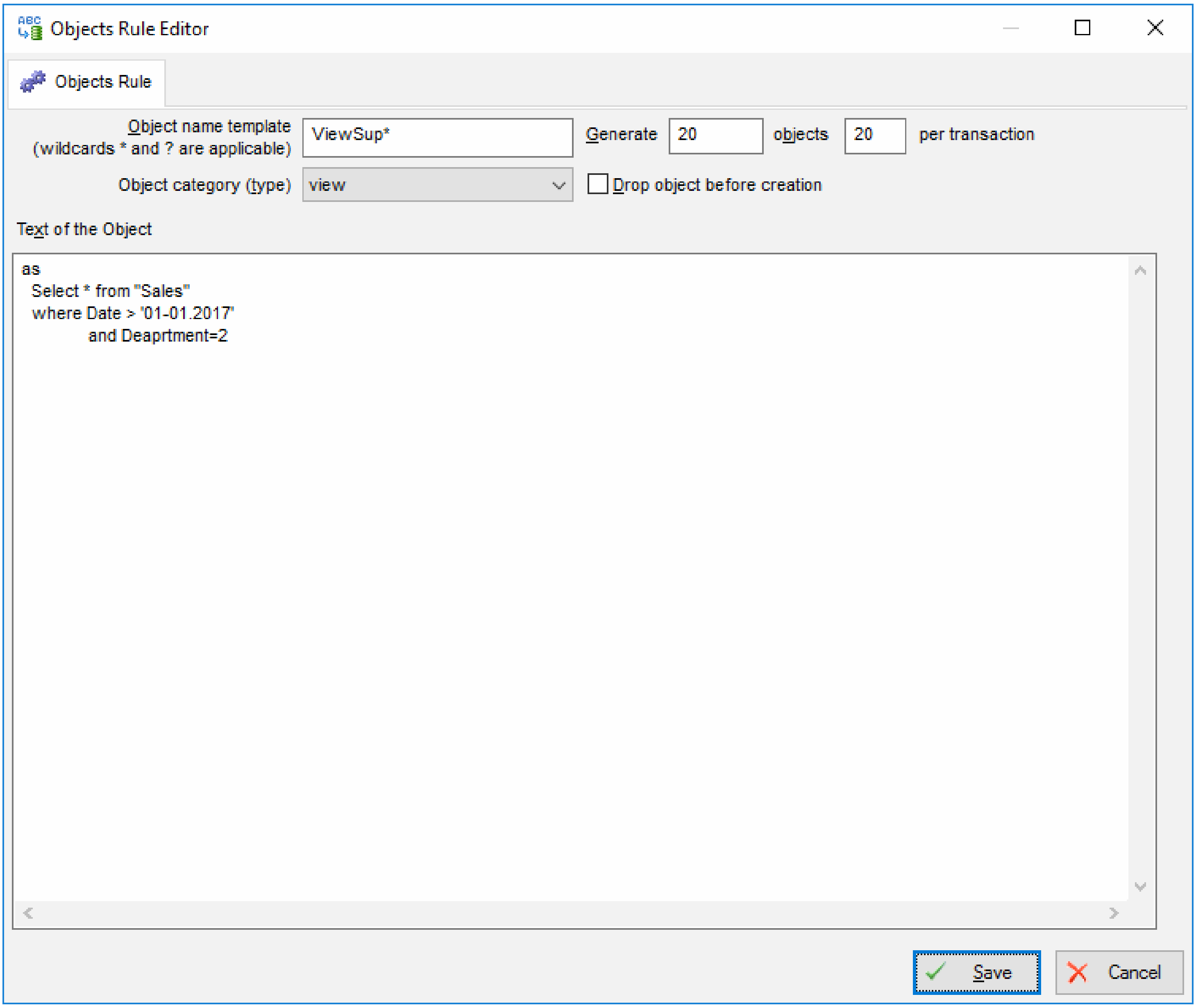
☐ is Primary Key

Column	Type	Size	Null	PK
ID	int identity			Y
DeptCode	int			
Sales	numeric			
Description	varchar	256	Y	

Objects Creation Rule

Objects Creation Rule is available in Enterprise edition of the tool and allows to create database objects by template

To create a set of objects specify the pattern of the object name as well as the specification for the text of the object.



Object name template (wildcards * and ? are applicable): ViewSup*

Generate 20 objects 20 per transaction

Object category (type): view

□ Drop object before creation

Text of the Object

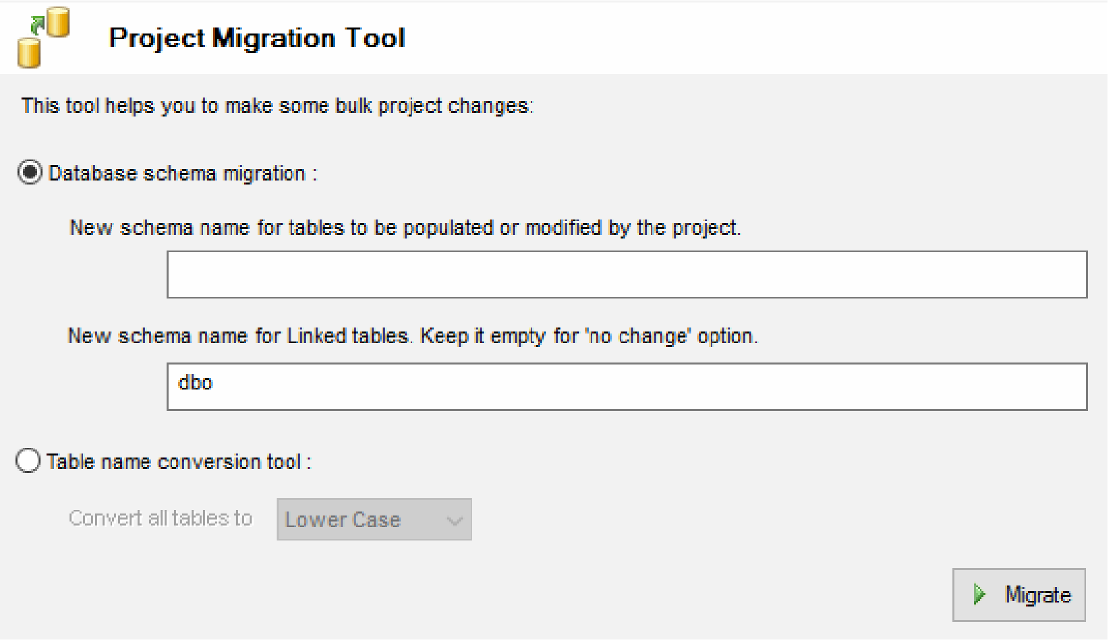
```
as
  Select * from "Sales"
  where Date > '01-01.2017'
            and Deaprtment=2
```

Project Migration Tools

These tools will help you when you want to make some bulk project modifications:

- Migrate your project from one database connection to another and a new connection has different schema name.
- Change all tables name capitalization to lower case or upper case.

This dialog allows you to enter a new schema name for base tables as well as for linked tables.



Project Migration Tool

This tool helps you to make some bulk project changes:

● Database schema migration :

New schema name for tables to be populated or modified by the project.

New schema name for Linked tables. Keep it empty for 'no change' option.

dbo

○ Table name conversion tool :

Convert all tables to: Lower Case

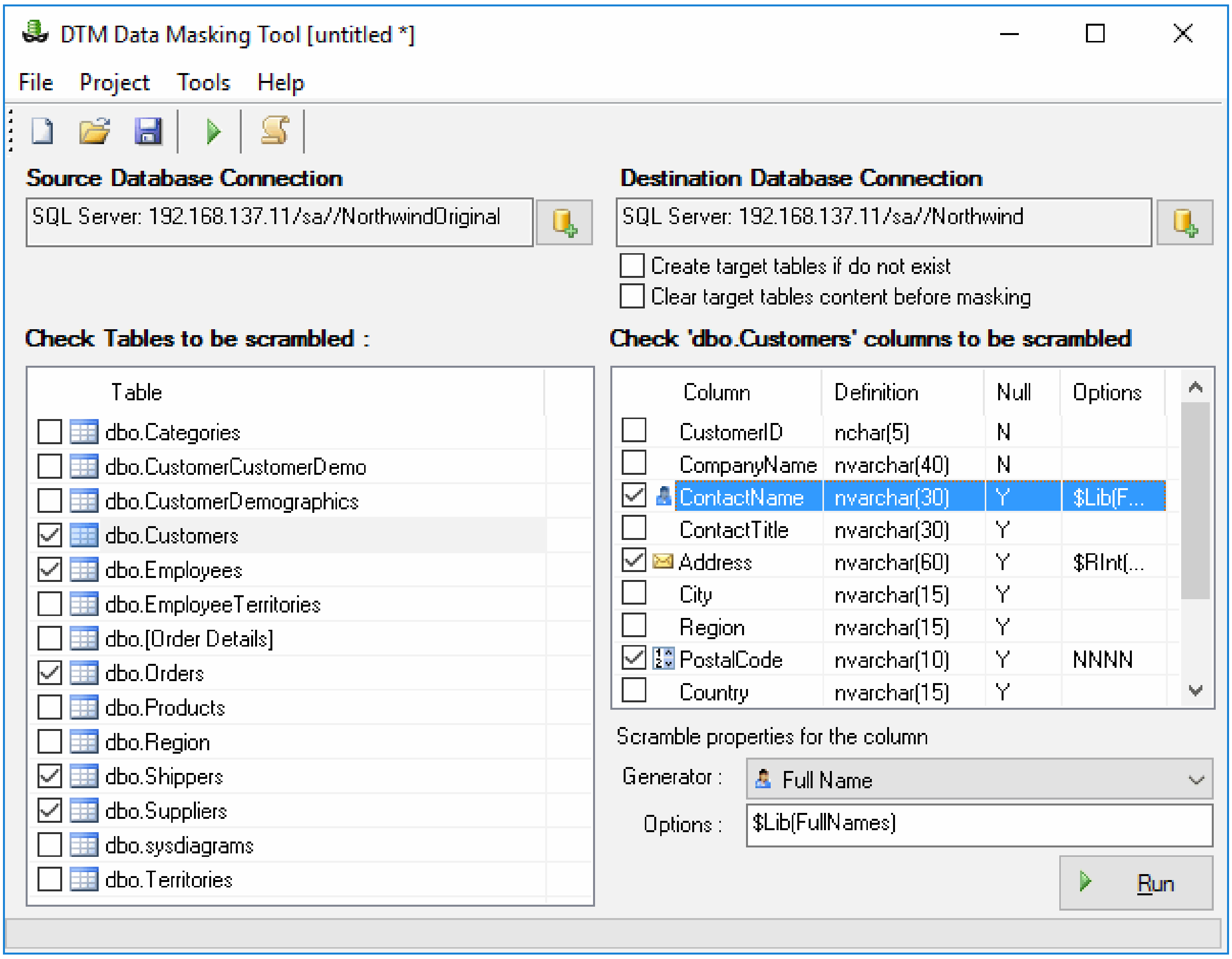
Data Masking Tool

DTM Data Masking tool* provides users with an alternate way to scramble data. Please, use "Utilities->Data Masking Tool" menu item to run it.

To create the project with this tool user should:

- Connect to source and target databases. The tool expects two different connections
- Check tables to be scrambled
- Check columns of each table to be scrambled
- Assign data generator and, if necessary, options for each column to be scrambled
- Save the project file
- Run the process immediately or with DTM Data Generator

* - available in Enterprise edition of the software only.



Source Database Connection

SQL Server: 192.168.137.11/sa//NorthwindOriginal

Destination Database Connection

SQL Server: 192.168.137.11/sa//Northwind

□ Create target tables if do not exist

□ Clear target tables content before masking

Check Tables to be scrambled :

	Table
□	dbo.Categories
□	dbo.CustomerCustomerDemo
□	dbo.CustomerDemographics
☑	dbo.Customers
☑	dbo.Employees
□	dbo.EmployeeTerritories
□	dbo.[Order Details]
☑	dbo.Orders
□	dbo.Products
□	dbo.Region
☑	dbo.Shippers
☑	dbo.Suppliers
□	dbo.sysdiagrams
□	dbo.Territories

Check 'dbo.Customers' columns to be scrambled

	Column	Definition	Null	Options
□	CustomerID	nchar(5)	N	
□	CompanyName	nvarchar(40)	N	
☑	ContactName	nvarchar(30)	Y	$Lib(F...
□	ContactTitle	nvarchar(30)	Y	
☑	Address	nvarchar(60)	Y	$RInt(...
□	City	nvarchar(15)	Y	
□	Region	nvarchar(15)	Y	
☑	PostalCode	nvarchar(10)	Y	NNNN
□	Country	nvarchar(15)	Y	

Scramble properties for the column

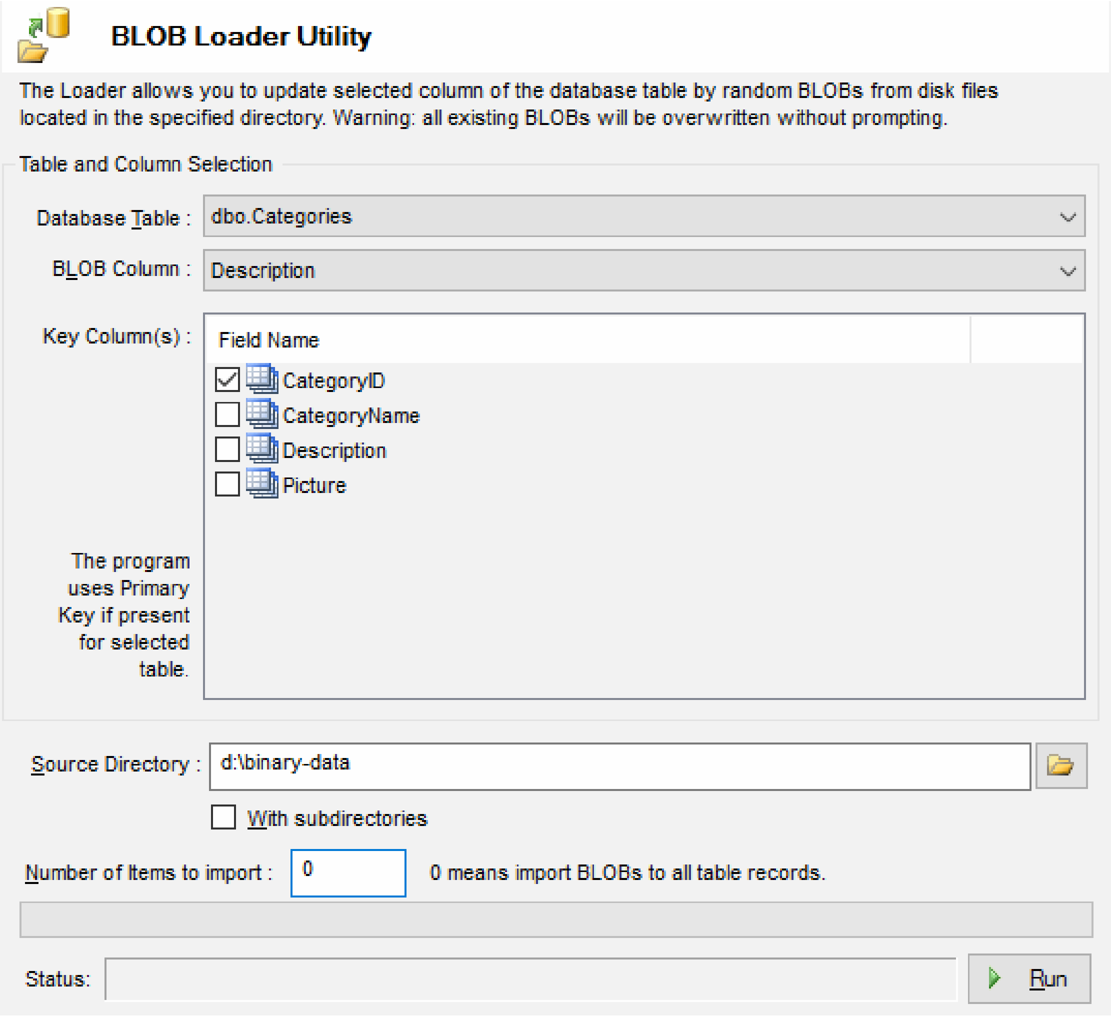
Generator : Full Name

Options : $Lib(FullNames)

Random BLOB loader

The Large Object Loader utility allows you to update selected column of the database table by random BLOBs from disk files located in the specified directory. **Warning**: all existing BLOBs will be overwritten without prompting.
The main purpose of the utility is loading objects to the existing table, for which DTM Data Generator has already generated data. The utility randomly selects files from the folder specified by the user, using them as objects.

The utility uses current database connection provided by the data generator. You should select a table and a field where the data will be loaded. If the table has a primary key, the program uses it automatically. If it doesn't, you should manually specify fields by which the program will search for unique records for loading. Be attentive when you select them.
The utility can load values both to all available records and to several records from the beginning of the table, if the corresponding parameter is specified. If you need to load data to more than one field, you should start the process several times, changing the field name and probably the folder with source files.



BLOB Loader Utility

The Loader allows you to update selected column of the database table by random BLOBs from disk files located in the specified directory. Warning: all existing BLOBs will be overwritten without prompting.

Table and Column Selection

Database Table : dbo.Categories

BLOB Column : Description

Key Column(s) :

Field Name
☑ CategoryID
□ CategoryName
□ Description
□ Picture

The program uses Primary Key if present for selected table.

Source Directory : d:\binary-data

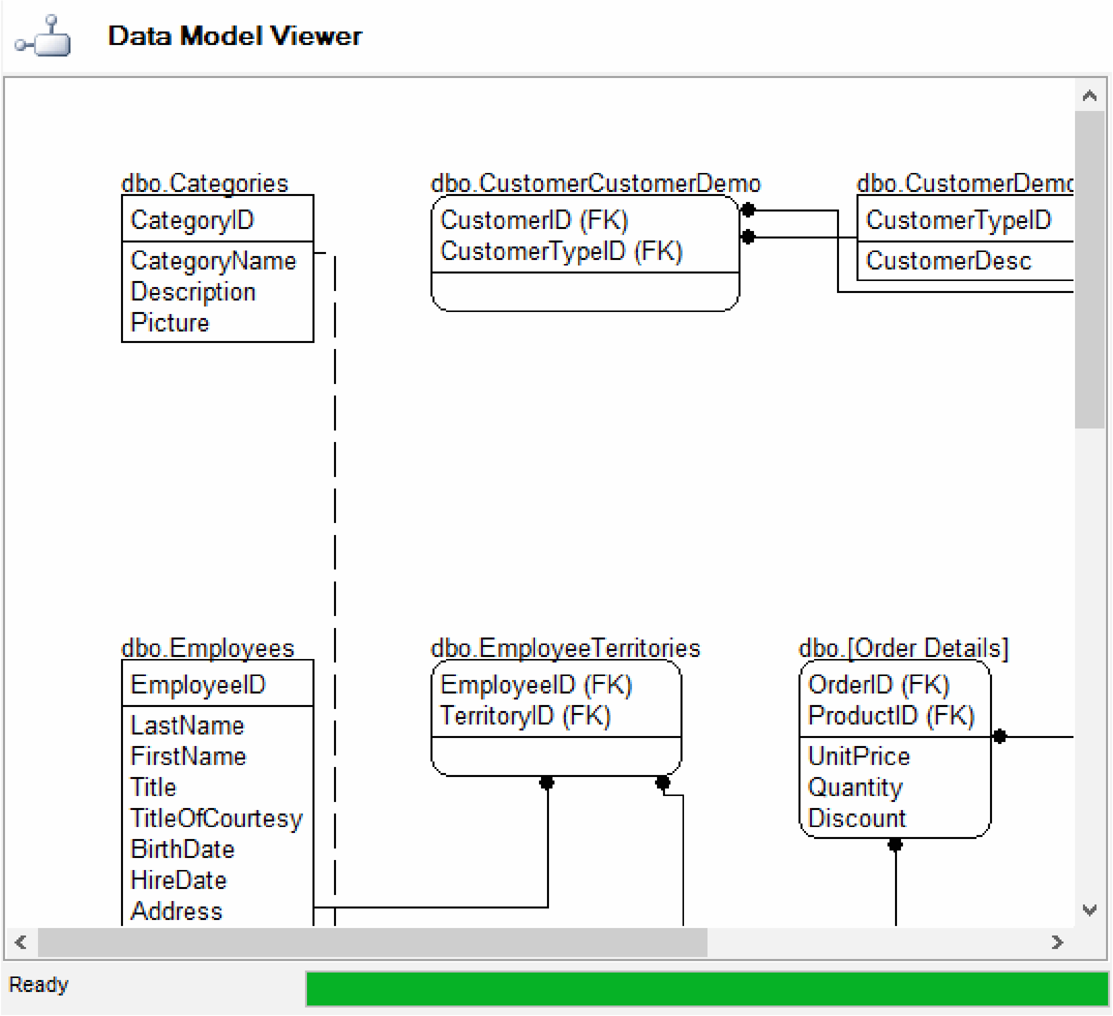
□ With subdirectories

Number of Items to import : 0 — 0 means import BLOBs to all table records.

Status:

Entity -Relationship (ER) model viewer

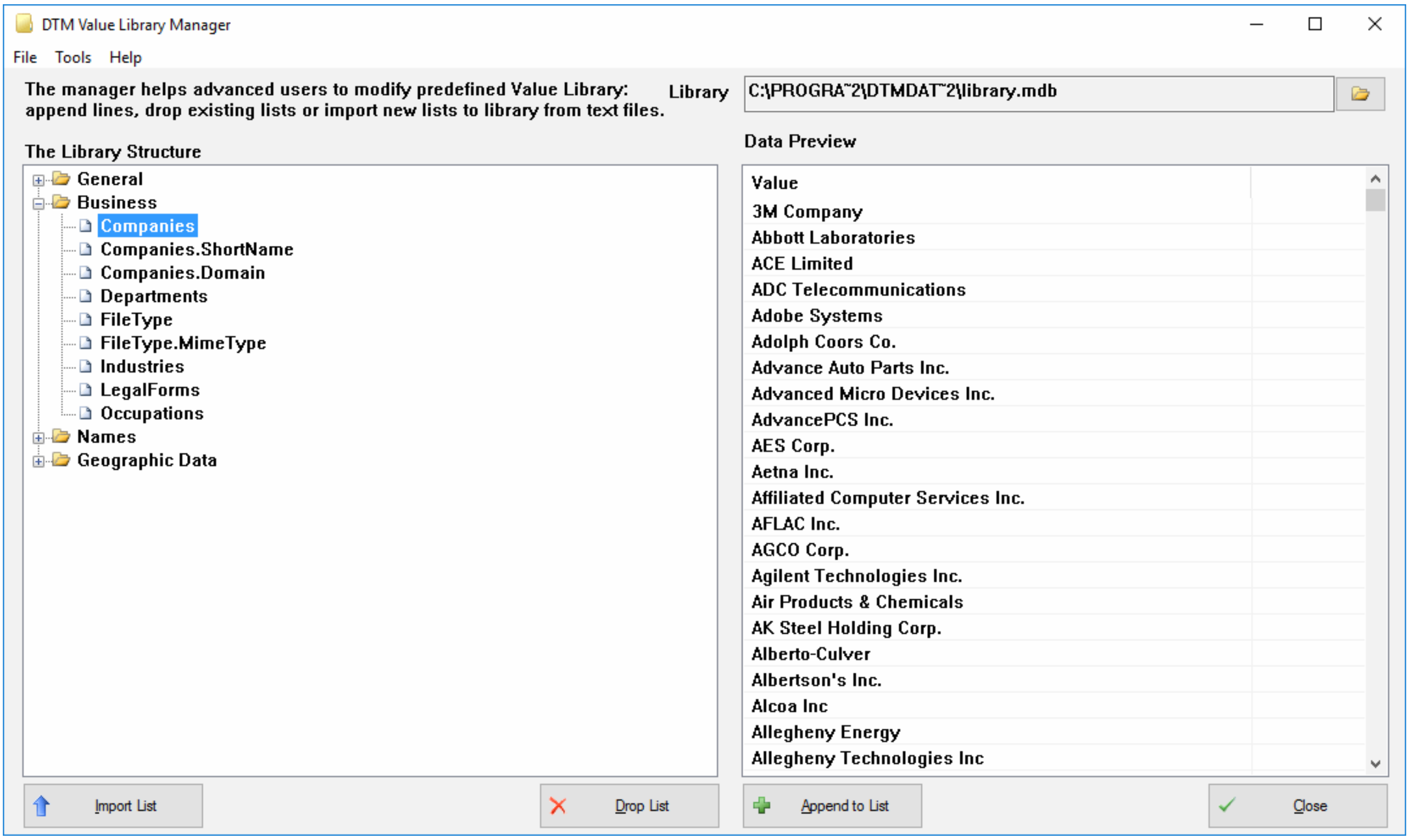
This window allows you to view Entity-Relationship model for the current database connection. It is read-only and can be used for information purpose only.



Value Library Manager

The Library Manager is a supplemental tool included in the Enterprise edition of DTM Data Generator. Please, use "Utilities->Value Library Manager" menu item to run it.

It provides users with most popular operations with Value Library: list extension by appending data, new list creation and drop existing list.
The tool accepts one value per line format of files to be imported.



The manager helps advanced users to modify predefined Value Library: append lines, drop existing lists or import new lists to library from text files.

Library: C:\PROGRA~2\DTMDAT~2\library.mdb

The Library Structure

- General
- Business
  - Companies
  - Companies.ShortName
  - Companies.Domain
  - Departments
  - FileType
  - FileType.MimeType
  - Industries
  - LegalForms
  - Occupations
- Names
- Geographic Data

Data Preview

Value
3M Company
Abbott Laboratories
ACE Limited
ADC Telecommunications
Adobe Systems
Adolph Coors Co.
Advance Auto Parts Inc.
Advanced Micro Devices Inc.
AdvancePCS Inc.
AES Corp.
Aetna Inc.
Affiliated Computer Services Inc.
AFLAC Inc.
AGCO Corp.
Agilent Technologies Inc.
Air Products & Chemicals
AK Steel Holding Corp.
Alberto-Culver
Albertson's Inc.
Alcoa Inc
Allegheny Energy
Allegheny Technologies Inc

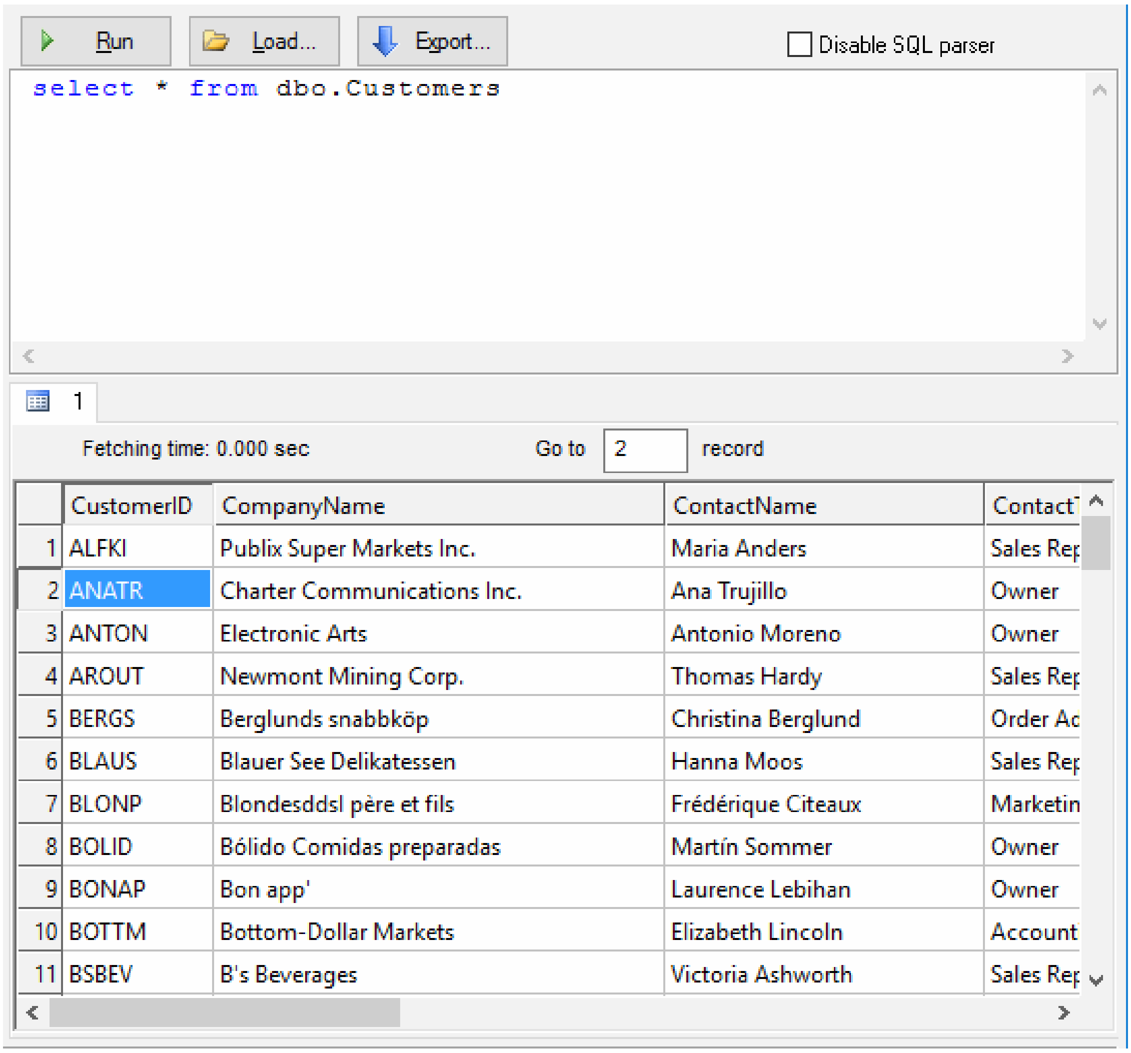
Important: the manager requires administrative privileges to make file operations in Program Files directory: backup original file and library changes.

SQL Console

The tool has a special window where you can specify and execute any SQL statements. You can copy the results of executing a statement onto the clipboard or export it into various formats like text, SQL, HTML, XML or Microsoft Excel. Placing the mouse cursor over the column header will show the type of data stored in this field.

Important: the SQL console does not show any warning before data deletion or modifying.

Note: SQL console shows only begins of large strings. Typically you can view up to 512 first symbols.



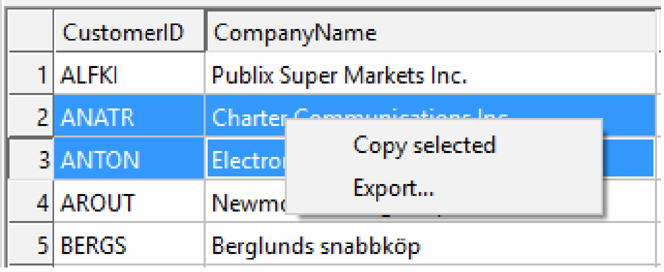
```
select * from dbo.Customers
```

Fetching time: 0.000 sec   Go to 2 record

	CustomerID	CompanyName	ContactName	Contact
1	ALFKI	Publix Super Markets Inc.	Maria Anders	Sales Rep
2	ANATR	Charter Communications Inc.	Ana Trujillo	Owner
3	ANTON	Electronic Arts	Antonio Moreno	Owner
4	AROUT	Newmont Mining Corp.	Thomas Hardy	Sales Rep
5	BERGS	Berglunds snabbköp	Christina Berglund	Order Ac
6	BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Rep
7	BLONP	Blondesddsl père et fils	Frédérique Citeaux	Marketin
8	BOLID	Bólido Comidas preparadas	Martín Sommer	Owner
9	BONAP	Bon app'	Laurence Lebihan	Owner
10	BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Account
11	BSBEV	B's Beverages	Victoria Ashworth	Sales Rep

Menu item "Load" allows you to read SQL script from the external file.

There is a picture of local menu accessed by the right click inside the results window.



	CustomerID	CompanyName
1	ALFKI	Publix Super Markets Inc.
2	ANATR	Charter Communications Inc.
3	ANTON	Electro
4	AROUT	Newmo
5	BERGS	Berglunds snabbköp

Project Report

The project report is HTML document with detailed information about project properties and data generation rules.
The user can view it with built-in browser or save to disk file with 'File ->Save Project Report' menu item.

Custom data generators

Custom data generator is an external DLL that contains complex data generation procedure.

To access custom generator the user should call $DLL function of the "By pattern" fill method.

How to create custom data generator?

The programmer who want to create own generator should:

- Create standard windows DLL
- Build two functions Install and GetValue. See below for details.
- Export these functions from DLL.

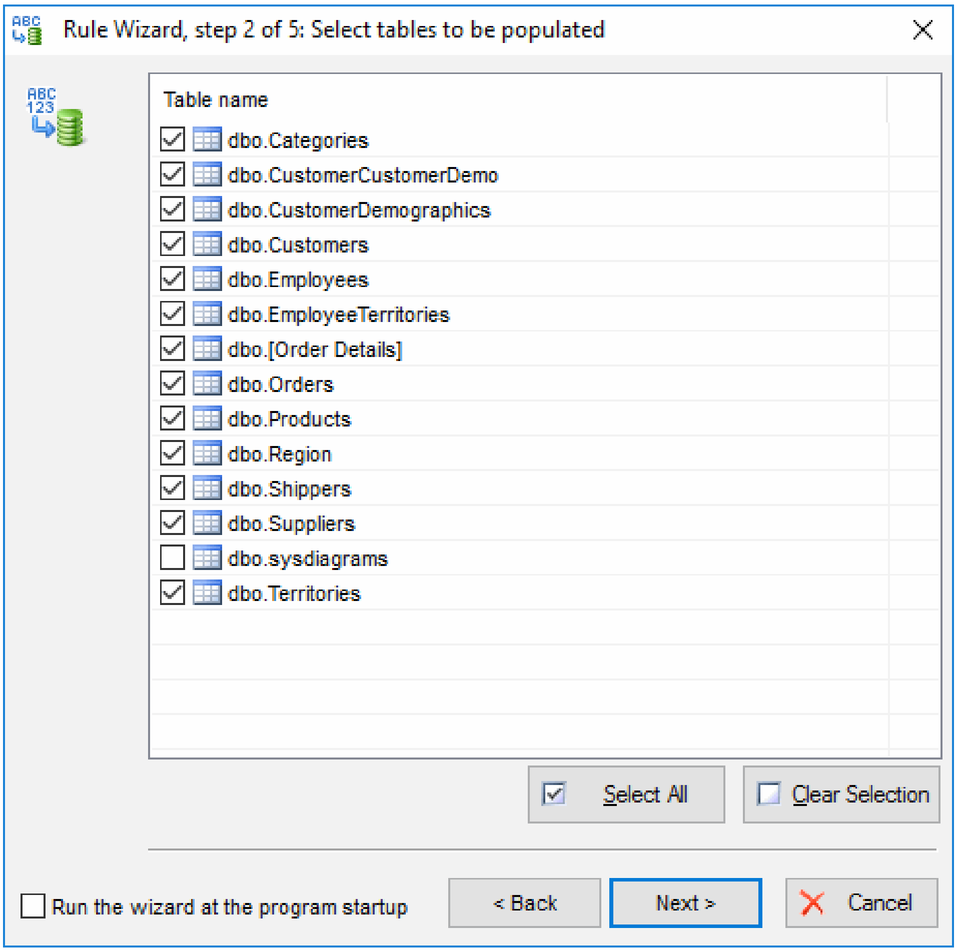
```
TCHAR* WINAPI Install(const TCHAR *param)
{
        return "Name of the generator";
}

TCHAR* WINAPI GetValue(void *)
{
        return "Some value";
}
```

Important note: you should use different custom generator's DLL for ANSI and Unicode version of the software product.

Select tables for data generation rules

This window allows you to select one or more table for data generation. For a single table just mark the required object in the list and go over to the next step. In the other case mark the required tables in the list.



Rule Wizard, step 2 of 5: Select tables to be populated

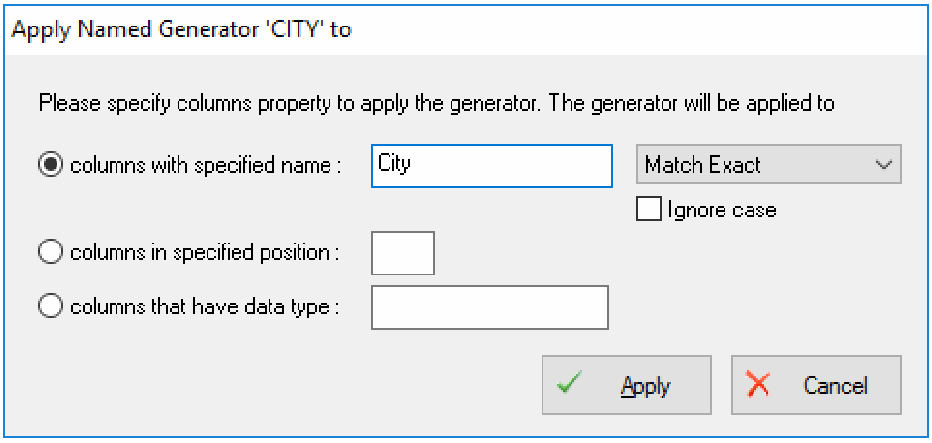
Table name
☑ dbo.Categories
☑ dbo.CustomerCustomerDemo
☑ dbo.CustomerDemographics
☑ dbo.Customers
☑ dbo.Employees
☑ dbo.EmployeeTerritories
☑ dbo.[Order Details]
☑ dbo.Orders
☑ dbo.Products
☑ dbo.Region
☑ dbo.Shippers
☑ dbo.Suppliers
□ dbo.sysdiagrams
☑ dbo.Territories

See also: Rule Wizard.

Bulk project changes

This option is a perfect way to apply bulk modifications to your project.
The program will scan currently loaded project and assign selected named generator to all fields with specified properties

There are three ways to select mentioned fields set: by column name or it's part, by column position in the table and by data type.


Apply Named Generator 'CITY' to

Please specify columns property to apply the generator. The generator will be applied to

● columns with specified name : City Match Exact

□ Ignore case

○ columns in specified position :

○ columns that have data type :

Table Information

This dialog box shows indexes, check constraints (Microsoft SQL Server only) and triggers of the table currently selected.

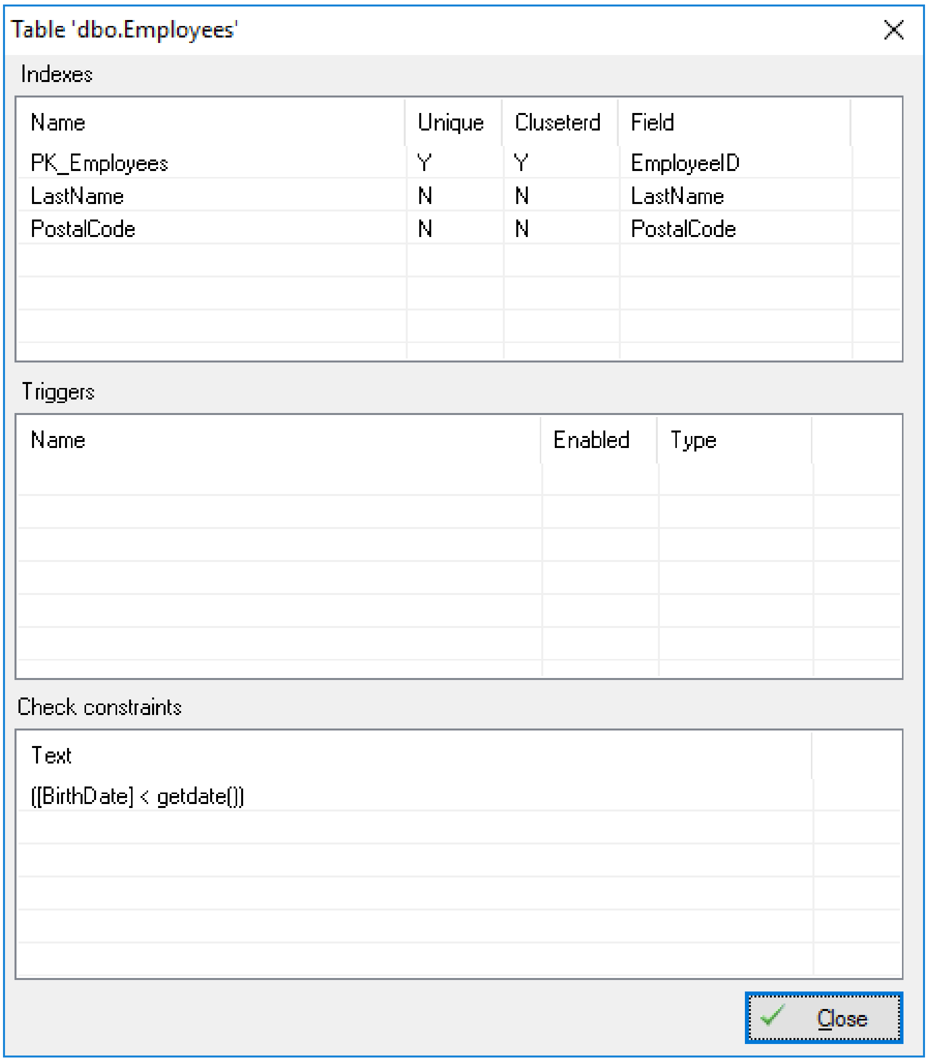


Table 'dbo.Employees'

Indexes

Name	Unique	Cluseterd	Field
PK_Employees	Y	Y	EmployeeID
LastName	N	N	LastName
PostalCode	N	N	PostalCode

Triggers

Name	Enabled	Type

Check constraints

Text
([BirthDate] < getdate())

Value Library

Value Library is a set of frequently used value lists that you can use as a data sources during the generation process.

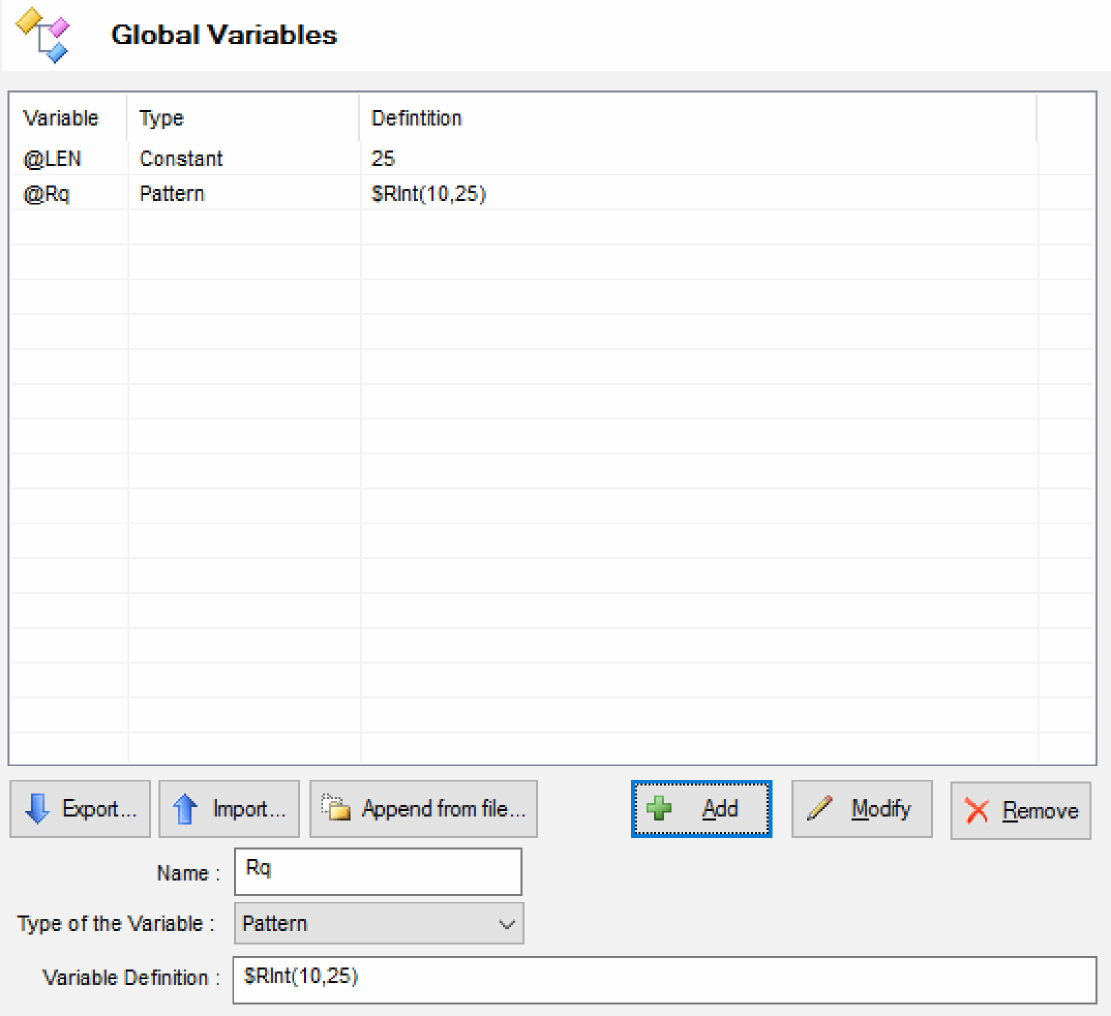
The following data sets are included in the software distribution package:

- the list of countries,with country codes: Numeric, Alpha-2 and Alpha-3 by ISO 3166-1, currency codes
- the list of US states with codes (like ISO 3166-2:US) and state Capitals,
- the list of female first names,
- the list of male first names,
- the list of random names (first and last),
- the list of colors,
- the list of cities,
- the list of random last names,
- the list of occupations,
- the list of typical company departments,
- the list of industries,
- the list of measure units,
- the list of ZIP (postal) codes, samples only not a complete list.

How to modify Value Library

The value library uses SQLite physical format as data storage. It can be modified by Value Library Manager or any compatible editor e.g. DTM Data Editor.

The variable is a way to customize a few rules at once. There are two levels of variables: local (prefix '#') and global (prefix '@').
The local variable can be used within single project only when global one is available for all projects.



Global Variables

Variable	Type	Defintition
@LEN	Constant	25
@Rq	Pattern	$RInt(10,25)

Name : Rq

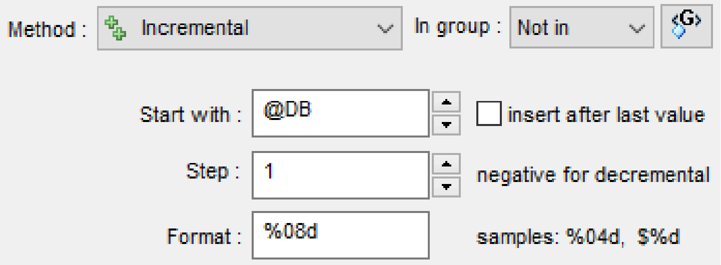
Type of the Variable : Pattern

Variable Definition : $RInt(10,25)

There is list of options, settings, and properties where variable can be used instead of constant:

- Minimum and Maximum value for "Random value" fill method
- Start and Step value for "Incremental" fill method
- A few Pattern Engine functions accept variables directly or via **$Vars** function call

To use variable just enter the full variable name instead of constant. For example:



Method : Incremental

In group : Not in

Start with : @DB

□ insert after last value

Step : 1

negative for decremental

Format : %08d

samples: %04d, $%d

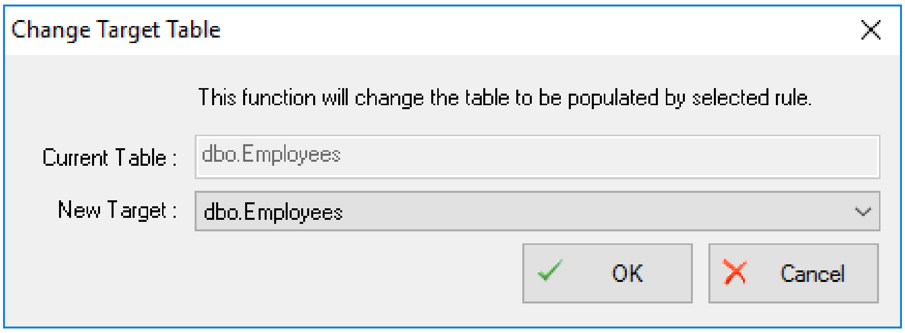
The export and import functions helps your team to share variables or even store them to version control system.

Data generator execution report

The execution report is HTML document with detailed information about project execution. It contains general information and detailed info for each executed rule. The user can view it with the built-in browser.

Change Table Function

This function allows the user to change target table for Data Rule.
The program does not perform compatibility check. Please be sure that new target table has the same structure as the original one.



This function will change the table to be populated by selected rule.

Current Table : dbo.Employees

New Target : dbo.Employees

Command line options

DTM Data Generator supports following command line switches:

-b - run BLOB loader with stored options at program startup.

-r - if present, run specified or recent generation project at program startup.

-q - quit application after project execution.

-p - switch Performance Mode on.

-@ - use custom connection profile*. Please note that you can use "Export One" button at the connect window to save connection profile to disk file.

-c - console mode*.

-s - silent mode: no output, logging only**.

* - supported by Enterprise and Professional versions only.
** - supported by Enterprise version only.

The console mode is a way to run the software when it doesn't open any dialogs and doesn't need any interference from the user. A project file for the console mode must be prepared and tested beforehand. The program will use the recent database connection in console mode.

Return Codes

The console mode returns integer result code to the Windows shell. There are code values:

- 0 - the project executed successfully
- 2 - internal lock, please rerun the software
- 4 - could not load predefined or provided project file
- 5 - could not restore connection
- 6 - project file is empty
- 8 - configuration error or trial period was expire
- 10- schema verification process fails, the database schema changes detected
- 12- execution canceled by user
- 14- bulk mode was configured incorrectly
- 16- complete with errors, at lease one row was rejected by database
- 18- rule initialization error

This mode enables you to integrate the product with the Windows task schedule system as well as to execute projects prepared beforehand according to the schedule.

Connection profile can be created by Export button at the Connect Window.

Also, you can use project name as a command line parameter.

Example: **DG.EXE -r d:\MyProjects\FillClients.dgp -@d:\acc.conprof**

Performance Tips

Use the 'unique' property of fields only when you really need it. The best alternative will be to create a unique index if you need the uniqueness of field values.

If possible, delete indexes and disable triggers for the table where test data will be inserted. After you add the necessary data, restore the previous state.

Very large lists of values (including those loaded from files) can considerably reduce the performance and require a considerable amount of memory.

Controlling the number of records inserted within one transaction will allow you to have the acceptable size of the transaction log and achieve the best DBMS performance.

Use -p command line switch or "default mode is Performance" in Settings. Please select this option with checked projects only.

See also: Performance issues and selecting optimal rules in DTM Data Generator.

Performance Mode

Performance mode is a special execution mode of the program. In this mode, the generator does not write detailed diagnostics to log file. Also, it increases the interval between console window updates.

You can be sure that performance mode is on when {PM} stamp shown in the main window title.

To switch this mode on or off you can use command line switch -p or related option.

Depend on project and database system this mode may be faster that default from 20-30% to 300-500%.

Format strings

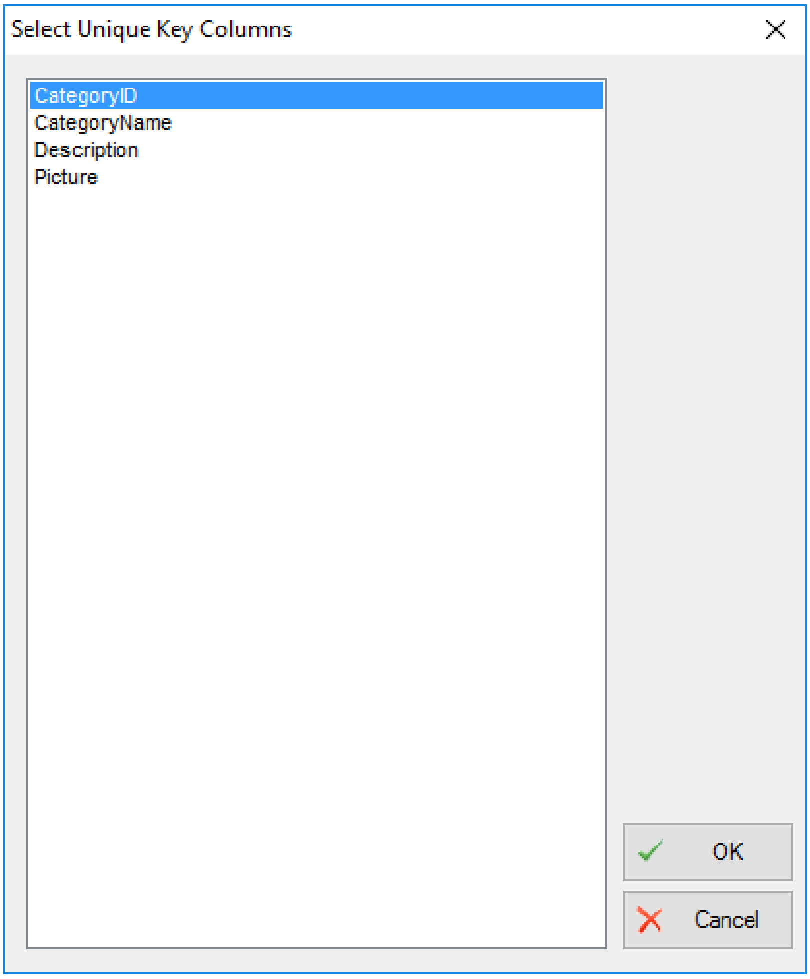
Data Generator uses C/C++-like format strings. A format string consists of its format specification and the rest of characters that are put into the result unchanged.
A format specification always starts from the % sign. If it is necessary to use this character as a character instead of a formatting element, it should be doubled.

The most useful format types are:

- **%d** - a signed decimal integer. You can use width for this field, for example, %5d. If you specify the width as %05d, the program will add non-significant zeros to reach the specified width.
- **%x** - a hexadecimal integer. Uses lowercase letters for hexadecimal integers. %X uses uppercase letters.
- **%f** - a value in the form dddd.dddd, where dddd is one or more decimal digits. It is possible to specify sizes in the form %5.2f (2 corresponds to the number of decimal digits here, while 5 is the total).
- **%s** - a string. '-' (minus) means alignment to the right if it is specified together with the width.

Select columns for search records

This dialog allows you to select the column(s) for search records. You can use it with 'Update' and 'Scramble' modes only if your source table has not Primary Key or if you want to search records by another column(s).


Select Unique Key Columns

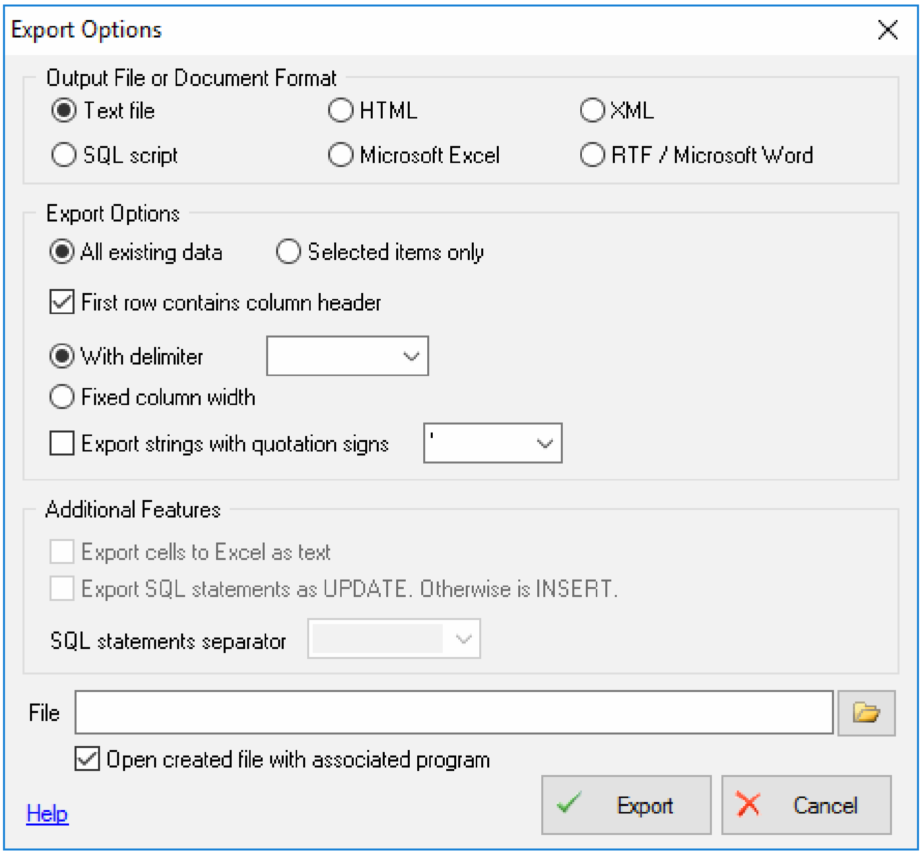
CategoryID
CategoryName
Description
Picture

Clipboard support, export features

Export results of Query Execution

Types of export:

- text file with separators or with fixed columns width.
- HTML file
- XML document
- RTF document
- set of SQL statements (INSERT or UPDATE)
- direct to Microsoft® Excel (installed Microsoft Excel required)



Export Options

Output File or Document Format

● Text file ○ HTML ○ XML

○ SQL script ○ Microsoft Excel ○ RTF / Microsoft Word

Export Options

● All existing data ○ Selected items only

☑ First row contains column header

● With delimiter

○ Fixed column width

☐ Export strings with quotation signs '

Additional Features

☐ Export cells to Excel as text

☐ Export SQL statements as UPDATE. Otherwise is INSERT.

SQL statements separator

File

☑ Open created file with associated program

Warning! Export for long binary data types (also known as BLOBs) is not supported.

Clipboard support

Copy selected text onto Clipboard	Ctrl-Ins, Ctrl-C
Cut selected onto Clipboard	Shift-Del, Ctrl-X
Insert text from clipboard into cursor position	Shift-Ins, Ctrl-V

SQL Library

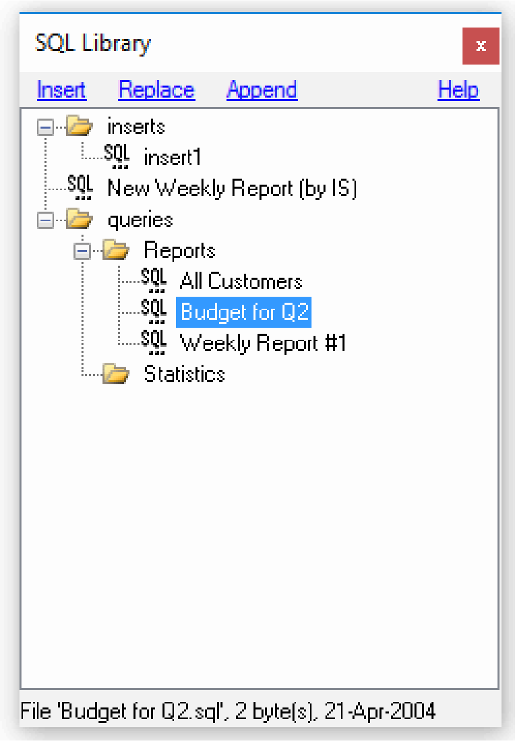
The SQL Library is a perfect way to organize or share your SQL scripts. The SQL Library is a hierarchy of files and folders. You can add your script to the library using Windows explorer. You can also save the script from DTM SQL editor into SQL library.

To access SQL Library click arrow "From Library" button at the main task properties page. Please note that this option is supported by Enterprise edition of the stress test tool only.

The default location of the library is "library" subdirectory in the product folder. For example, "C:\Program Files\DTM DB Stress\Library". You can change this value using settings dialog

The SQL script selected in the library can be saved using one of the following methods:

- **Insert** - insert the file at the current cursor position.
- **Append** - append the SQL file to the end of the script currently being edited.
- **Replace** - replace the current script.



File 'Budget for Q2.sql', 2 byte(s), 21-Apr-2004

Version Control Systems Support

The generator allows the user to operate with Version Control System as well as open or save files directly from the local or remote file system.

Visual SourceSafe

The software has predefined support for Visual SourceSafe by Microsoft. To operate with this VCS the user should define:

- VSS database information/location
- VSS project to be used
- user name and password for repository access
- Local folder to be used for temporary project file

Custom Version Control Systems

DTM Data Generator also supports custom VCS definition. In this case, the user has to define command line for most popular operations: check-in, check-out, add a new item, etc. Any defined command line can contain following macros:

- %USER% - user name for repository access
- %PASSWORD% - password
- %LOCAL-PATH% - folder for local file operations.
- %LOCAL-FILE% - file name for the operation.
- %COMMENT% - optional comment or note.

Important note: if you want to use system command or batch file, please add 'cmd.exe ' before actual command.

Hot Keys

Hotkey	Function or Option
Ctrl+A	Open "About" window
Ctrl+E	Enable or disable rule(s)
Ctrl+D	Move the rule down
Ctrl+H	Check for schema changes
Ctrl+L	View log file
Ctrl+N	Create new empty project file
Ctrl+O	Load Project file from the disk
Ctrl+R	Run the Project
Ctrl+S	Save Project file to the disk
Ctrl+W	Open Rule Wizard
Ctrl+U	Move the rule up
F1	Open help
F2	Open the connect window
F3	Close the database connection (disconnect)
F4	Save HTML report for the current project

How to...

Q: How to fill two linked tables with data?
A: Create a project with two data rules: the first one will fill in the parent (master) table and the second one will fill in the child (detail) table. At the same time, the program will automatically offer the method of filling based on FK (foreign key) values.
A: Run rule wizard and to select "create data generation rules for the selected tables automatically" options. The program will create necessary rules automatically.

Q: Are there any restrictions concerning the number of fields in a table or a file?
A: Yes, the program supports approximately 420-440 fields per table. If you need more fields, let us know and we will make a custom build for you.

Q: How to make the number of digits in the generated number fixed?
A: The easiest variant is to specify a range. For example, if you want integers to have 3 digits each, specify the range from 100 to 999.

Q: How to fill fields with values depending on other values in this or some other table?
A: Fill the column with random values and then use an update statement, specifying it as a script executed after the rule. During the rule execution, the program will fill out the table, while the script will set the values of calculated or dependent columns.
A: Use "by pattern" fill method.

Q: How to enter a date value into a field without specifying time?
A: Open the Settings page and specify the time format as an empty string.

Q: How to define constant value?
A: Use by list fill method with one value only.

Q: How to fill two columns (A and B) from one linked table coordinated?
A: Fill the first by SQL query like "select Column1,Column2 from LinkedTable". Next, create group consists of A and B columns.
A: Use "from table" fill method for both columns with required linked columns (Column1 and Column2 from the example above) and switch ON "use values from list sequentially". In this solution, data will be not really random but it is acceptable for most cases.

Runtime editions of the test data generator

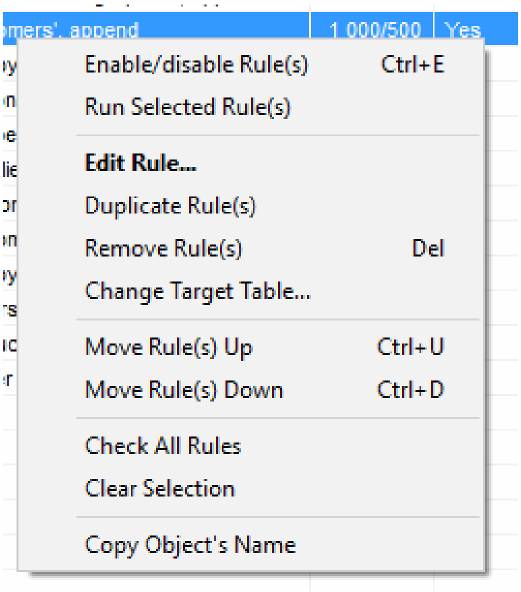
The runtime editions allow your team to run data generation process without full data generator. It helps to save money.

At the moment we offer two runtime products for the generator:

1. DTM Data Generator Runtime allows you to run precreated test data generation project.
2. DTM Data Generator Multiplatform Runtime is a way to run the project under non-Windows platforms (Linux/Unix, MacOS, etc).

Rules list context menu

The rules list has a context menu that can be accessed by the right-click inside the rules list:



Using this menu you can to:

- disable or enable the selected rule. Program skips disabled rules during project execution;
- run one rule currently selected;
- open the editor dialog box for the current rule;
- make a copy of the selected rule;
- remove the selected rule;
- move the selected rule up or down in the project.

How can I order DTM Data Generator software?

The software is available worldwide via the Internet. Secure online, mail/check and corporate purchase order options are available. For detailed information please click following link to open order page or copy http://www.sqledit.com/dg/order.html to your web browser.

If you have any payment questions feel free to contact the DTM Data Generator technical support at support@sqledit.com

Database utilities by DTM soft

DTM SQL Editor (www.sqledit.com/editor) is a set of powerful database management tools that allow you to achieve two goals - to have unified access to different types of databases and to have a set of solutions that makes processing your data easy. DTM SQL Editor gives database users, developers and administrators an ability to access different databases, whether desktop or client-server ones (provided you have ODBC driver installed). This is very convenient, since most organizations use several different types of databases installed and each stores data in different formats and with varying parameters. Having a program that can get data from various sources is often essential. Furthermore, in addition to letting you quickly switch between different data sources, DTM SQL Editor lets you see database schema and results of the query execution.

DTM Migration Kit (www.sqledit.com/mk) is a powerful yet simple data migration tool that comes in handy if you run multiple databases. Use it to import, export or migrate data between different data sources (ODBC, OLE DB, or Oracle Call Interface supported). The program is fully automatic and supports all popular database formats. Simple visual interface lets you set own transformation and flow control rules to give you added flexibility.

DTM Schema Reporter (www.sqledit.com/sr) is a reporting tool for database schema. The program creates reports in RTF, HTML, XML or plain text formats and supports all common database interfaces - ODBC, OLE DB, or even Oracle Call Interface. This utility helps technical writers and database administrators create a report of any complexity level within seconds. Also, you can alter table order in the report and manually add annotations to the individual tables.

DTM Data Generator (www.sqledit.com/dg) is a simple, powerful and fully customizable utility that generates data for database testing purposes. Currently, database developers and administrators often have to spend hours of dull work to create test data sets before examining database performance. This tool makes all this unnecessary by automatically creating database objects AND sets of SQL statements, if necessary.

DTM Data Editor (www.sqledit.com/de) is a data viewer and editor for database professionals who are tired of wasting their time on mundane tasks. The program uses form-based interface and works with any ODBC data source. SQL statements are generated automatically and can by modified later. For data that has foreign key - primary key relation, there are options to enter values manually or select them from a list, which is much faster.

DTM DB Stress (www.sqledit.com/stress) is a utility for stress testing the server parts of information systems and applications, as well as DBMSs and servers themselves. This tool allows you to create and configure a continuous set of requests to the server of the OLAP (query execution) and OLTP (adding, modifying and deleting data in the database) types. At the same time, the user can flexibly change both the number and the priority of this or that type of requests to a database or an application.

DTM Data Modeler (www.sqledit.com/dm) is a CASE tool for database developers that supports both forward and reverse engineering. It is an easy-to-use tool allowing you to work both with logical and physical data models in the form of an entity-relationship diagram. The product is intended for database architects and developers and works with data sources via the ODBC interface, which means compatibility with all modern DBMS. Along with basic model properties (sets of entities and relationships between them), the program allows you to create indexes and triggers on the physical level corresponding to the tables of the database that is modeled.

DTM Data Scrubber (www.sqledit.com/scr) is a set of intelligent tools for data verification (audit) and scrubbing (cleaning). Depending on user-defined rules and data properties, the program either creates a report about the actual state of affairs or performs database data correction.

DTM Data Comparer (www.sqledit.com/dcmp) is a visual tool for data compare and synchronization. The program successively views the contents of both tables basing on the order of ascending of unique key values and shows differences or creates synchronization script.

DTM Schema Comparer (www.sqledit.com/scmp) is a tool for database schemas comparison and synchronization. The comparison process supports tables, views, indexes, triggers and stored procedures. The visual representation of database schemas as a tree makes the comparison process more comfortable.

DTM Query Reporter (www.sqledit.com/qr) is a reporting tool for database query. This utility helps technical writers, developers and database administrators create a report based on database query within seconds.

DTM Schema Inspector (www.sqledit.com/si) is a database schema browsing and management tool that let you work with database schemas more effectively.

DTM DB Event (www.sqledit.com/event) is a database monitoring and management tool. This utility allows the user to define a few situations (events). For each event the user can define what the program should do if the event is occur.

DTM Flat File Generator. Easy to use tool that helps any developer or QA engineer to create test data file. It supports tab-delimited, CSV, fixed width and custom separated output files. The generator has powerful import and export file structure features.

DTM Test XML Generator. The tool is powerful generator for XML documents with structure defined by user and random but realistic data. More than 30 predefined generators with powerful pattern engine. The rich import XML structure options are available.

DTM Data Generator for Excel is a tool for text Excel spreadsheet population. Easy to use interface based on predefined generators, rich value library and high performance.

DTM Data Generator for JSON produces JSON files with defined structure in a bulk manner. Fast and easy structure editor and smart import options helps the user to generate test set in a few clicks only.

DTM Database Content Analyzer is a statistical tool for database content. It collects a few dozens of most interesting data: database objects size, value frequency, clusters, etc. This tool replaces and extends "Statistics" report of obsolete versions DTM Schema Reporter.

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Demo and Full versions

What differences between the demo and full versions of the DTM Data Generator?

General functions

- Demo version allows users to generate not more than 50 rows per single table (objects, tables, etc).
- Demo version disallows user to create more than 15 rules per project (except rule wizard output).

Supplemental functions

- Data Model (ER) viewer partially replaces column names to DEMO string.
- SQL console partially replaces result values to DEMO string.

No other demo limitations are present except nag-screen at program shutdown.

SQL Syntax Mapping Function

There are legacy or custom ODBC drivers with non-standard SQL syntax. Our software supports syntax mapping for ODBC connections. This function allows users to replace some SQL keywords to another.

For example, your data source requires QUIRY keyword instead of standard SELECT.

The syntax mapping uses text file with predefined name "syntax.map". It should be located in the same directory as the software binary files (executable and DLLs).

It contains one line per map[*] :

```
SELECT=QUERY
```

[*] - ';' at the begin of the line means comment, extra spaces about '=' are not acceptable.

Program Installation

To run installation program:

- Open the windows Start menu and select "Run" item
- Select or enter installation file name and path (dg.exe or dg_d.exe)* and click OK

* - professional and enterprise editions of the tool may have another suffix.

Notes:

- Please be sure that existing version of the tool is not running when you install a new version.
- We recommend to uninstalling old version of the DTM Data Generator before new version installation.
- Installation by administrator for another user is supported for most environments.

Uninstall the Software

The Uninstall feature removes all installed DTM Data Generator components and all records in the Windows registry made by the installation script. You can uninstall this program by selecting the "**DTM Data Generator**" item in "**Add/Remove Programs Dialog**" in "**Control Panel**".

Another uninstallation way is to run "unins000.exe" from the product's folder directly.

Important! Uninstall feature of the program does not remove files and objects created by users such as configuration files, registry records etc.

How to upgrade your copy of DTM Data Generator?

The user can refer to "Check for Update" features to get information about available updates.
Please contact our support staff at support@sqledit.com to upgrade commercial version of the tool.

Demo version is available for download free of charge.

When you upgrade your copy of DTM Data Generator please send us the following information:

- You name, company name and how to contact you
- Payment information (at least "ORDER No" and "Date")

Technical support

If you have some question or unusual problem feel free to contact the DTM Data Generator technical support at support@sqledit.com

When you contact technical support, you should be prepared to provide the following information:

- DTM Data Generator version (you can find this information from About menu item of Help menu).
- Type and version of the ODBC or IDAPI driver or OLE DB provider.
- DBMS version and operating system version (including service pack version, if applicable).
- DTM Data Generator Log file.
- A description of what you do before the problem occurs.
- Error messages you see when the problem occurs.
- Your name, company name and how to contact you.

See Also: log file

Log File

Log file

When running the program, you have to select one of menu items from "**Tools->Log file**" in order to view or truncate your Log file. The log file contains the detailed description of any errors and other events that occurred while processing script.

Default log file location is product's directory and the name is ERROR.LOG. When the user has no enough permissions DTM Data Generator saves log to typical path like C:\Documents and Settings\<username>\Application Data\dg.log or C:\Users\<username>\AppData\Roaming\dg.log

The log file is a text file that contains three type of records:

1. The software product identification block: product name version and operating system information.
2. Error records: wrong SQL statements, exceptions, etc.
3. Notification and statistics.

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Glossary

Database catalog - The collection of system tables, tables that store metadata about that specific database.

Database record - one row in a table (table can be a result of SQL-query).

Database schema - logically connected, usually owner-based, set of DBMS objects (tables, views, procedures etc).

DBMS - database management system.

DBMS connection - the fact that both client and DBMS server have signed a contract and ready to query and data communications.

Drag-n-drop - the file manipulation technique when the mouse is used to move the file from the place of storage to the program, which performs processing.

SQL language - the declarative language used to manipulate the data and its' structure in the modern DBMS and their client applications.

IDAPI - Integrated Database Application Program Interface, unified DBMS access interface.

OCI - Oracle Call Interface, access interface for Oracle Server.

ODBC - Open Database Connectivity, unified DBMS access interface.

Metadata - information about data. See also: database schema

SQL statement - single SQL operator having the complete role in a data manipulation script.

SQL-server - program or program complex, which is able to execute the SQL-queries.

Step-by-step quick start: append data

1. Run the program and setup connection for your database.
2. Press "Add Data Rule" button to create new rule.
3. Select table from drop-down list.
4. Save the rule and run it using "Run All" button.

Optional steps. You can to:

- change number of rows to be generated and transaction size.
- change fill method or method properties.
- view sample data with preview tab.
- create prologue and epilogue SQL scripts for the rule.
- specify custom output files for text and SQL output.
- define short text note for created rule. The program shows is note in the rule list.

Step-by-step quick start: replace mode

1. Run the program and setup connection for your database.
2. Press "Add Data Rule" button to create new rule.
3. Change mode to "Replace" with related drop-down menu.
4. Select required table from drop-down list.
5. Save the rule and run it using "Run All" button.

Optional steps. You can to:

- create prologue and epilogue SQL scripts for the rule.
- change number of records to be generated and transaction size.
- change fill method or method properties.
- view sample data with preview tab.
- specify custom output files for text and SQL output.
- define short text note for created rule. The program shows is note in the rule list.

Step-by-step quick start: scramble table

1. Run the program and setup connection for your database.
2. Press "Add Data Rule" button to create new rule.
3. Change mode to "Scramble" with related drop-down menu.

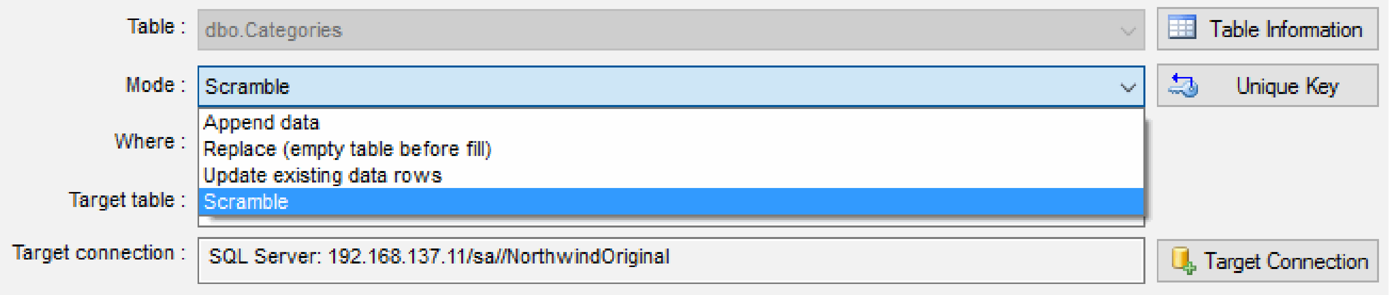


Table : dbo.Categories

Mode : Scramble

Where :

Target table :

Target connection : SQL Server: 192.168.137.11/sa//NorthwindOriginal

4. Select source table from drop-down list. If this list is empty you should check schema/owner name in the Connect Window. There is important that schema/owner name is case sensitive.

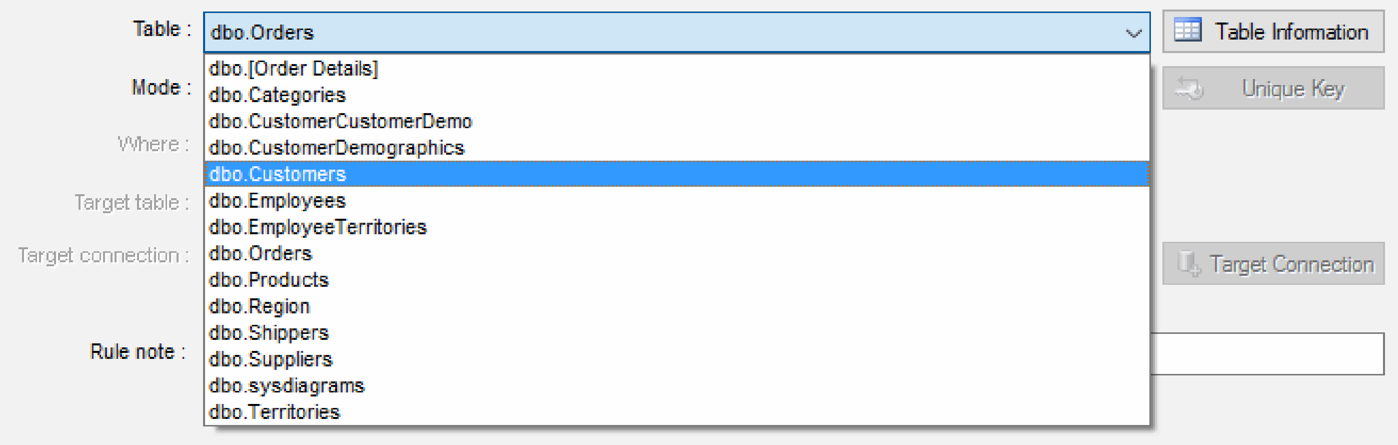


Table : dbo.Orders

Mode :

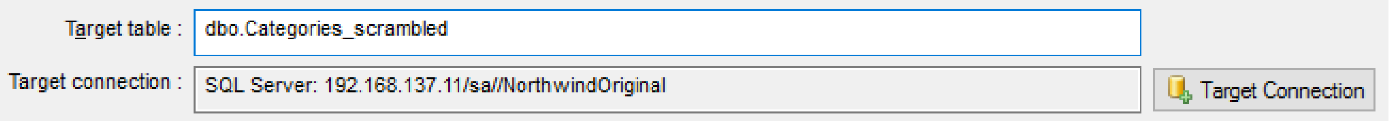
Where :

Target table :

Target connection :

Rule note :

5. If the source table has no Primary Key, you should specify unique key manually using "Unique Key" button near table name.
6. Enter name for a table where scrambled data be saved. Please note that target table should not exist except "Recreate table for scramble mode" option in the Settings Window is turned ON.



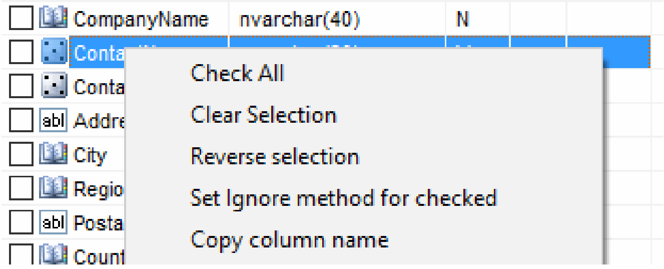
Target table : dbo.Categories_scrambled

Target connection : SQL Server: 192.168.137.11/sa//NorthwindOriginal

7. Specify database where target table will be created with "Connection for Target" button near target table name. By default the program will save created or recreated table into the database specified at the project properties window. Please refer to "Default Target Database" option.
8. Save the rule and run it using "Run All" button at the main window.

Optional steps. You can to:

- change transaction size for scramble operation. Default value can be specified in the Settings Window.
- enter WHERE clause. The program will scramble only rows corresponding with entered condition.
- change fill method or method properties. By default the program will scramble all columns except identity and auto-incremental. You should change fill method to "Ignore" to save original values. The simplest way to do it is check required columns using check-boxes in the columns list and open local menu with right mouse button in the list:



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- view sample data with preview tab.
- create prologue and epilogue SQL scripts for the rule.
- define short text note for created rule. The program shows is note in the rule list.
- specify custom output files for text and SQL output.

Step-by-step quick start: update table

1. Run the program and setup connection for your database.
2. Press "Add Data Rule" button to create new rule.
3. Change mode to "Update" with related drop-down menu.
4. Select table to be updated from drop-down list. If this list is empty you should check schema/owner name in the Connect Window. There is important that schema/owner name is case sensitive.

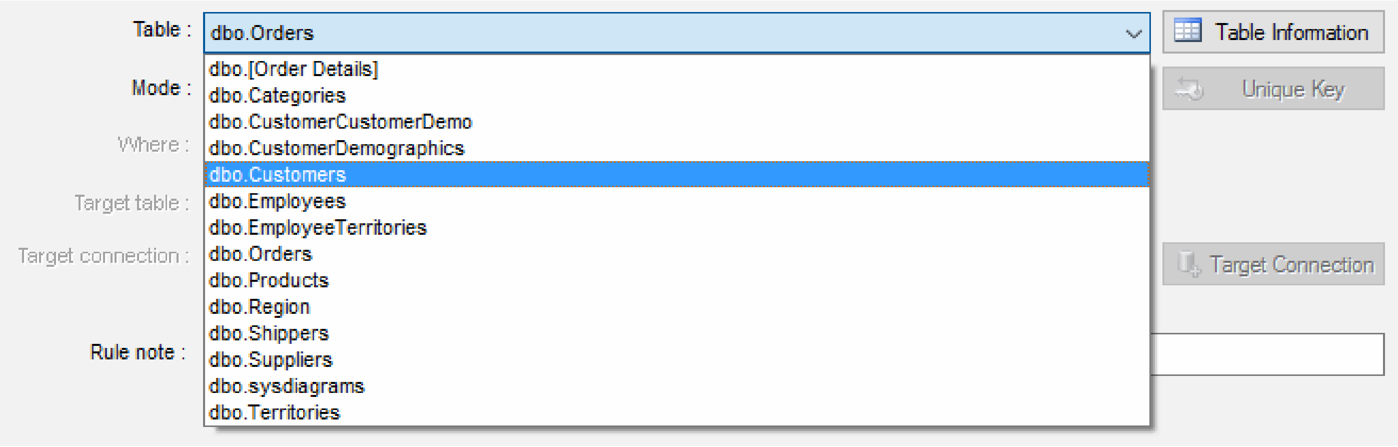
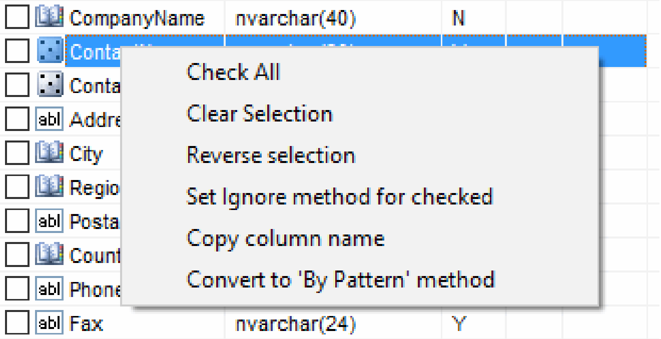


Table : dbo.Orders

5. If the source table has no Primary Key, you should specify unique key manually using "..." button near table name.
6. Save the rule and run it using "Run All" button.

Optional steps. You can to:

- change number of rows to be generated and transaction size. Default value can be specified in the Settings Window.
- enter WHERE clause. The program will update only data rows that correspond with entered condition.
- change fill method or method properties. By default the program will update all columns except identity and auto-incremental. You should change fill method to "Ignore" to save original values. The simplest way to do it is check required columns using check-boxes in the columns list and open local menu with right mouse button in the list:



- view sample data with preview tab.
- create prologue and epilogue SQL scripts for the rule.
- specify custom output files for text and SQL output.
- define short text note for created rule. The program shows is note in the rule list.

Step-by-step quick start: populate database

1. Run the program and setup connection for your database.
2. Press "Rule Wizard" button at the program toolbar or to select related menu item.
3. Select second mode "...for selected tables" at the first page.
4. Check required tables at the second page.
5. Review or change default rule settings at the third page.
6. Run created project using "Run All" button.

Optional steps. You can to:

- add Clear rule at the first page.
- remove old rules from the project with checkbox at the first page.
- specify custom output to text, SQL or XML file(s).