xINvisionQ.Studio User Guide



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www.xinvisionq.com

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xINvisionQ.Studio

Official User Guide

Introduction

This guide provides information on installing and working with xINvisionQ.Studio.

About this Document

This document is intended for all new users. It covers installation instruction, a guide of using xINvisionQ.Studio, and the appendices also give some additional information.

Document Organization

- Chapter 1 provides an overview of xINvisionQ.Studio.
- Chapter 2 provides information on installing xINvisionQ.Studio.
- Chapter 3 provides information on using xINvisionQ.Studio.

Chapter 1. Overview of xINvisionQ.Studio

This chapter provides overview of xINvisionQ.Studio, including:

1. What xINvisionQ.Studio is.
2. What xINvisionQ.Studio can do.

What is xINvisionQ.Studio

xINvisionQ.Studio is a powerful, yet easy to use data science tool. xINvisionQ.Studio is your all-in-one cutting-edge studio for database management, code generation, and forecasting. xINvisionQ.Studio can connect to Microsoft SQL Server, Oracle, MySQL and PostgreSQL; generate code for Python, C#, Java, and more; produce effective forecasts for any data with our proprietary evolutionary algorithm. Whether for data in retail, financial, medicare, transportation, logistics, and many more xINvisionQ.Studio is your one stop tool for you to hook up all the databases, generate code, and get the forecasts for all that data!

You don't have to be a data scientist, professional programmer, or have a degree in statistics or mathematics, with xINvisionQ. You'll be a data analyst, coder, and forecaster once you fire up xINvisionQ.Studio!

What xINvisionQ.Studio can do

xINvisionQ.Studio offers:

1. Database Management
    - Supports for Microsoft SQL Server, Oracle, MySQL and PostgreSQL
    - An Universal Database Server Explorer
        a) Convenient Server Browsing
        b) Powerful Grid-Based Data Editor
        c) Built-in Code Generators
    - An Universal SQL Editor:
        a) Syntax Highlighting
        b) Code Completion and Parameter Information
        c) Run Stored Procedures using 'EXEC' Key word
2. Data Forecast
    - Produce effective forecasts for any data with our proprietary evolutionary algorithm
        a) Generate a function if dataset is "clean"
        b) Generate a probabilistic decision tree if dataset with "noise"
    - Export
        a) Forecast dataset
        b) Forecast diagram
3. Code Generation
    - Visual Model Builder
    - Code Generation Wizard
    - Template-Based Model-Driven Code Generation Engine

Chapter 2. Getting Started

This chapter provides information on installing xINvisionQ.Studio, including

1. Prerequisites.
2. System Requirements.
3. Installing xINvisionQ.Studio.

Before Your Begin

Download xINvisionQStudio.msi from http://www.xinvisionq.com

Prerequisites

Ensure the following prerequisites are met prior to install the xINvisionQ.Studio:

- Microsoft .NET Framework 4.8 is required.
- Microsoft Windows Installer 3.0 or newer
- GraphViz 2.1.7 or newer

System Requirements

This xINvisionQ.Studio is compatible with the following operating systems:

- Microsoft Windows 10/11

Installing the Program

xINvisionQ.Studio is distributed as Windows Installer package; you will need Windows Installer support on your system, which is available at

http://www.microsoft.com/downloads/details.aspx?familyid=5FBC5470-B259-4733-A914-A956122E08E8&displaylang=en

Run xINvisionQStudio.msi from Command Prompt or Windows Explorer to install the software.

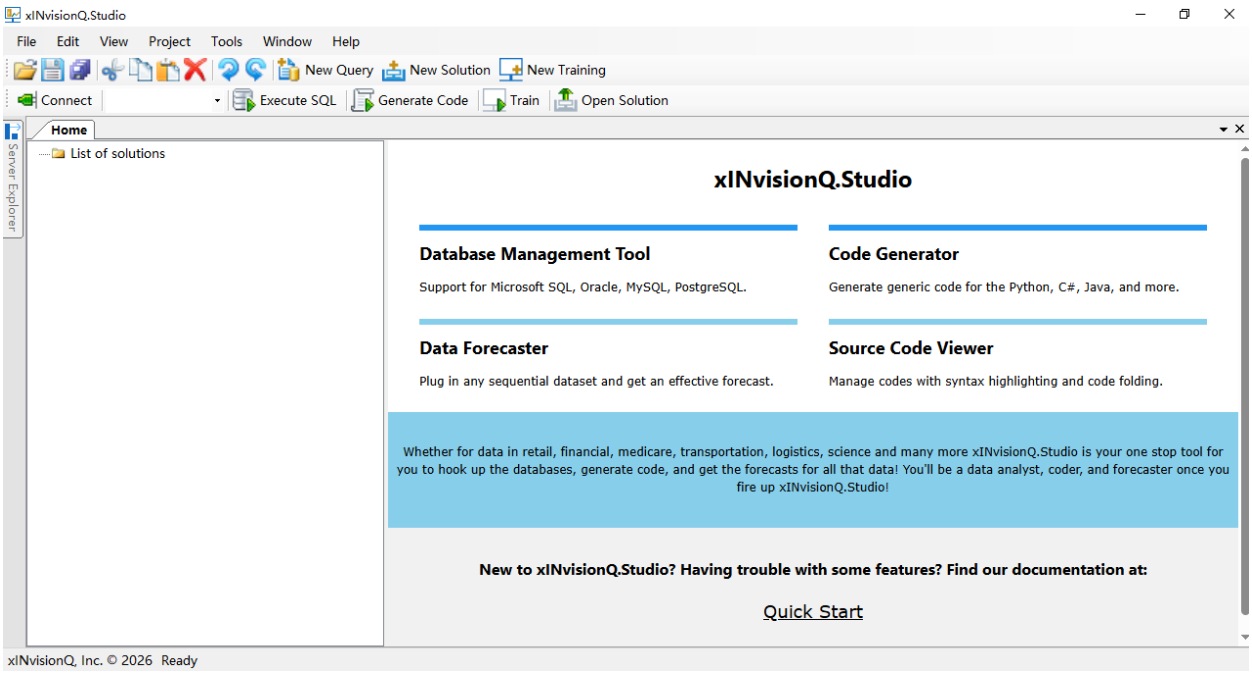
Chapter 3. Using xINvisionQ.Studio

This chapter describes how to use xINvisionQ.Studio, including:

1. Overview
2. Using Server Explorer
    a. Connect the Database Server
    b. Edit the Data
    c. Generate Database Report
    d. Generate Entity-Relationship Diagram
    e. Generate the Code
    f. Customizing plug-in Generator Editor
    g. Using Universal SQL Editor
3. Using Solution Explorer
    a. Creating Generator Project
    b. Using XEML Model Builder
    c. Creating Machine Project
    d. Forecasting Data

Overview

Upon opening xINvisionQ.Studio, the menu bar and toolbar is on the top, home window is in the center of the screen, Server Explorer is tabbed on the left hand side; once a new solution is created or upon opening an existing solution the Solution Explorer will pop up on the right side.



To pull up the quick start click the **Quick Start** button at the bottom of the home page, and to access the User Guide and to learn more about xINvisionQ.Studio navigate to the **Help**-> **User Guide** drop down menu on the menu bar at the top.

Server Explorer

The Server Explorer allows you to connect to database, explore objects in connected database, edit data in grid-based data editor, export schema metadata and generate codes; you can pin it to the left side by clicking the pin button at the top.

Solution Explorer

The Solution Explorer is where you can create a generator project for code generation and a machine project for forecasting; you can pin it to the right side by clicking the pin button at the top.

Workbench

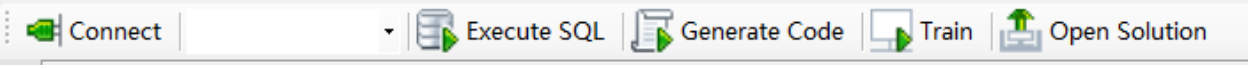
The central panel is the main workbench where you can edit/save data, query the data, and forecast data. xINvisionQ.Studio is a multiple-workspace application where you can manage all your workspaces in the workbench, and you can have more than one open workspace at a time and switch between different workspaces frictionless.

Using Server Explorer

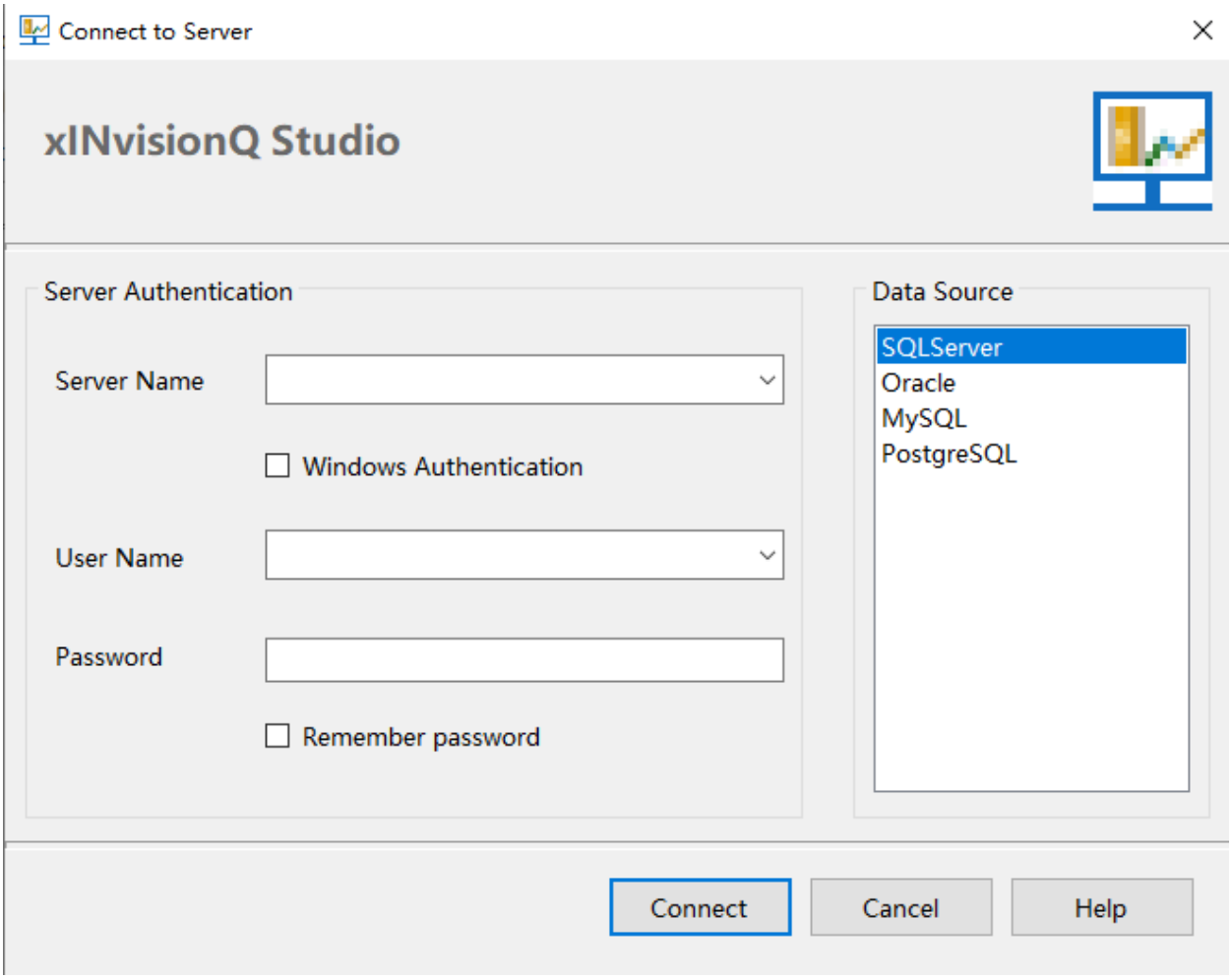
Object tree in the Server Explorer allows you to explore objects in connected database, edit data at grid-based data editor, export schema metadata and generate the code using various code generators.

Connecting Database

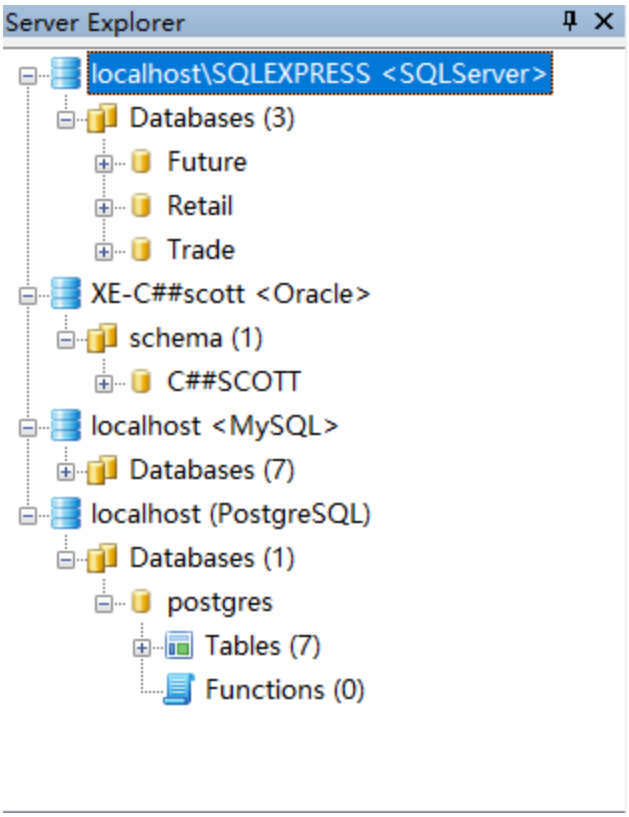
Click **Connect** button located on the toolbar to connect to the database.



In addition, you may use **Tools > Connect** to connect to the database.



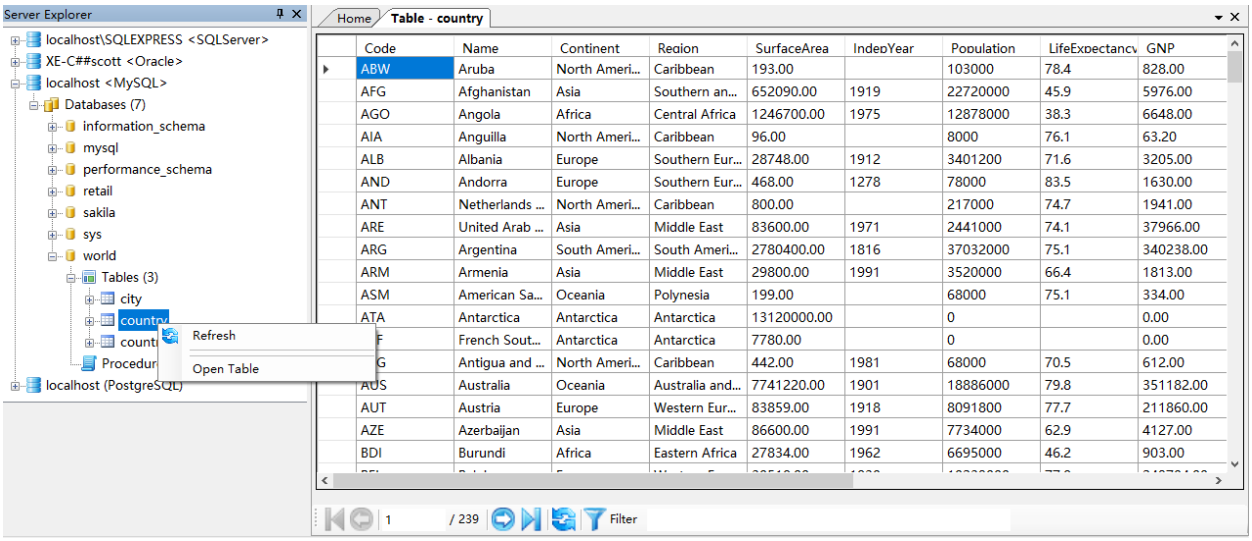
Please input Server Name, User Name and Password to connect to the database. After successfully signed in, the xINvisionQ.Studio will remember all authentication information and there is no need to enter the information next time if you check the “Remember password” checkbox.



You can view all the connected databases in Server Explorer for seamless database management – i.e. SQL Server, MySQL, Oracle, PostgreSQL.

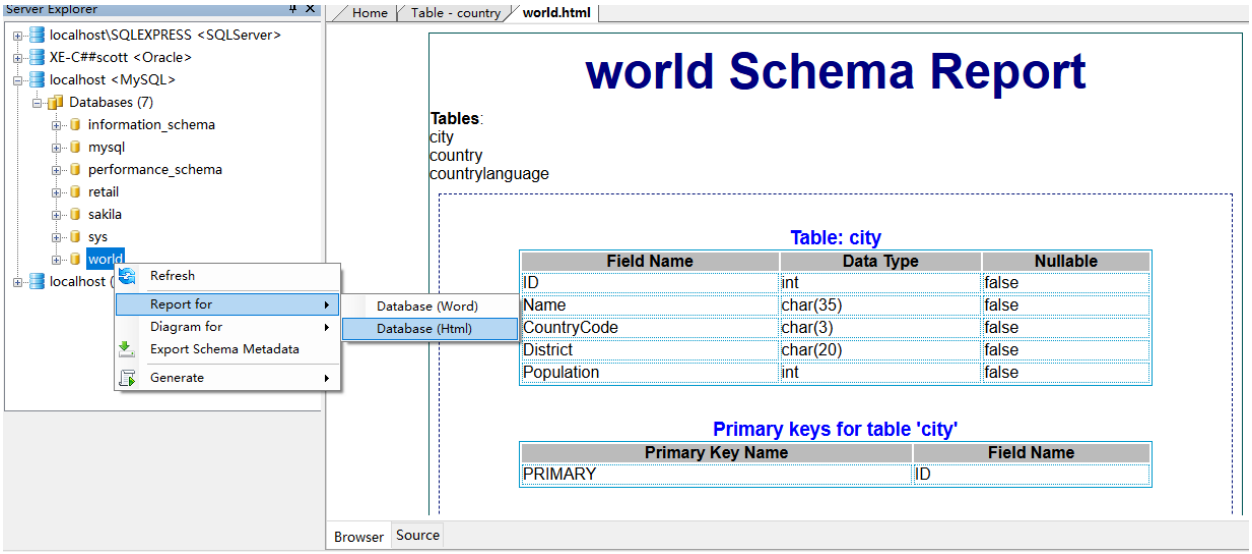
Editing Data

Right-Click table node, and then click **Open Table** menu item to open the table data at a grid-based data editor to add, update, delete and filter table data.



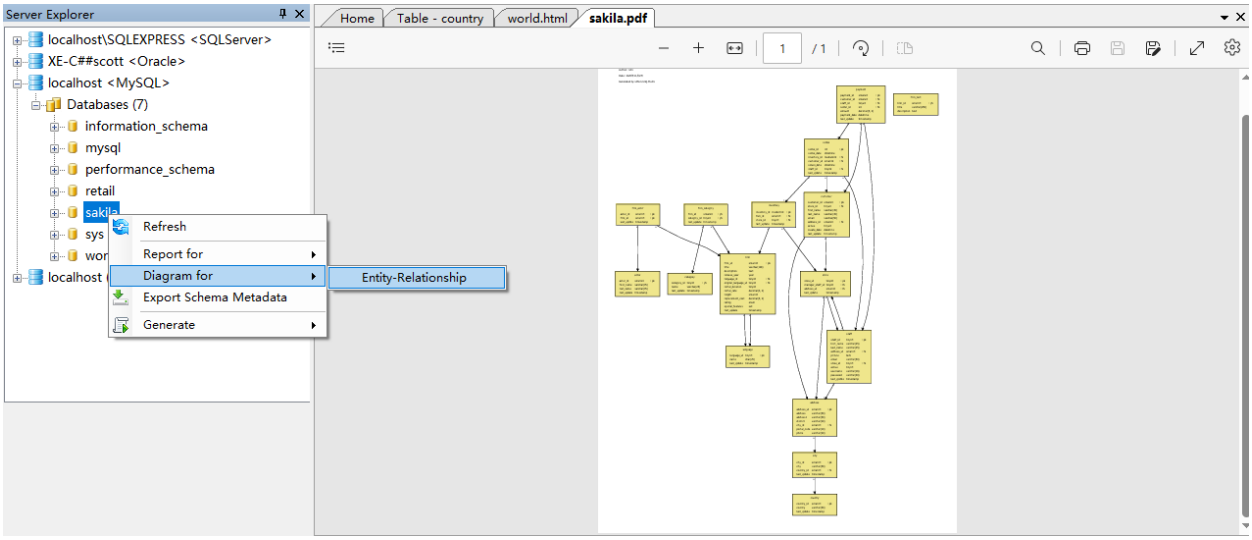
Generate Database Report

Right-Click database node, and then click **Report for -> Database (Html)** menu item to generate database report in html format, you can also generate database report in Word format by click **Report for -> Database (Word).**



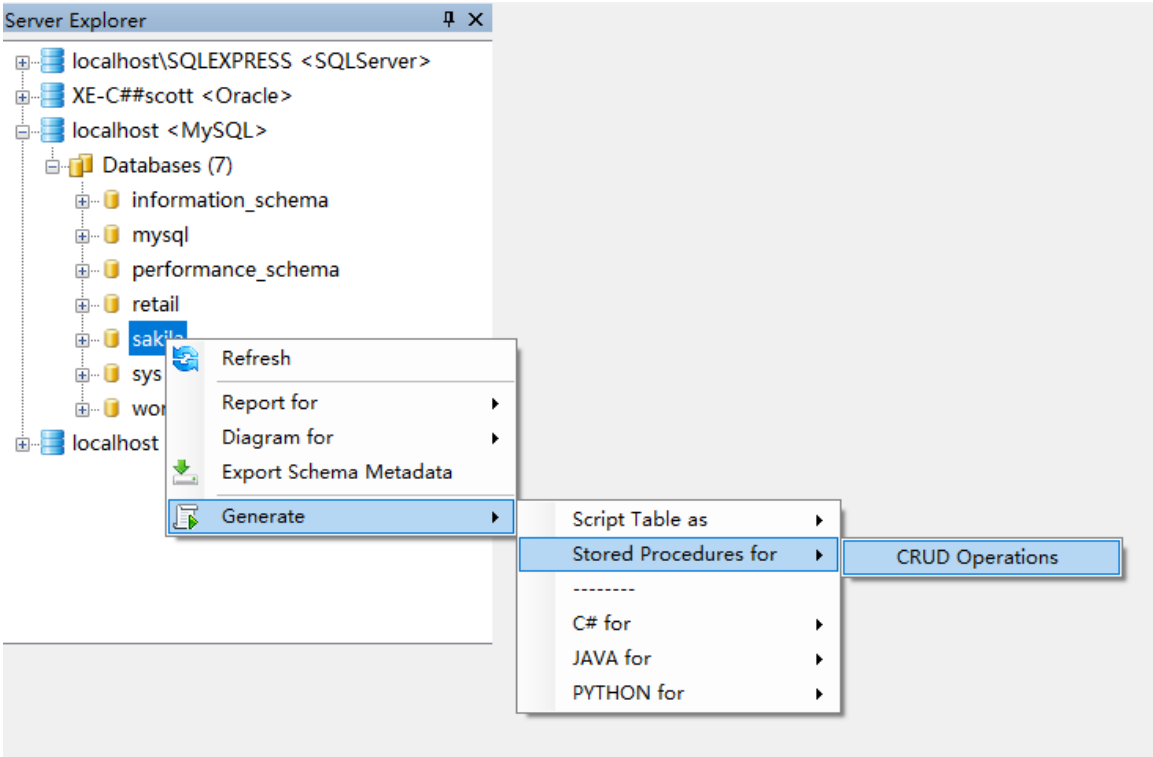
Generate Entity-Relationship (ER) Diagram

Right-Click database node, and then click **Diagram for -> Entity-Relationship** menu item to generate ER diagram in PDF format.



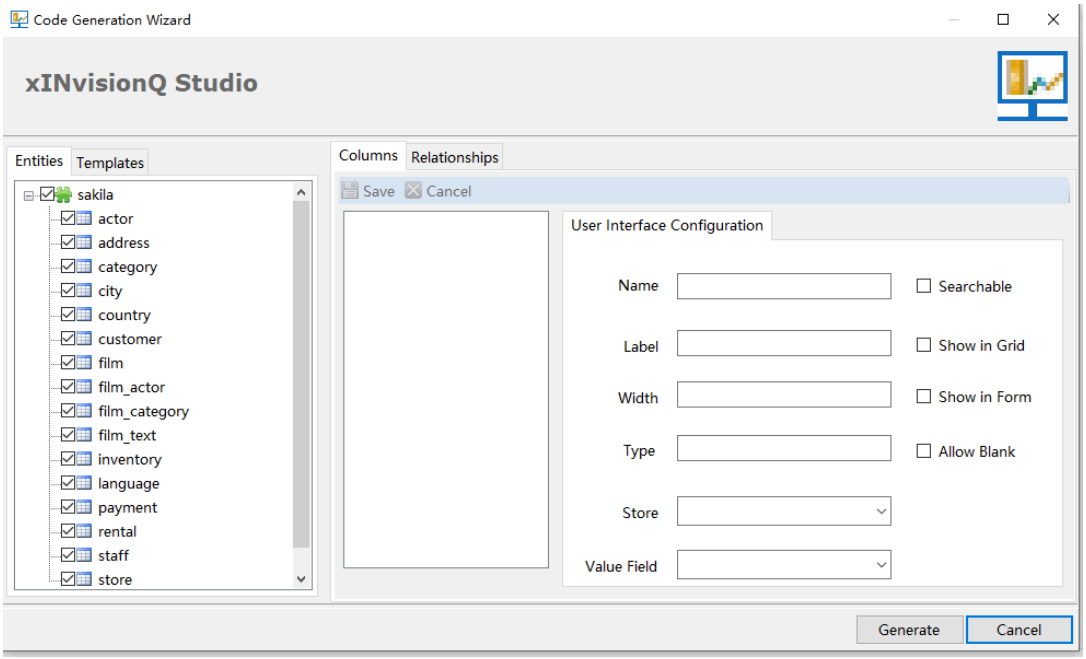
Generate Code

Right-Click database node and context menu appears.



The following describes the process steps of generating code:

Step 1 Click **Generate -> Stored Procedures for -> CRUD Operations** to open the code generation wizard.



This step allows you to select the table(s):

- Check “checkbox” of database name - Sakila to select all tables.
- Uncheck “checkbox” of database name - Sakila to un-select all tables.
- Exclude any database table by uncheck it from tree view.

This step also allows you to configure the attributes of ‘ui’ tag for each column to generate complex user interface.

Click **Generate** button on Code Generation Wizard to generate the code.

.xINvisionQ.Studio comes with five built-in code generators for you to utilize, including Script Table as Create to, Stored Procedures for CRUD operations, C# for Data Transfer Object, JAVA for Data Transfer Object and PYTHON for Data Transfer Object - you can also plug-in your own customized code generators as well.

Customizing plug-in Generator Editor

xINvisionQ.Studio uses Entity Markup Language to define the models and uses different XSLT templates to translate the models into multiple artifacts in the area of user interface, business logic, data access, and more. xINvisionQ.Studio is Model-Driven and Template-Based code generator that said you can always customize the templates to generate the code you want based on one specification (XEML model). Since the XEML model is actually XML documentation, the XSLT templates are used to create any number of output files. This XML/XSLT based code generation approach gives you a great amount of feasibility to customize the output format, and allows you to modify the XSLT style sheets to generate the code you want.

To plug-in your own customized code generators to generate code directly from the database server, create a “code generator” (XSLT Style Sheet) first and then add it to the template collection in the Template Editor.

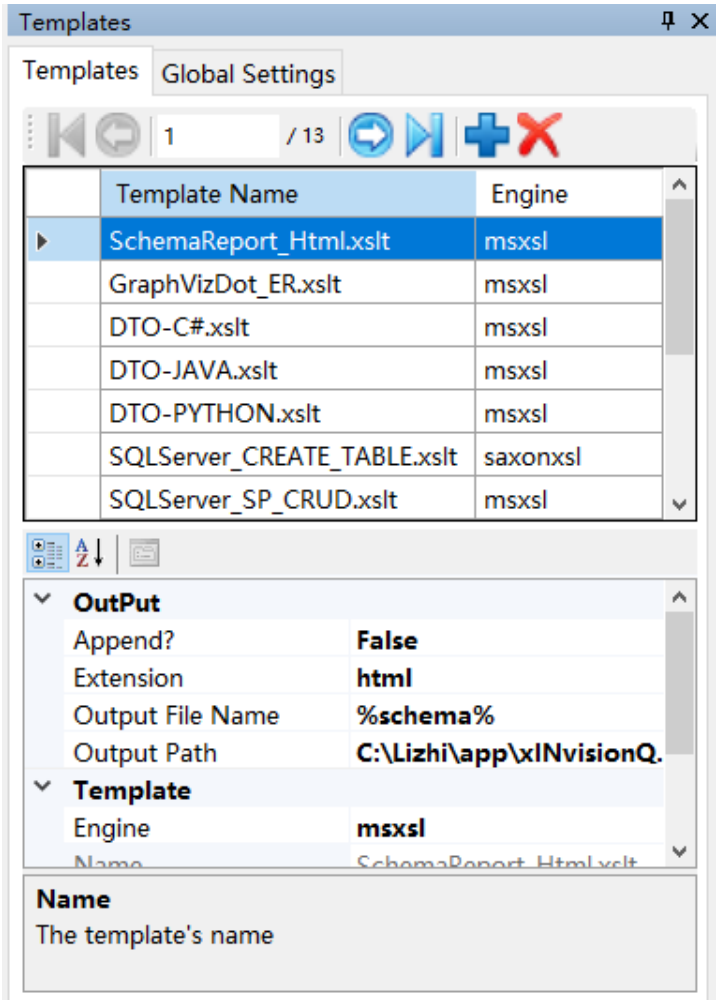
Using Template Editor

Click **View->Template Editor** button on menu bar to open Template Editor at right panel.

The Template Editor allows you to configure XSLT template’s properties using Property Window:

- **Append**: “True” to append the text to existing file; “False” to overwrite it.
- **Extension Name**: The extension name for the generated file.
- **File Name**: The output files name and the format: Prefix - %entity% - Suffix.

- **Output Path**: The directory that the generated code file will be saved at. Click  button to open Browser Folder to change the output directory.
- **Engine**: “msxsl” to use Microsoft XSLT 1.0 engine; “saxonxsl” to use Saxon XSLT 2.0 engine.
- **Tag**: “entity” tag for processing each entity; “schema” tag for processing all entities.



Using Generator Editor

Click **View->Code Generator** button on menu bar to open Code Generator at left panel.

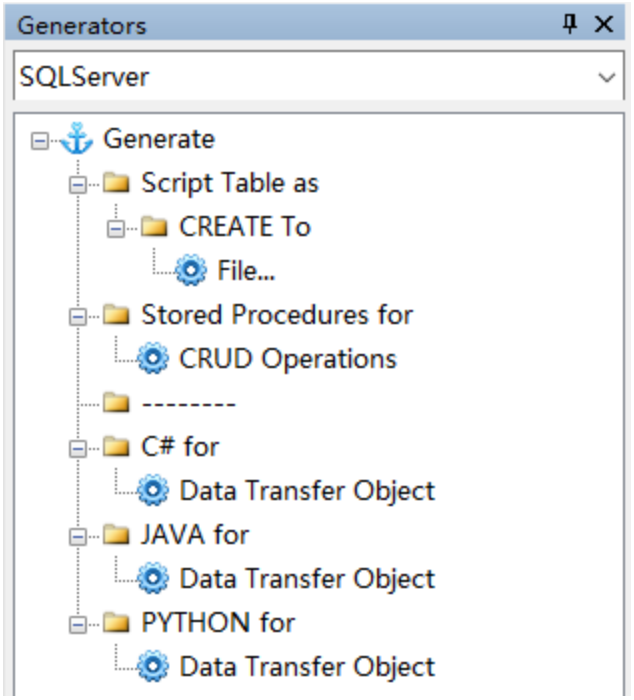
The Generator Editor allows you to view/edit/create code generators.

Step 1: Select a data source from the combo box

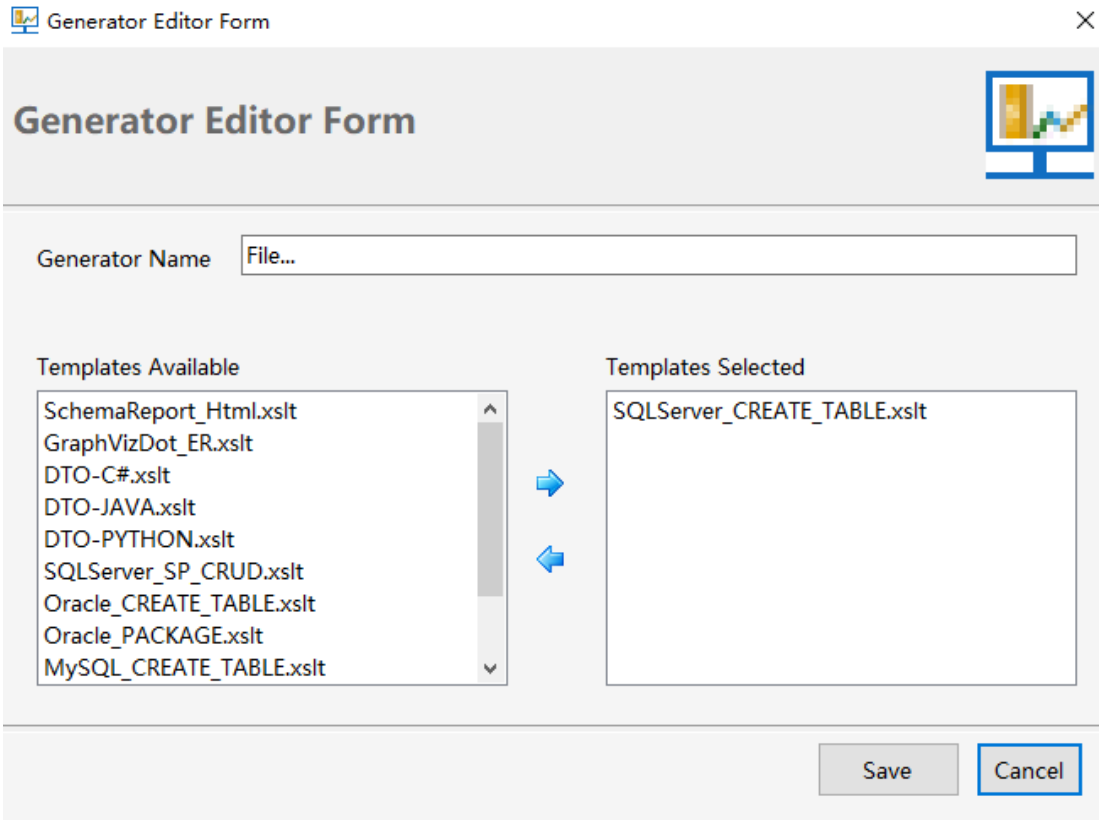
Step 2: Right click the node you want to create/edit the generator

Step 3: Click ‘New’ or ‘Edit’ menu item

A Generator Editor Form will pop-up:



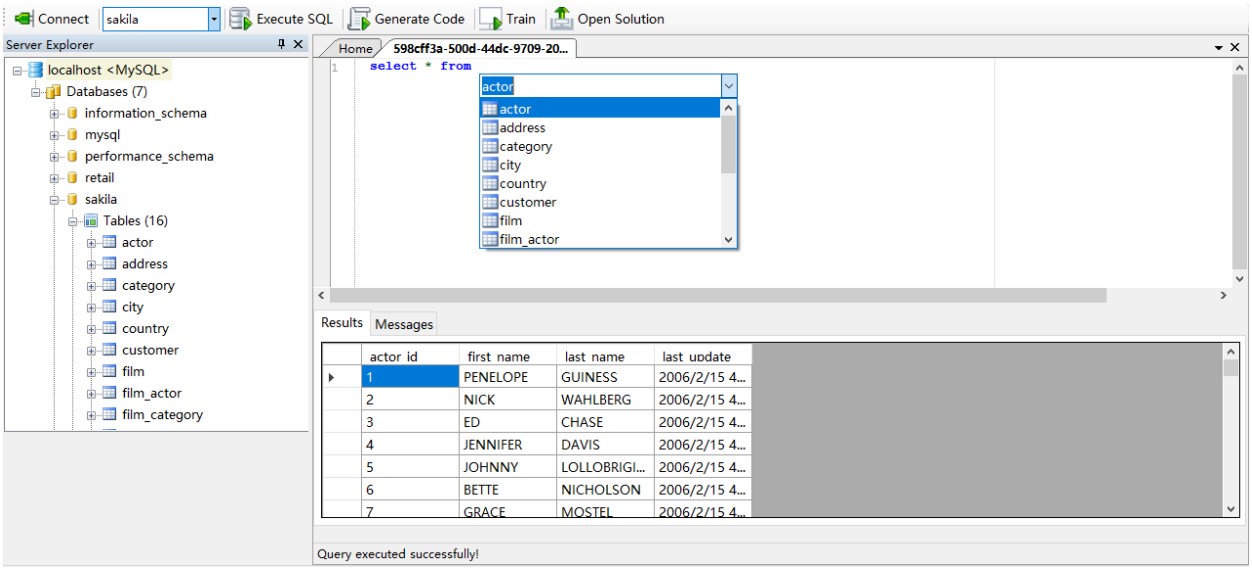
Input/edit the name of code generator and pick up the template(s) from the 'Templates Available' list box, and then added to 'Templates Selected' list box. You can add new templates using Template Editor. Click 'Save' button when finished.



Using Universal SQL Editor

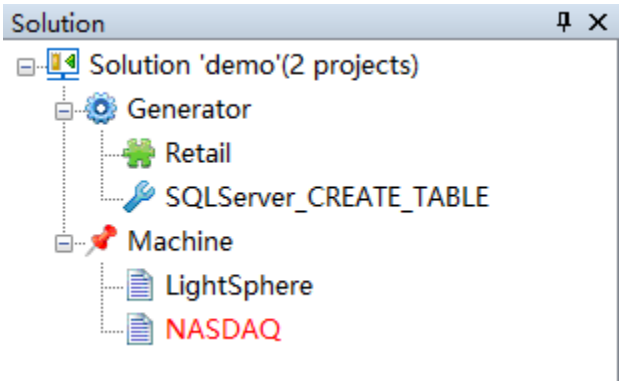
By clicking the **New Query** button located in the upper toolbar you can open the **SQL Editor**, in which once successfully connected to the database server, you can also open the **SQL Editor** by clicking **Tools - > New Query**.

Selecting the database from the dropdown menu listed at the Combox adjacent to the Connect button in the Toolbar allows you to use SQL language to run the script to query, insert, update, and delete data – where the query result will be shown in the bottom panel. xINvisionQ.Studio also provides a unique powerful auto-complete feature that assists you when writing any SQL script.

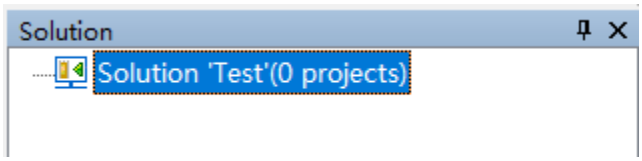


Using Solution Explorer

The Solution Explorer is where you can create a generator project for code generation and a machine project for forecasting.

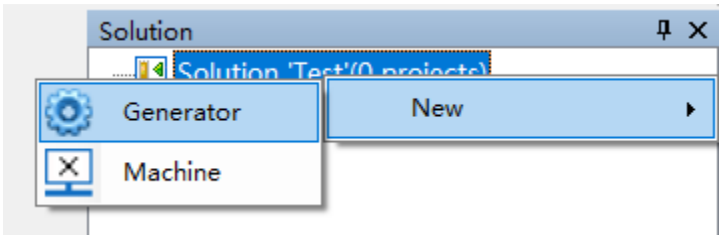


You can create a new solution by clicking the **New Solution** button in the upper toolbar – once it displays in the panel on the right hand side that it has been successfully created; you can also create a new solution by clicking **Project - > New Solution**.

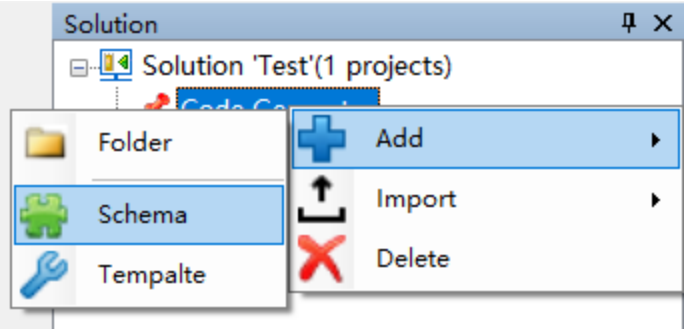


Creating a Generator Project for Code Generation

Right click the solution to bring up the context menu. Hover over **New** then click the **Generator** button to create a new **Generator** project.

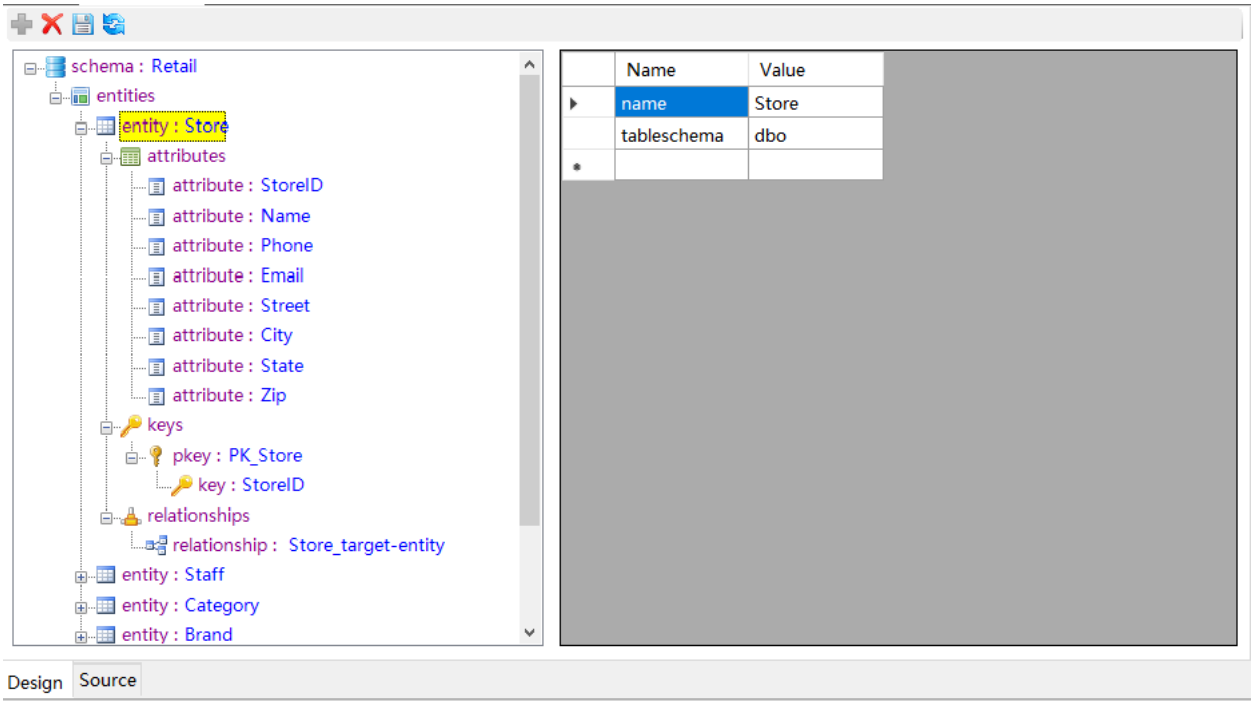


In order to start generating code, you first need to create a model by right clicking the 'Code Generator' project which will bring up the context menu. Then hover over **Add** and click the **Schema** button to create a new model; you can also import the existing model by hovering over **Import** then click **Schema** button.



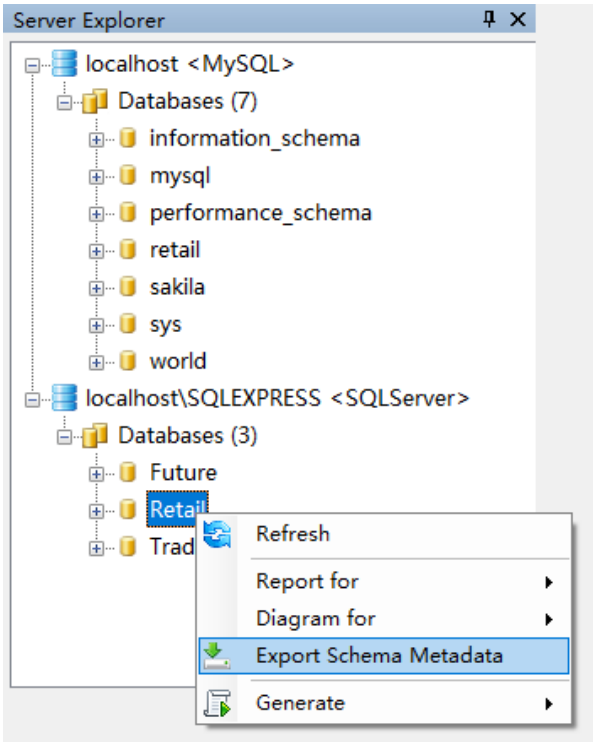
Using Model Builder

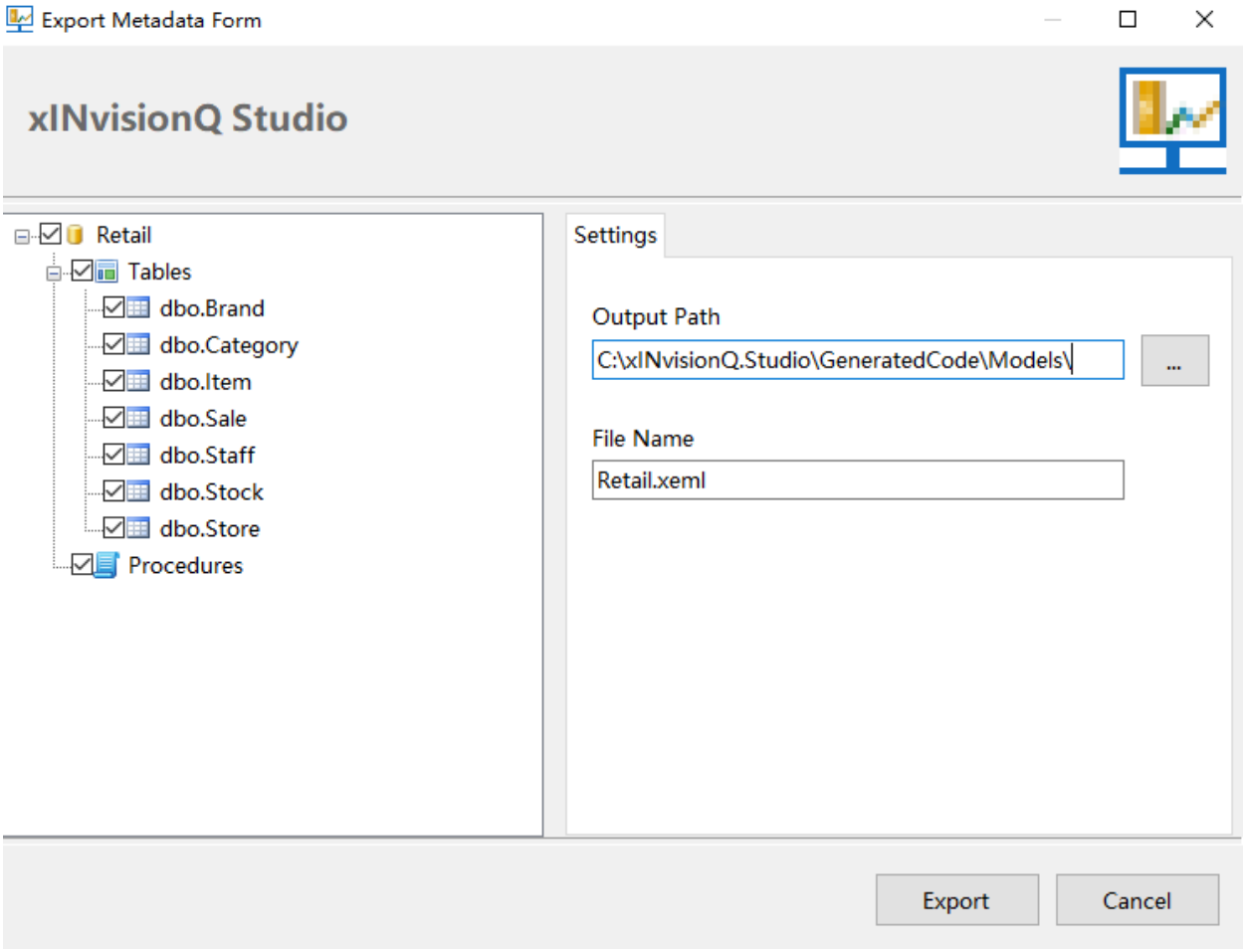
The Model Builder allows you to visually build and edit model. When you double-click a **Schema** file from the Solution Explorer, the schema file is opened in the Model Builder.



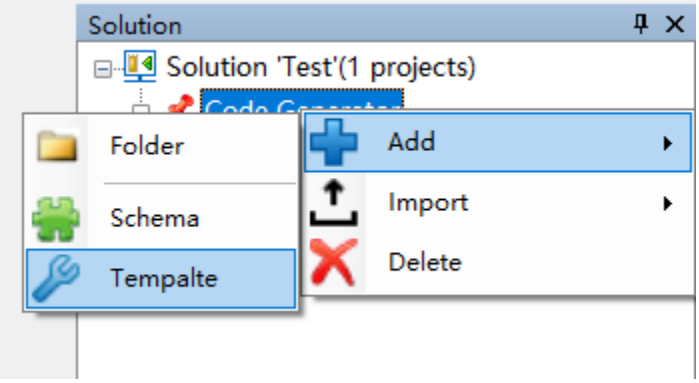
Export Model from Database Server

You can also export the model file from the database server instead of creating it from scratch. Once connected to the database, right-click the database node and click **Export Schema Metadata** menu item to open the Export Schema Metadata wizard; you can then directly import the exported schema file into solution from the solution panel by right clicking the selected **Generator** project and hovering over Import.


Server Explorer
localhost <MySQL>
Databases (7)
information_schema
mysql
performance_schema
retail
sakila
sys
world
localhost\SQLEXPRESS <SQLServer>
Databases (3)
Future
Retail
Trad
Refresh
Report for
Diagram for
Export Schema Metadata
Generate


Export Metadata Form
xINvisionQ Studio
Retail
Tables
dbo.Brand
dbo.Category
dbo.Item
dbo.Sale
dbo.Staff
dbo.Stock
dbo.Store
Procedures
Settings
Output Path
C:\xINvisionQ.Studio\GeneratedCode\Models\
...
File Name
Retail.xeml
Export
Cancel

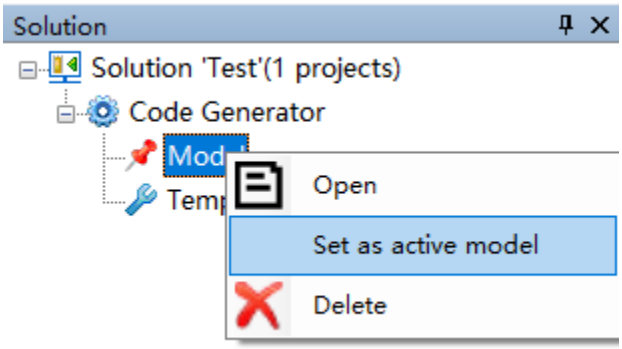
Now hover over **Add** and click the **Template** button to create a new template; you can also import the existing template by hovering over **Import** then click **Template** button.

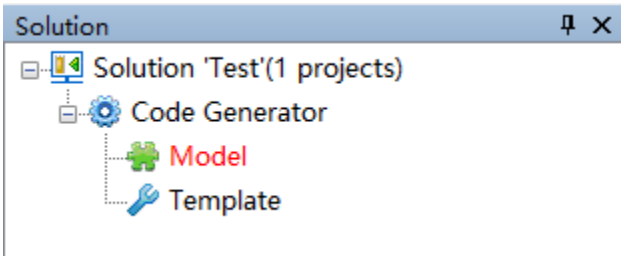


Once you have the model and template set, you can then start the code generation process by following the steps below:

Step 1: Set Active Model

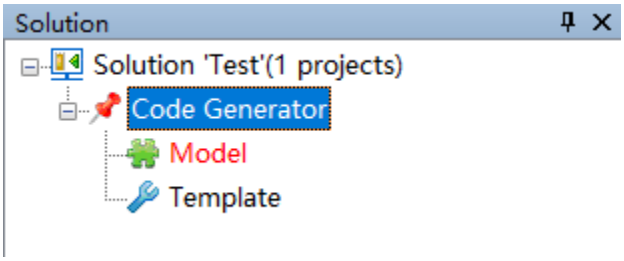
First right click the Schema file then click the **Set as active model** button to set that model as the Active Model (once the model is set as the active one the color of the model's text will turn red and stay in a red color).



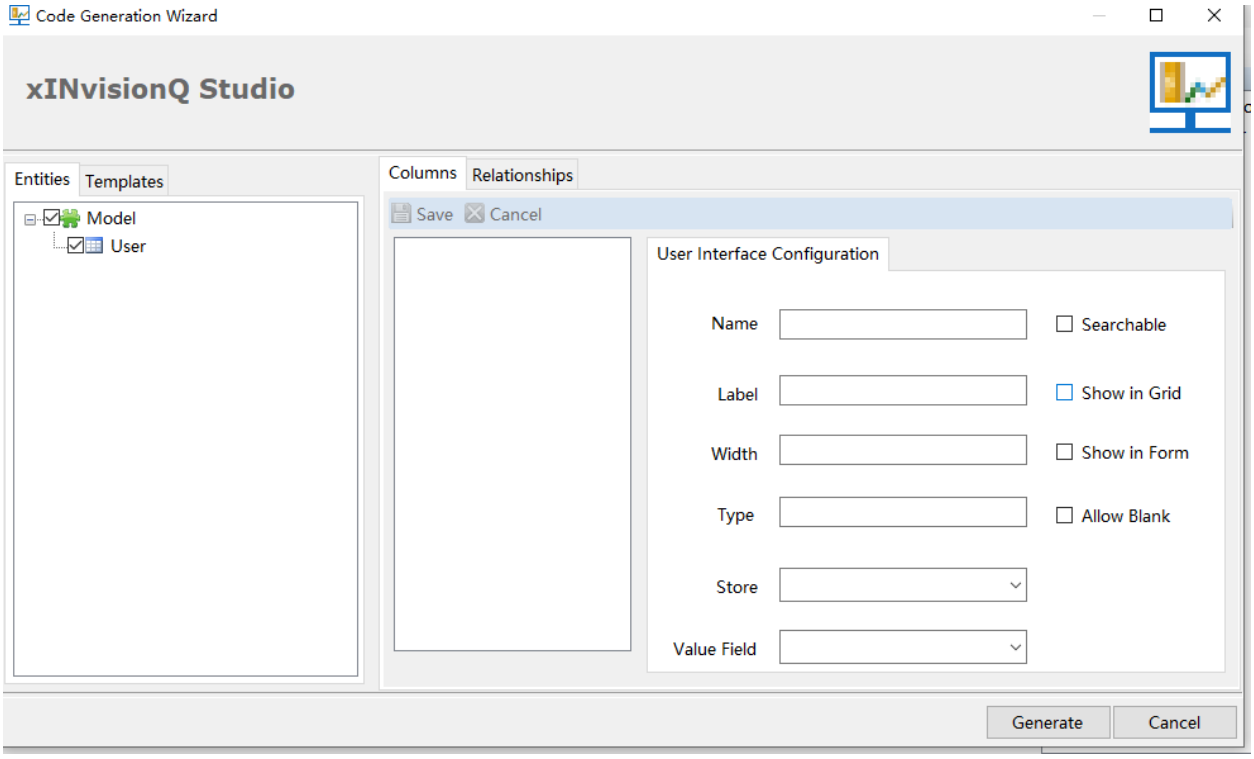


Step 2: Select the Generator project

After setting the active model, you have to select the **Generator** project in order to generate code – click on the Generator project to choose it (once selected a red pin will be displayed on the left of the selected generator).

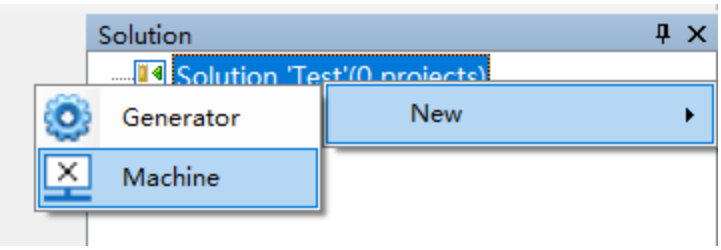


Lastly click the **Generate Code** button in the lower toolbar to prompt the Code Generation wizard to commence the code generation process after clicking the **Generate** button at the bottom of the wizard.

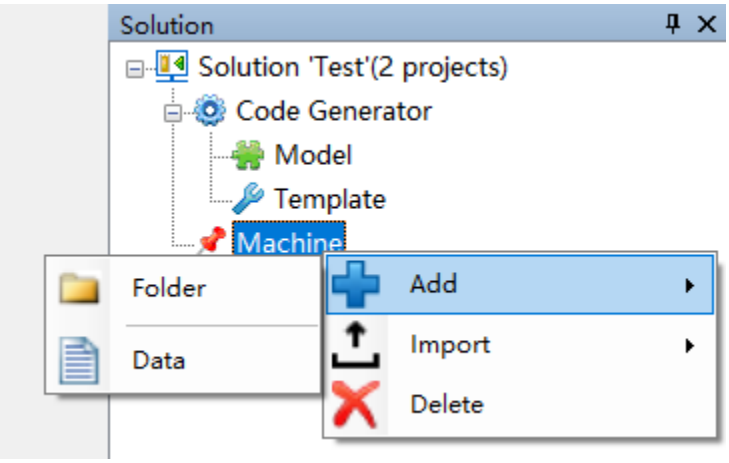


Creating a Machine Project for Data Forecast

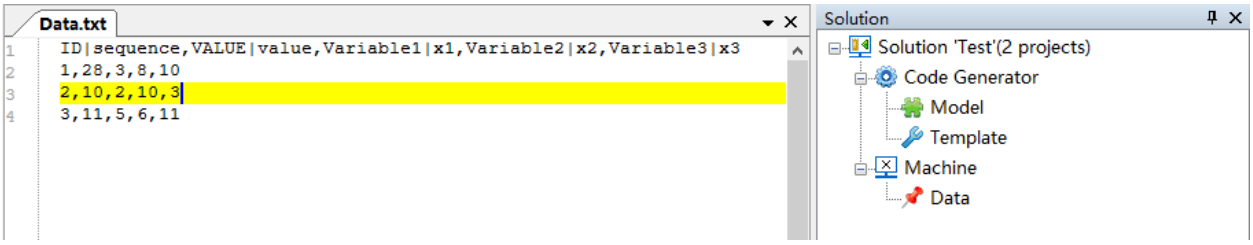
Right click the solution to bring up the context menu. Hover over **New** then click the **Machine** button to create a new **Machine** project.



Right click the Machine project to bring up the context menu. Hover over **New** then click the **Data** button to create a new Data file; you can also import the existing data by hovering over **Import** then click **Data** button.



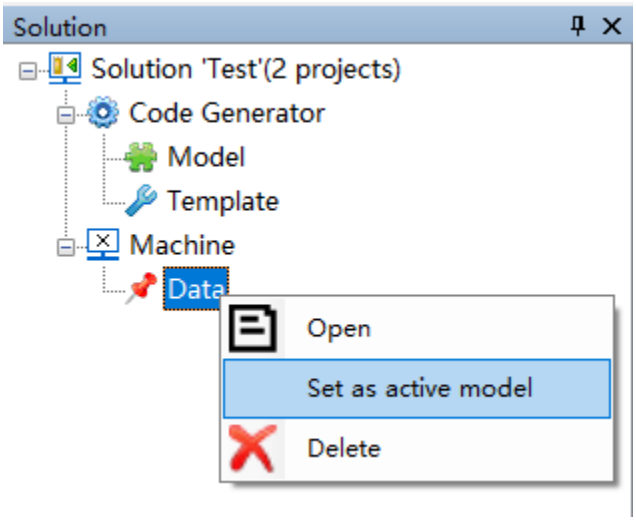
In order to conduct any forecasting it is mandatory that the data file has two columns – one must be the sequence column to order the dataset, and the other must be the data you wish to analyze and forecast. If you wish to only obtain a probabilistic forecast then two columns in your data file is sufficient enough; if you strive to obtain a certain function to fit and forecast the data then it'll be necessary to add more variables (i.e. x1, x2, x3) to the data file. For more information regarding how the data file should be formatted for use in xINvisionQ.Studio, please reference the Demo Solution in the Appendix.



Once you have the data set, you can then start the forecast process by following the steps below:

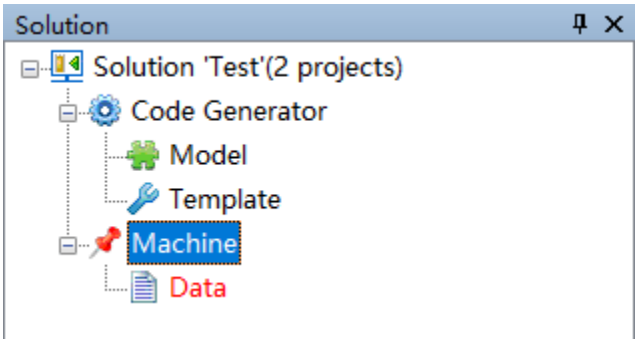
Step 1: Set Active Model

First right click the Data file then click the **Set as active model** button to set that data as the Active Model (once the data is set as the active one the color of the data's text will turn red and stay in a red color).



Step 2: Select the Machine project

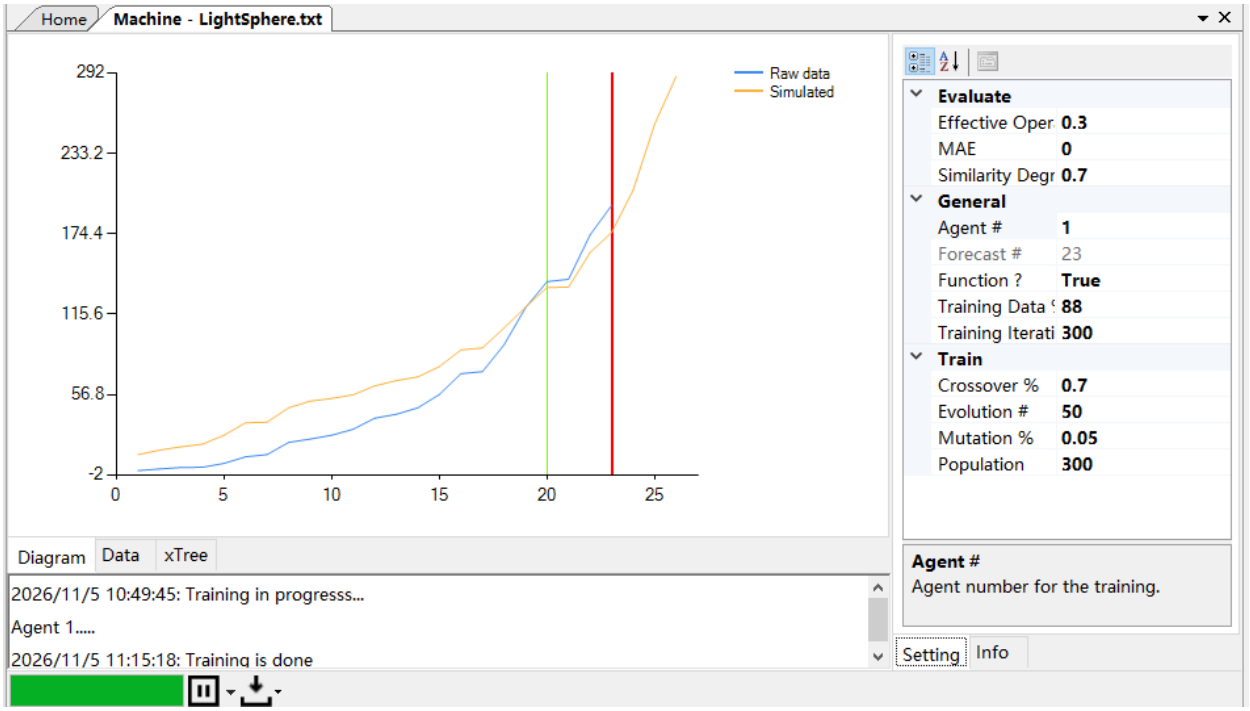
After setting the active model, you have to select the **Machine** project in order to forecast – click on the Machine project to choose it (once selected a red pin will be displayed on the left of the selected machine).

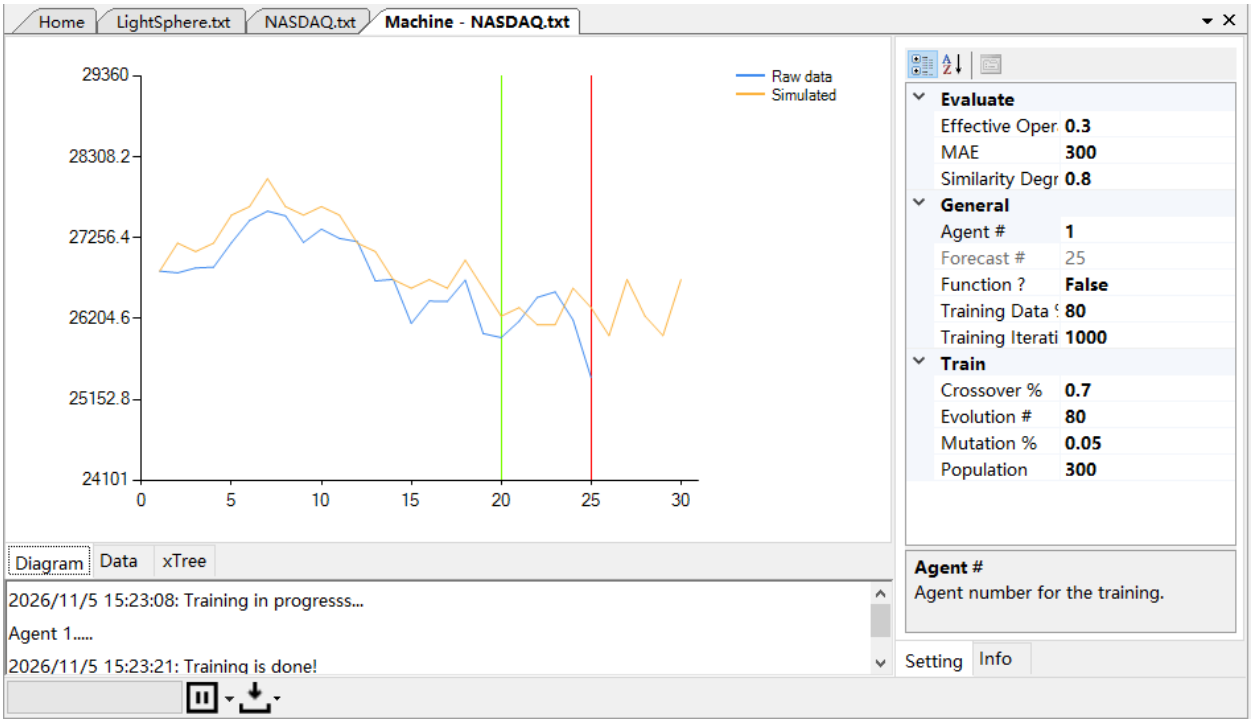


Lastly click the **New Training** button in the upper toolbar to open the forecast form; you can configure the training parameters first and then clicking the **Train** button in the lower toolbar.

Upon completion of the training and forecast process, the results and corresponding metrics are shown across the three tabs at the bottom – Diagram, Data, and xTree. The Diagram tab displays the fitting, verifying, and forecasting graphic all together in one visual diagram; the Data tab lists all the data in a table for viewing; the xTree tab will be where the function is shown if the Function forecast was set as True, and a decision-tree will be shown if the Function was set as false (True sets it to a deterministic forecast, False sets it to a probabilistic forecast).

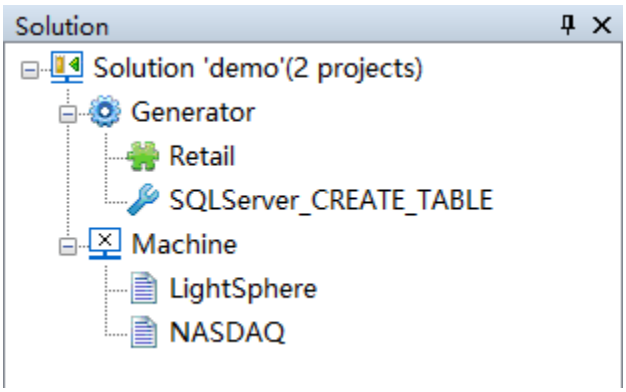
The forecast process can be terminated at any time while it is in operation by clicking the **Stop** button; while all the generated diagram(s) and data can be exported by clicking the **Export** button as well.





Appendix

xINvisionQ.Studio comes with a Demo solution located at c:\xinvisionq\solution\demo\demo.xvq; which can be accessed by clicking the **Open Solution** button in the lower toolbar.



This demo solution comes with one Generator project that includes a Retail model and a Machine project that includes two data files.

With the included Generator project you can import multiple templates that can generate code (i.e. SQLServer_CREATE_TABLE) to create SQL script for creating tables with Microsoft SQL Server.

With the Machine project you can run a deterministic forecast by using the LightSphere data or a probabilistic forecast using the NASDAQ stock data.