Navicat
Data Modeler

Version 3 User Guide

PremiumSoft™
PremiumSoft CyberTech Ltd.

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Chapter 1 - Introduction

About Navicat Data Modeler

Navicat Data Modeler is a powerful and easy-to-use GUI tool for creating and manipulating database models. It enables users to design database structures, reverse engineer, forward engineer, generate SQL files and print models to files, etc.

Navicat Data Modeler is available on three platforms - Microsoft Windows, macOS and Linux. Here are some highlights of Navicat Data Modeler:

- Create and manipulate conceptual/logical/physical models.
- Support various database systems: MySQL, MariaDB, Oracle, PostgreSQL, SQLite and SQL Server (including cloud databases like Amazon RDS, Amazon Redshift, Alibaba Cloud, Microsoft Azure).
- Reverse engineer databases/schemas or tables/views to a model.
- Forward engineer a physical model to a SQL file or a database/schema.
- Create and edit table structures directly.
- Support Navicat Cloud.

For details, visit our website: https://www.navicat.com

System Requirements

Windows

- Microsoft Windows Vista, Windows 7, Windows 8, Windows 8.1, Windows 10, Server 2008, Server 2012, Server 2016, Server 2019

macOS

- macOS 10.12 Sierra, macOS 10.13 High Sierra, macOS 10.14 Mojave, macOS 10.15 Catalina, macOS 11 Big Sur

Linux

- Debian 9 or later, Ubuntu 16.04 or later, CentOS 7 or later, Fedora 26 or later, Linux Mint 18 or later

Supported Databases

- MySQL - 3.23, 4.0, 4.1, 5.0, 5.1, 5.5, 5.6, 5.7, 8.0
- MariaDB - 5.1, 5.2, 5.3, 5.5, 10.0, 10.1, 10.2, 10.3
- SQL Server - 2000, 2005, 2008, 2008 R2, 2012, 2014, 2016, 2017 and SQL Azure

- Oracle - 8i Release 1, 8i Release 2, 8i Release 3, 9i Release 1, 9i Release 2, 10g Release 1, 10g Release 2, 11g Release 1, 11g Release 2, 12c Release 1, 12c Release 2, 18c
- PostgreSQL - 7.3, 7.4, 8.0, 8.1, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 10.0, 11.0
- SQLite 3

Installation

We strongly suggest that you shut down any opened applications. This will help ensure a smooth installation.

Installation for Download Version

1. Download Navicat Data Modeler macOS version.
2. Open the **.dmg** file.
3. Drag Navicat Data Modeler to your Applications folder to install.

Installation for CD Version

1. Load the Navicat Data Modeler CD Installation disk into the CD-ROM drive.
2. Open the **.dmg** file.
3. Drag Navicat Data Modeler to your Applications folder to install.

Registration

When the trial period is finished, Navicat Data Modeler requires a license key or a subscription plan to continue using the features.

Note: Perpetual License and Subscription Plan cannot be used at the same Navicat Data Modeler. Before changing the registration method, you need to deactivate the license key or sign out your Navicat ID.

Perpetual License

If you have purchased a perpetual license, you will receive a license key for activating Navicat Data Modeler.

In the **Perpetual License** section, paste your license key (16 digits) and click the **Activate** button. Navicat Data Modeler contacts our licensing server to activate the license key. If the activation process is successful, the license key details are displayed.

Manual Activation

Manual activation is available when your computer does not have an internet connection. You will need another computer with an internet connection to complete this activation process.

1. If the online activation is failed, click **Manual Activation**.
2. Copy the Request Code in the **Copy the Request Code Here:** box.
3. Open web browser on a computer with an internet connection and then go to https://customer.navicat.com/manual_activate.php.
4. Paste/Enter the Request Code into the left box.
5. Click **Get Activation Code**.
6. Copy the generated Activation Code in the right box.
7. Go back to the computer where you are activating Navicat Data Modeler.
8. Paste the Activation Code into the **Paste the Activation Code Here:** box.
9. Click **Activate**.

Subscription Plan

If you have subscribed a plan, you can sign in your Navicat ID to use Navicat Data Modeler during the subscription term.

Note: Navicat ID is the Email address that you used to subscribe the plan.

In the **Subscription** section, provide your **Navicat ID** and **Password**. After signed in, the subscription plan details are displayed.

Navicat Data Modeler contacts our licensing server once per hour to auto reload the plan by default. If you have updated your plan in the portal site, you can use the **Reload Plan** button to force reloading the new plan.

Note: Each Navicat ID can connect to only one Navicat Data Modeler. If you sign in your Navicat ID in another Navicat Data Modeler, you will be signed out from the current Navicat Data Modeler.

Migration / Upgrade

Migrate Navicat Data Modeler to a new computer

1. In Navicat Data Modeler, choose **Navicat Data Modeler** -> **Registration**.
2. [Perpetual License] Click **Deactivate** to online deactivate the license key.
3. [Subscription Plan] Click **Sign Out** to sign out your Navicat ID.
4. Uninstall Navicat Data Modeler from the existing computer.
5. Re-install Navicat Data Modeler in the new computer.

Upgrade Navicat Data Modeler

If you want to upgrade an installed copy of Navicat Data Modeler to the latest release, please choose **Navicat Data Modeler** -> **Check for Updates** to start the Updater. It will automatically check your installed version. If there is a new version, simply follow the steps in the Updater to upgrade your Navicat Data Modeler. It will replace your previous Navicat Data Modeler and your current settings will remain unchanged.

Or, you can submit your registered email address on the Customer Center to download the latest version installer.

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Note: For the License Agreement of Navicat Cloud service, please click here.

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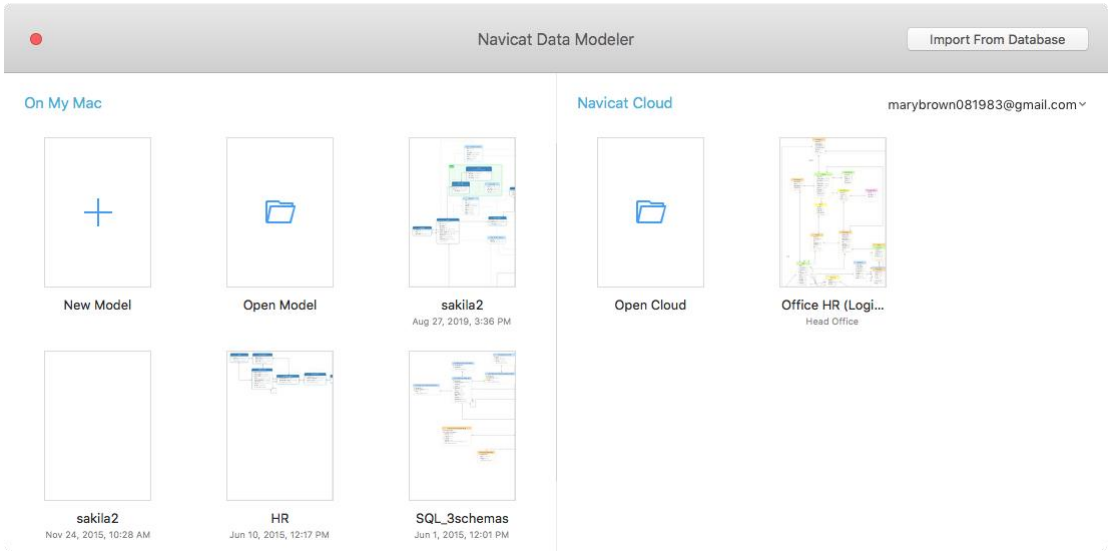
Chapter 2 – User Interface

Welcome Window

When you start Navicat Data Modeler, a Welcome Window will pop up. In this window, you can choose to create a new model, open an existing model file, etc. After logged into Navicat Cloud, the Welcome Window divided into two parts: **On My Mac** and **Navicat Cloud**. You can access or save models in the local computer and Navicat Cloud.



Create a new model

1. Click **New Model** in the Welcome Window.
2. Select the model type and other settings.

Create a new model from a database

1. Click **Import From Database** in the Welcome Window.
2. Follow the Import from Database wizard steps.

Open an existing model

1. Click **Open Model** or **Open Cloud** in the Welcome Window.
2. Choose a model file to open.

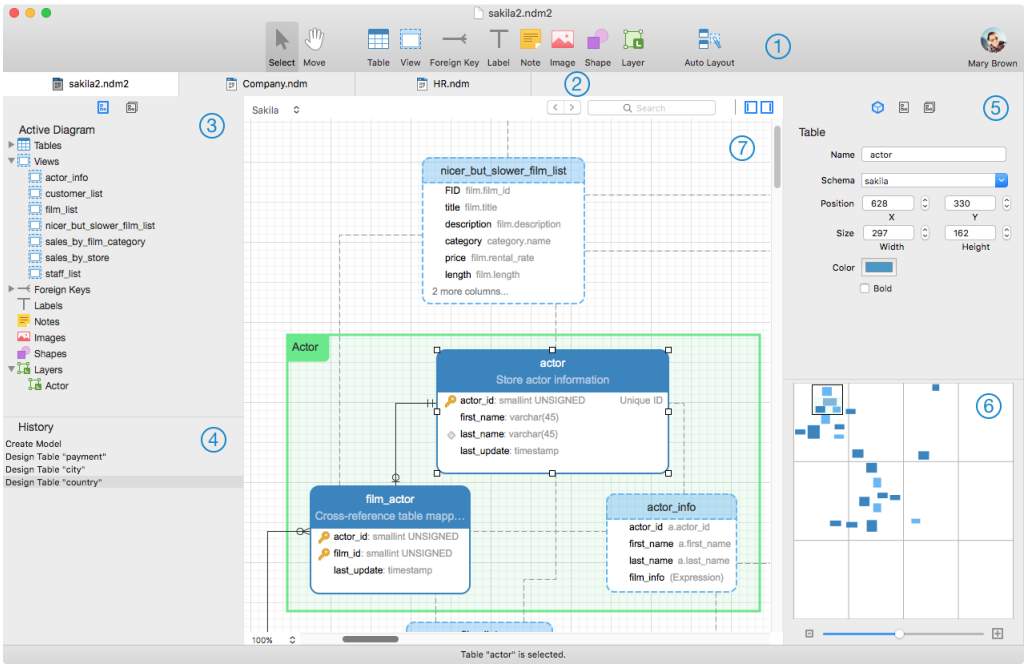
Clear the history of the recent opened models

1. Choose **File** -> **Open Recent** -> **Clear** from the menu bar.

Main Window

The Main Window consists of a toolbar, several panes and a diagram canvas for you to design your model. Each model is represented by a tab in the Main Window. A model file can have more than one diagram. You can choose the diagram from the list. To create a new diagram, choose **Diagram** -> **New Diagram** from the menu bar.

Hint: Navicat Data Modeler has added support for the system-wide dark mode.



① Toolbar

The Toolbar is located near the top of the Main Window. The buttons display in the toolbar depend on the model type (physical, logical and conceptual). You can use the toolbar to perform some basic tasks, such as adding tables, entities or views, applying Auto Layout feature, etc. To use small icons and hide the captions, icons or toolbar, control-click on the toolbar and select the appropriate option.

② Tab Bar

The Tab Bar allows you to switch among the tabbed model windows. You can also choose to always display pop-ups on a new tab, or to always display them in a new window. If the Tab bar is hidden, choose **View** -> **Show Tab Bar** -> **Show** from the menu bar. See also Preferences.

③ Explorer Pane

The Explorer pane has two tabs: **Model** and **Active Diagram**. The Model tab holds all schemas, tables, views or entities in the model, including those used in each individual diagram. You can simply drag an object from the Model tab and drop to the active diagram canvas. The Active Diagram tab holds all the objects (tables, views, layers, notes, images, relations, etc) added to the active diagram. If the Explorer pane is hidden, choose **View** -> **Show Explorer** from the menu bar.

④ History Pane

The History pane shows all the actions that you have taken. Simply click an action to restore that state. If the History pane is hidden, choose **View** -> **Show Explorer** and **Show History** from the menu bar.

⑤ Properties Pane

The Properties pane includes the **Model**, **Diagram** and **Object** tabs for setting default properties for your model. You can edit the properties settings of the model, the active diagram and the selected objects quickly. If the Properties pane is hidden, choose **View** -> **Show Properties** from the menu bar.

Option	Description
Begin style	The style of the arrow's back.
Black and white	Check this box to change the diagram color to black and white.
Bold	Check this box or press COMMAND-B to bold the table, view, entity, foreign key, relation or shape.
Border Color	The color of the shape's border.
Cap Style	The cap style of the line/arrow.
Cardinality	The foreign key/relation cardinality of the table/entity.
Case Sensitive	The case sensitivity of the table or view names. Available only for MySQL and MariaDB physical models.
Color	The color of the object.
Dash Style	The dash style of the line/arrow.
Database	The database server type of the model.
Database Version	The database version of the model.
Default Database	The default database of the model.
Default Schema	The default schema of the model.
End Style	The style of the arrow's front.
Entity Font	The font and font size of tables/entities.
Font	The font and font size of notes, labels or layers.
Font Color	The font color of the notes, labels or layers.
Join Style	The join style of the line/arrow.
Model Type	The type of the model: Physical, Logical or Conceptual.
Model Version	The version of Navicat Data Modeler that used to create the model.
Name	The name of the object.
Notation	The notation of the diagram. The notation options are depended on the model type.
Note Style	The style of the note. The value for this can be Note or Label.
Opacity	The transparency of the image/shape.
Pages	The width and height of the diagram (number of papers).
Position	The number of pixels from the object to the left side (X) and the top (Y) of the canvas.
Referenced	The referenced (parent) table, view or entity.
Referencing	The referencing (child) table, view or entity.

Schema	The database/schema name of the table/view.
Show entity comments	Check this box to show the entity comments in the diagram.
Show field comments	Check this box to show the field comments in the diagram.
Show name	Check this box to show the name of the foreign key, relation or shape.
Show schema name	Check this box to show the database/schema names of the tables/views in the diagram.
Show table comments	Check this box to show the table comments in the diagram.
Show view relationships	Check this box to show the relationship line of the view.
Size	The width and height of the object.
Visible	Check this box to show the foreign key or relation lines.

⑥ Overview Pane

The Overview pane displays the whole active diagram in the canvas. To zoom in or zoom out the selected area of the diagram, adjust the slider. Same effect can be achieved with keyboard shortcuts:

Zoom In: [COMMAND-+] or [COMMAND-Mousewheel Up]

Zoom out: [COMMAND--] or [COMMAND-Mousewheel Down]

If the Overview pane is hidden, choose **View** -> **Show Properties** and **Show Overview** from the menu bar.

⑦ Diagram Canvas

You can design your diagram on the Diagram Canvas. All added objects can be moved (by dragging them with mouse or by keyboard), resized, aligned to the grid, etc.

Chapter 3 – Navicat Cloud

About Navicat Cloud

Navicat Cloud provides a cloud service for synchronizing model files and virtual group information from Navicat Data Modeler, other Navicat family members, different machines and different platforms. All the Navicat Cloud objects are located under different projects. You can share the project to other Navicat Cloud accounts for collaboration.

Navicat Cloud could not connect and access your databases. By which it means, it could only store your connection settings, queries, model files, and virtual group; your database passwords and data (e.g. tables, views, etc) will not be stored to Navicat Cloud.

Note: PremiumSoft will keep all synchronized files strictly confidential, and all employees are prohibited from viewing/accessing content of files you may store in your Navicat Cloud account.

Create a new account

1. In the Welcome Window, click **Create Navicat ID**. Or, in the Main Window, click **Sign In** and click **Create Navicat ID**.
2. Enter the required information and click **Sign Up** button. A verification email will send to your email address.
3. Click the link in the email to verify the new account.

Hint: You can sign in with the same Navicat ID you use for the Navicat Customer Center.

Sign in Navicat Cloud

1. In the Welcome Window, enter your **Navicat ID** and **Password**. Or, in the Main Window, click **Sign In** and enter your **Navicat ID** and **Password**.
2. Click **Sign In** button.
3. If you enabled two-step verification in Navicat Cloud Portal site, a code will be sent to your phone via your mobile app. Enter the received code to sign in.

Open a model from Navicat Cloud

1. Choose **File** -> **Open from Navicat Cloud** from the menu bar.
2. Select a model file and click **Open**.

Save a model to Navicat Cloud

1. Choose **File** -> **Save to Navicat Cloud** from the menu bar.
2. Enter the **Model Name**.

3. Click **Save**.

Save a cloud model to local machine

1. Choose **File** -> **Save to Local** from the menu bar.
2. Enter the file name and choose the save path.
3. Click **Save**.

Sign out Navicat Cloud

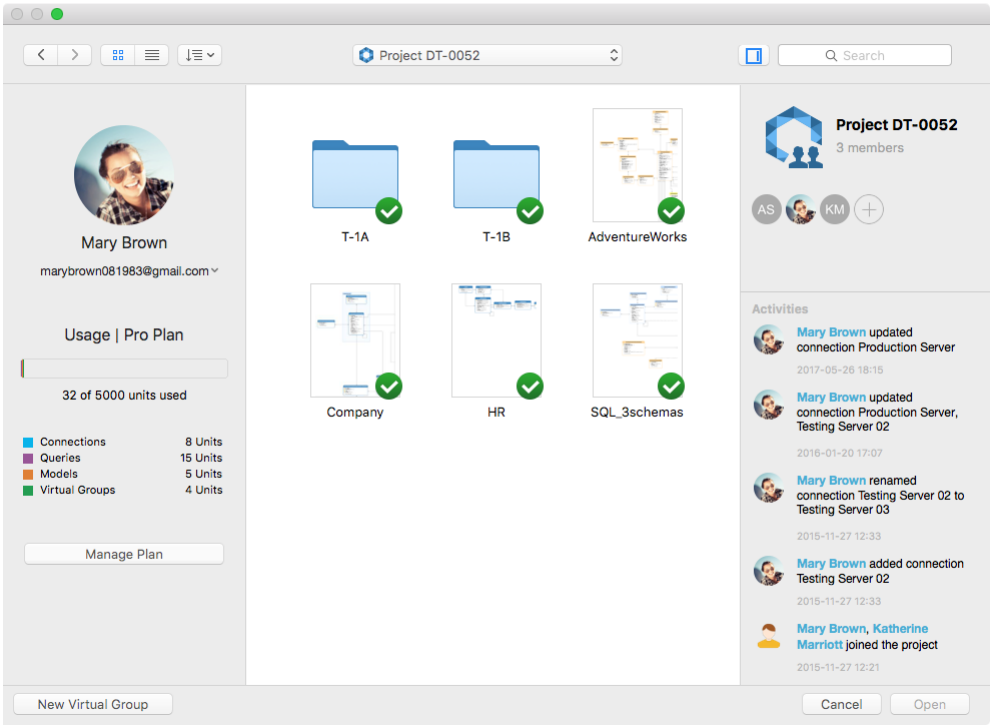
1. Click your avatar in the Main Window to open the Navicat Cloud window.
2. Click your email in the User Info pane and choose **Sign Out**.

Manage Navicat Cloud

After logged into Navicat Cloud, you can open the Navicat Cloud window by clicking your avatar in the Main Window. In the Navicat Cloud window, you can view the account details and manage the models and virtual groups that stored in Navicat Cloud.

The left **User Info** pane shows the account details and the cloud usage. The right **Navicat Cloud Activity** pane shows the project members and activities. If the Navicat Cloud Activity pane is hidden, you can click the button to show it.

Note: A model file or a virtual group counts for one unit.



Change your avatar

1. Click the avatar in the User Info pane.

2. Choose an image file.

Manage your Navicat Cloud account

1. Click your email in the User Info pane and choose **Manage Account**.
2. A browser will open with Navicat Cloud Portal site.

Upgrade the Navicat Cloud plan

1. Click **Upgrade**.
2. A browser will open with Navicat Cloud Portal site.

Create a project

1. Select Navicat Cloud.
2. Click **New Project**.

Add members to a project

1. Select a project.
2. Control-click it and select **Collaborate with**.
3. Click **Add Members**.
4. Enter the members' Navicat ID.
5. Select the member role.
6. Click **Add**.

Member Roles	Privileges
Owner	Read Objects, Write Objects, Manage Members and Delete Project
Admin	Read Objects, Write Objects and Manage Members
Member	Read Objects and Write Objects
Guest	Read Objects

Note: Each time can add up to 10 members. Use comma or enter to separate the members in the edit box.

Manage members in a project

1. Select a project.
2. Control-click it and select **Collaborate with**.
3. Click **Apply** after changes.

Note: If you are the Owner or Admin, you can click the **x** button to remove the member.

Rename a project

1. Select a project.
2. Control-click it and select **Rename**.
3. Enter the project name.

Quit a project

1. Select a project.
2. Control-click it and select **Quit Project**.

Delete a project

1. Select a project.
2. Control-click it and select **Delete Project**.

Rename a model

1. Select a model file.
2. Control-click it and select **Rename**.
3. Enter the model name.

Delete a model

1. Select a model file.
2. Control-click it and select **Delete**.

Create a virtual group

1. Click **New Virtual Group**.
2. Enter the group name.

Move a model to a virtual group

1. Select a model file.
2. Control-click it and select **Manage Group** -> **Add to Group**.

Move a model to the top-level from a virtual group

1. Select a model file.

2. Control-click it and select **Manage Group** -> **Remove From Group**.

Rename a virtual group

1. Select a virtual group.
2. Control-click it and select **Rename**.
3. Enter the group name.

Delete a virtual group

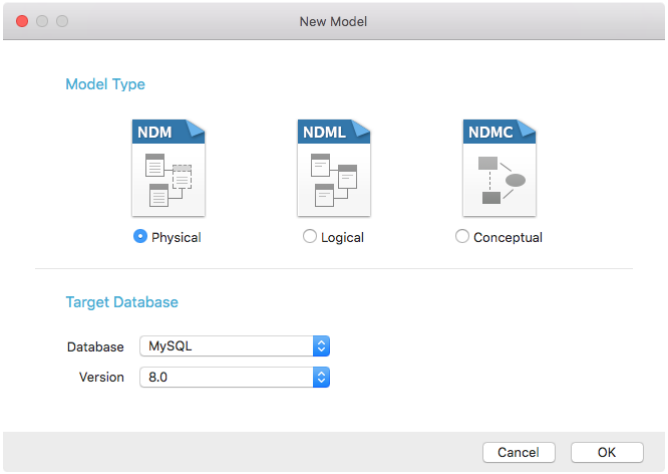
1. Select a virtual group.
2. Control-click it and select **Delete**.

Chapter 4 – Physical Models

Create Physical Models

Navicat Data Modeler allows you to create physical models, including tables, fields, views, foreign key constraints and other physical properties of the database/schema.

To create a physical model, choose **File** -> **New** from the menu bar. In the **New Model** window, choose **Physical** as **Model Type** and select the target **Database** and **Version**.



You can also use the following features to create a physical model:

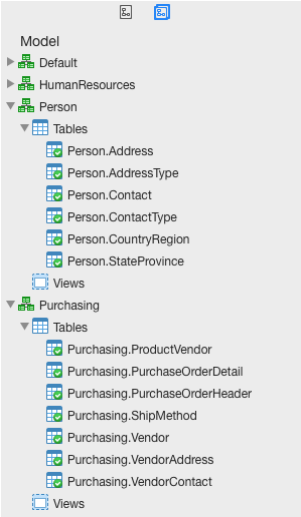
- Import from Database - reverse engineer from existing databases/schemas or ODBC data source.
- Model Conversion - convert from a logical/conceptual model.

After creating a physical model, you can compare and synchronize it to an existing database/schema or export it to a SQL file.

Add Databases / Schemas to Physical Model

When creating a new model, a database/schema (named Default) is automatically created and it is the default database/schema. All newly added objects (tables and views) are belonged to the default database/schema.

You can view all databases/schemas with their objects as tree structure on the Explorer's Model tab.



The pop-up menu options of a database/schema in the Explorer's Model tab include:

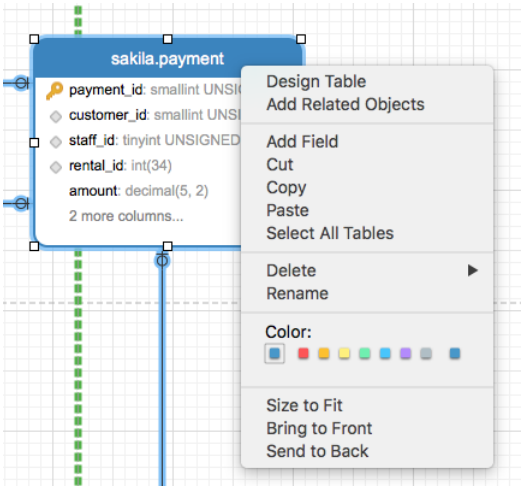
Option	Description
New Database / New Schema	Create a database/schema.
Delete Database / Delete Schema	Delete the selected database/schema including its objects from the model. The default database/schema cannot be deleted.
Rename	Change the name of the database/schema.
Set As Default Database / Set As Default Schema	Set the selected database/schema as the default database/schema.

Add Tables to Physical Model

To add a new table, click the **Table** button from the toolbar and click anywhere on the canvas. To add an existing table from the Explorer's Model tab, simply drag and drop the selected table from the Model tab to the canvas.

For Default diagram notation, the icon means the field is a primary key. The icon indicates that the field serves as an index.

Note: If you control-click a field, you can choose to add, insert, delete, rename the field and set the field as primary key.



The pop-up menu options of the table object in the canvas include:

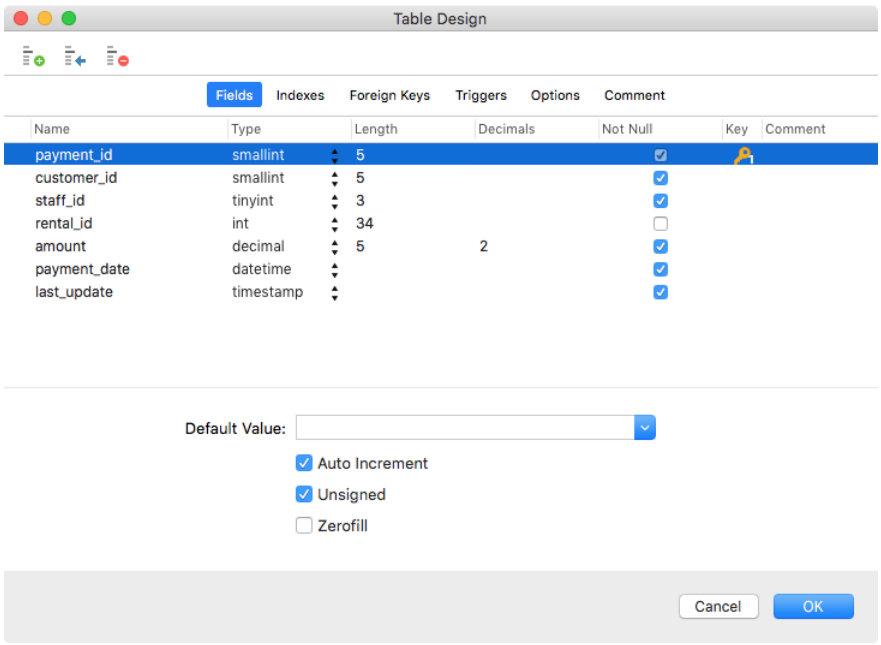
Option	Description
Design Table	Edit the table structure in a **Table Designer**, e.g. fields, indexes, foreign keys, etc.
Add Related Objects	Add all related tables/views to the selected table.
Add Field	Add fields to the existing table.
Cut	Remove the table from the diagram and put it on the clipboard.
Copy	Copy the table from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Tables	Select all tables in the diagram.
Delete	Delete a table from the diagram or from both diagram and model.
Rename	Change the name of the table.
Color	Change the color of the table.
Size to Fit	Resize the table automatically to fit its contents.
Bring to Front	Bring the table to the foreground.
Send to Back	Move the table to the background.

Table Designer

Table Designer is the basic Navicat Data Modeler tool for working with tables. It allows you to create, edit and drop table's fields, indexes, foreign keys, and much more.

Note: The tabs and options in the designer depend on the diagram database type and version you are chosen.

In the **Fields** tab, you can search a field name by pressing COMMAND-F.

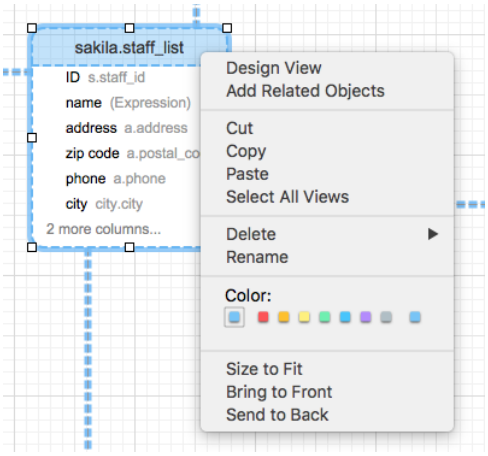


Add Views

Add Views to Physical Model

To add a new view, click the **View** button from the toolbar and click anywhere on the canvas. To add an existing view from the Explorer's Model tab, simply drag and drop the selected view from the Model tab to the canvas.

Note: If you control-click the view connector, you can choose to add or delete vertices and change its color.



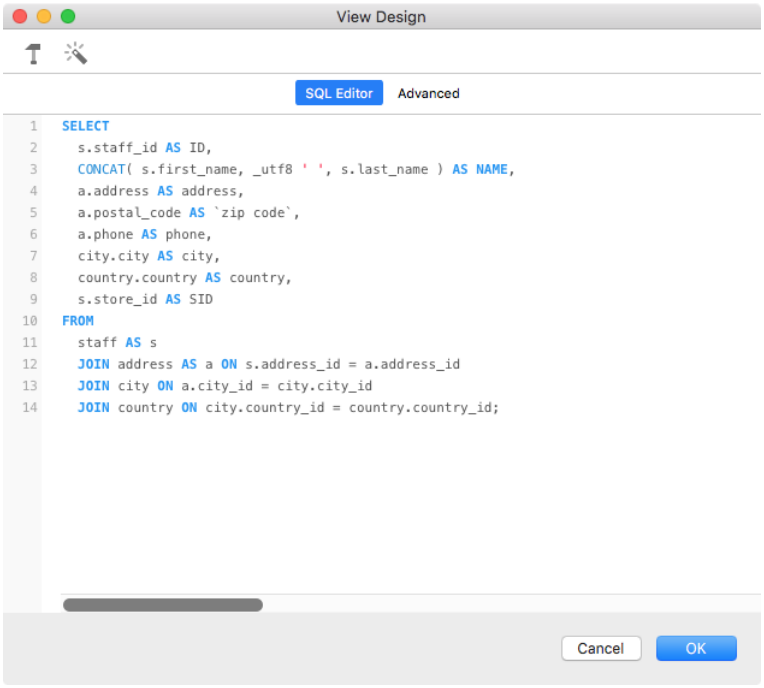
The pop-up menu options of the view object in the canvas include:

Option	Description
Design View	Edit the view structure in a **View Designer**.
Add Related Objects	Add all related tables/views to the selected view.
Cut	Remove the view from the diagram and put it on the clipboard.
Copy	Copy the view from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Views	Select all views in the diagram.
Delete	Delete a view from the diagram or from both diagram and model.
Rename	Change the name of the view.
Color	Change the color of the view.
Size to Fit	Resize the view automatically to fit its contents.
Bring to Front	Bring the view to the foreground.
Send to Back	Move the view to the background.

View Designer

View Designer is the basic Navicat Data Modeler tool for working with views. In View Designer, you can build the views visually using View Builder or edit the view definition in SQL Editor directly.

Note: The tabs and options in the designer depend on the diagram database type and version you are chosen.

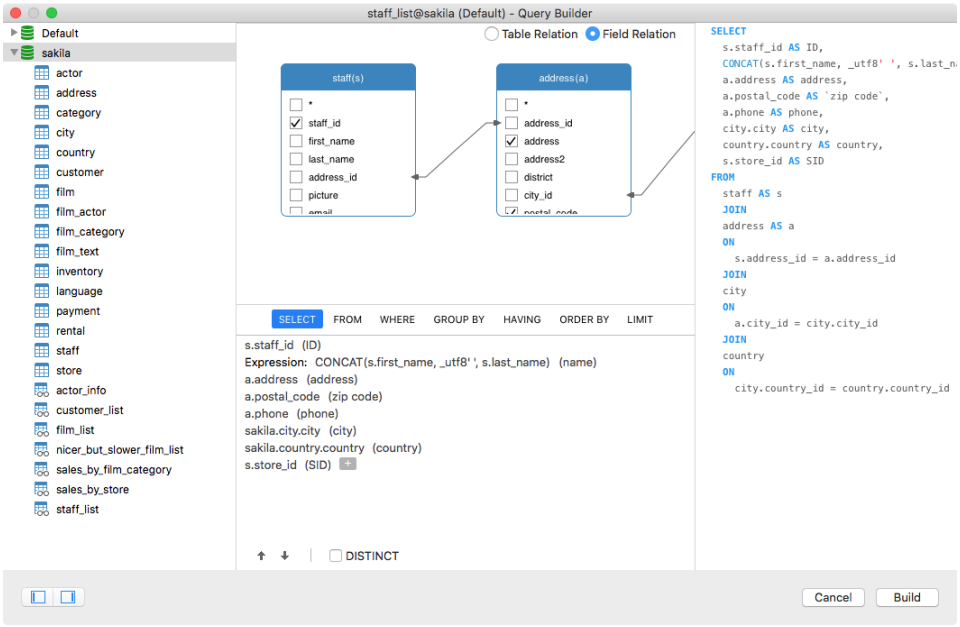


Work with View Builder (Available only in Non-Essentials Version)

Navicat Data Modeler provides a useful tool called **View Builder** for building views visually. It allows you to create and edit views without knowledge of SQL. Even if you are familiar with SQL, the convenient and fluent graphical interface makes it easier to create relations and visualize the view.

In View Designer, click the button to open the visual View Builder.

All database objects are displayed on the left **Object** pane. Whereas on the middle pane, it is divided into two portions: the upper **Diagram** pane, and the lower **Criteria** pane. When building the view, you can view the auto-generated SQL on the right **SQL** pane.



Add Objects to View

The first step is to decide which tables and views you need to add to the view.

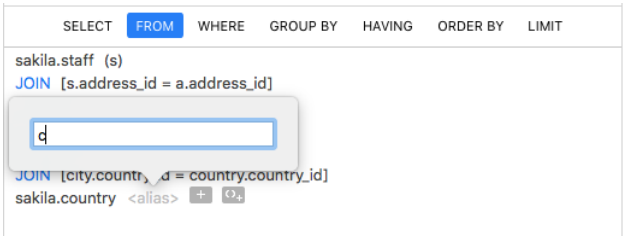
To add tables and views to the view, use one of the following methods:

- Drag them from the Object pane to the Diagram pane.
- Double-click them on the Object pane.

You can set aliases for tables, views and subqueries by double-clicking the object title on the Diagram pane and entering the name to use as an alias for the object name.

After you have added objects to the diagram, you can use the **FROM** tab to adjust the view to your needs.

- To change the object, click the object and select an identifier.
- To add the table alias, click **<Alias>**.



You can control-click an object on the Diagram pane and select **Remove**, or simply press DELETE key to remove the selected object from the view.

When you remove an object, View Builder automatically removes joins that involve that object.

Choose Output Fields

To include fields in the view, use one of the following methods:

- Check the left checkbox of a field name you want to add to the view on the Diagram pane.
- To include all the fields for an object, check the ***** checkbox on the Diagram pane.
- To add all fields for all objects, click + on the **SELECT** tab and select **All fields(*)**.

The selected fields display on the **SELECT** tab. You can specify additional output field options.

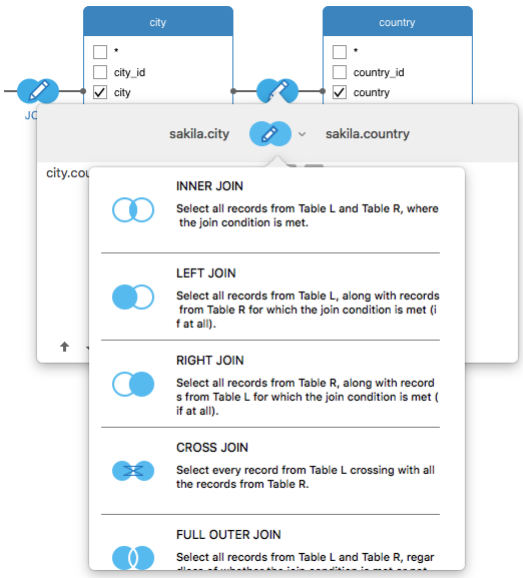
- Check the **DISTINCT** checkbox to force the view to return distinct results.
- To add the field alias, click **<Alias>** and enter the name.
- Click the identifier and select the **Aggregate** function.
- Use the up arrow and down arrow buttons to change the order of fields.

Set Field Association

View Builder will automatically join the tables as per the foreign key relations. If you want to associate database objects manually, just select a field from an object and drag it to a field in another object. A connector line appears between the two objects to visually represent the relationship and the join type.

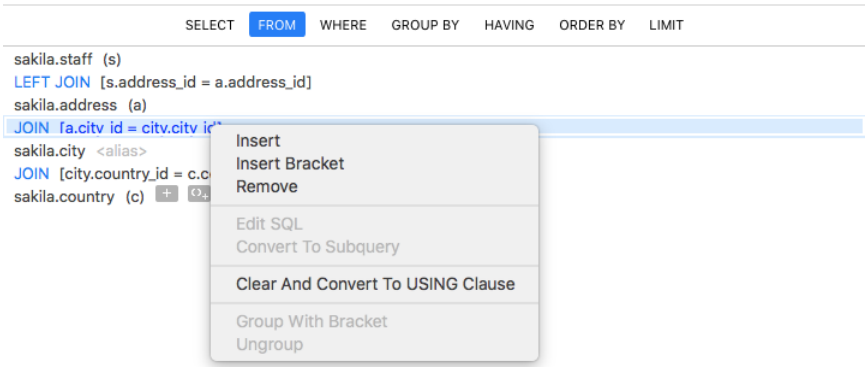
There are two views to show the connector lines: Table Relation and Field Relation. The **Field Relation** view allows you to identify matching fields in two tables, while the **Table Relation** view displays the join relationship between the two tables.

All joins is initially created as INNER JOIN by default. To change the association, click or double-click the connector line on the Diagram pane or click the JOIN keyword on the **FROM** tab, and then select a join type. If a join type is not listed, you can enter a customized one in the **Custom** textbox.



To remove a join, control-click the connector line and select **Remove**.

To modify the join condition, control-click a connector line and select **Edit Join**, or click the condition on the **FROM** tab.



The pop-up menu options of the FROM tab:

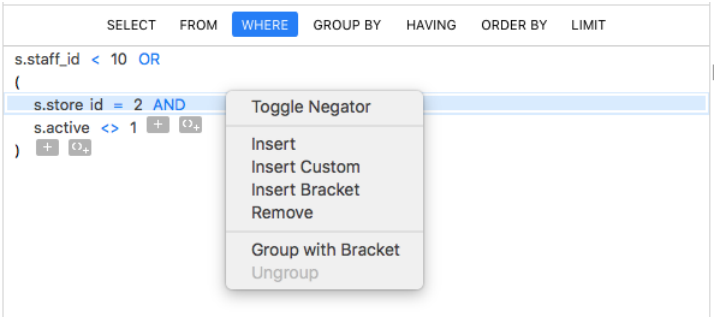
Option	Description
Insert	Add an identifier, an expression or a subquery.
Insert Bracket	Add a pair of parentheses.
Remove	Remove the identifier, expression or subquery.
Clear and Convert to	Remove the ON condition and convert it to USING clause.

USING Clause	
Clear and Convert to ON Clause	Remove the USING condition and convert it to ON clause.
Group with Bracket	Add parentheses to group the selected conditions.
Ungroup	Remove the parentheses.

Set Filter Criteria

When retrieving data, you may want to set up a filtering expression. To filter data returned by the view, control-click a field on the Diagram pane and select **WHERE** and an operator.

The condition is added to the **WHERE** tab. You can edit the value there by clicking **<Value>**. If you want to add a condition with parentheses, click . You can change a logical operator (and/or) by clicking it. Use the up arrow and down arrow buttons to change the order of conditions.



The pop-up menu options of the WHERE tab:

Option	Description
Toggle Negator	Reverse the meaning of the condition.
Insert	Add a condition.
Insert Custom	Add a custom condition.
Insert Bracket	Add a pair of parentheses.
Remove	Remove the condition.
Group with Bracket	Add parentheses to group the selected conditions.
Ungroup	Remove the parentheses.

Group Resulting Data

You can set the conditions for grouping records by control-clicking a field in the Diagram pane and selecting **GROUP BY** -> **Add Fields**.

The condition is added to the **GROUP BY** tab. Use the up arrow and down arrow buttons to change the order of fields.

On the **HAVING** tab, you can filter summarized data or grouped data. Select the identifiers, operators, aggregate or enter expressions to include in the condition. Use the up arrow and down arrow buttons to change the order of conditions.

The pop-up menu options of the HAVING tab:

Option	Description
Toggle Negator	Reverse the meaning of the condition.
Insert	Add a condition.
Insert Custom	Add a custom condition.
Insert Bracket	Add a pair of parentheses.
Remove	Remove the condition.
Group with Bracket	Add parentheses to group the selected conditions.
Ungroup	Remove the parentheses.

Sort Resulting Data

You can set the way of sorting records by control-clicking a field on the Diagram pane and selecting **ORDER BY** -> **ASC** or **DESC**. The condition will be added to the ORDER BY tab.

Limit Resulting Data

On the **LIMIT** tab, you can limit your view results to those that fall within a specified range.

Offset

Specify the number of records to be skipped. It is optional.

Limit

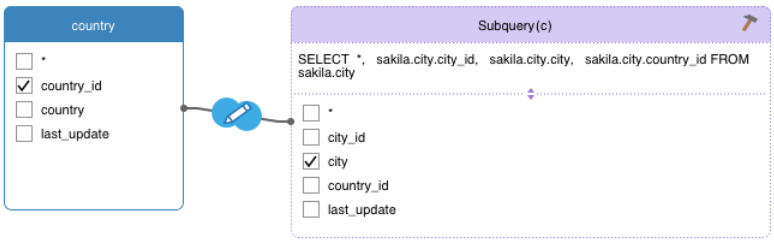
Specify the number of records to be displayed.

Note: Available only for MySQL, PostgreSQL, SQLite and MariaDB.

Add Expressions/Subqueries

You can add an expression or a subquery to further limit the view results. On the **FROM** tab, click  and select the **Expression/Subquery** tab.

After entered an expression or a subquery, confirm editing by pressing the ENTER key. It will be added to the Diagram pane indicates that the statement contains an expression or a subquery and identifies the columns it is on.



By clicking the  button, you will be switched to a subquery layer where you can build it visually in the same way as the main query.

You can always go back to the main query by clicking **(Main Query)**.

View Generated SQL

The **SQL** pane presents a read-only, formatted representation of the SQL generated by View Builder. You can copy the SQL that appears in the SQL pane for use in other tools. In a subquery layer, you can enable **Show Current Layer Only** to show the subquery SQL.

Edit Definition in SQL Editor

In the **SQL Editor** tab, you can create and edit the SELECT statement SQL for a view. Navicat Data Modeler provides a wide range advanced features for editing the view definition, such as compelling code editing capabilities, smart code-completion, sql formatting, and more.

Hint: SELECT statement will be automatically generated while you build in View Builder.

Beautify SQL (Available only in Non-Essentials Version)

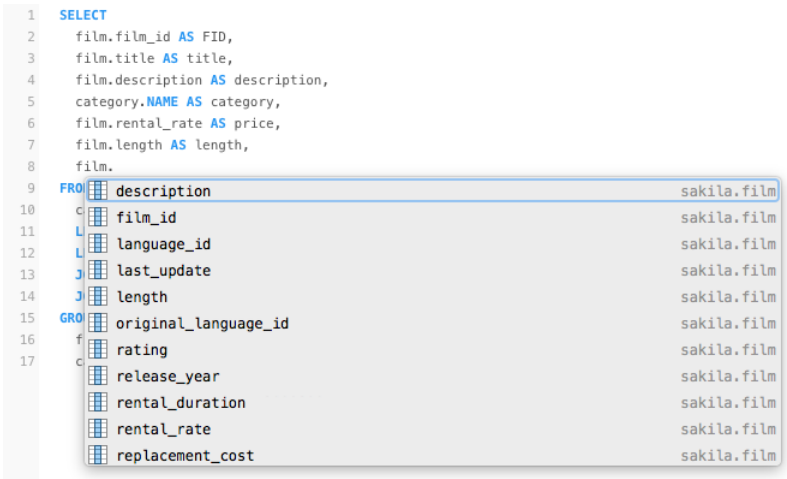
To format messy SQL code into a well-structured script, you can click the button. To minify SQL code by removing spaces, tabs and newlines, control-click the editor and select **Minify SQL**.

Code Completion (Available only in Non-Essentials Version)

Code completion feature in Navicat Data Modeler pops up a list of suggestions as you type your SQL statement in the editor. It assists you with statement completion and the available properties of database objects, for example databases, tables, fields, views etc with their appropriate icons and information.

To invoke code completion, just simply press '.' for the available properties of database object currently in the scope.

When the suggestion list appears, press TAB to insert the first item. You can also select the needed item using UPPER ARROW or DOWN ARROW and then press TAB or ENTER.



In addition, code completion can be invoked by typing a character or pressing ESC on your keyboard for SQL keywords/database objects.

Hint: Resize the suggestion list by dragging the lower right corner.

You can enable or disable the code completion feature in Preferences.

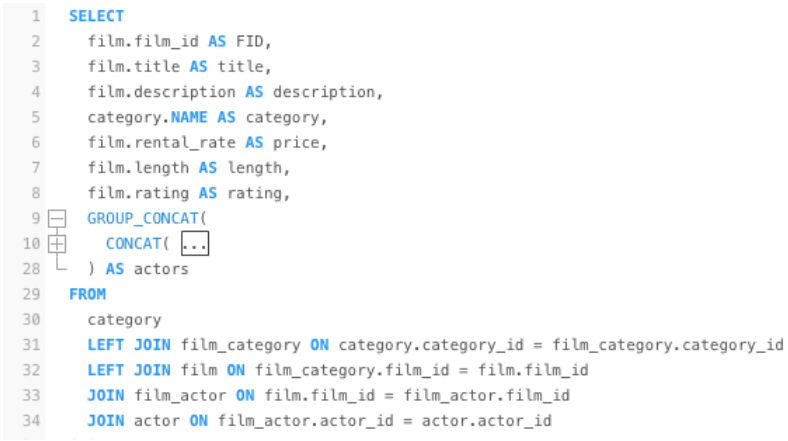
Clipboard Stack

When you copy or cut some codes as usual in the editor, the copied content will also be added to Clipboard Stack. Clipboard Stack can store up to 10 recent items and use the last-in-first-out logic. To paste an item from Clipboard Stack, you can press COMMAND-SHIFT-V. Press COMMAND-SHIFT-V multiple times to cycle through Clipboard Stack.

Code Folding

Code folding feature enables you to collapse blocks of code such that only the first line of the block appears in the editor.

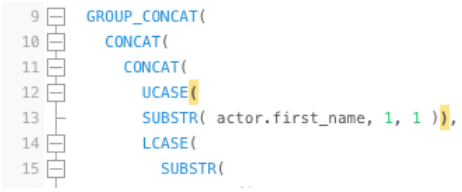
A block of code that can be folded is indicated by an icon ⊟ to the left of the first line of the block. A vertical line extends from the icon to the bottom of the foldable code. In contrast, a folded block of code is indicated by an icon ⊞ to left of the code block. You can fold the block by clicking ⊟ or expand it by clicking ⊞.



Brace Highlight

Navicat Data Modeler supports to highlight the matching brace in the editor, i.e. () .

Note: The cursor must be on a brace to show the highlight.



Find and Replace

Find

The Find bar is provided for quick searching for the text in the editor. Just simply choose **Edit** -> **Find** -> **Find** from the menu or press COMMAND-F, and then enter a search string.

Incremental searching is used here. As you type, the matched text is found and highlighted instantly. This saves your time from typing the entire text.

The search starts at the cursor's current position to the end of the file.

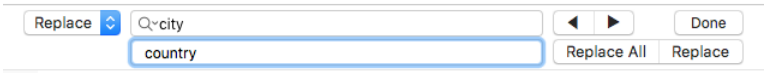
To find the previous or next occurrence, just simply click ◀ or ▶.

Replace

To open the Replace bar, simply choose **Edit** -> **Find** -> **Find and Replace** from the menu bar or press OPTION-COMMAND-F. Then, enter the text you want to search and replace.

Click the **Replace** button to replace the first occurrence.

Click the **Replace All** button to replace all occurrences automatically.



There are some additional options for Find and Replace, click :

Option	Description
Regular Expression	Search regular expressions.
Match Case	Enable case sensitive search.
Whole Word	Return the objects that match the entire word of the search string.

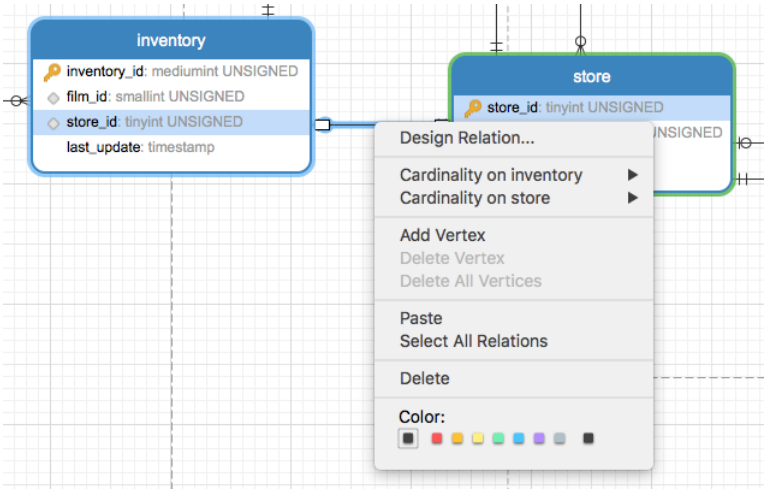
Copy with Quotes

To copy the SQL statement with quotes, just simply control-click the highlighted SQL. Then, select **Copy with Quotes** and choose the format.

Add Foreign Keys to Physical Model

To add a foreign key, click the **Foreign Key** button from the toolbar and drag and drop a field from the child table to the parent table. To show/hide the linked name label, simply check/uncheck the **Show name** option in the Properties pane.

When you move your mouse over a foreign key connector, the border of the parent and the child tables turn to green and blue respectively. Also, the referenced fields and the referencing fields are highlighted.



The pop-up menu options of the foreign key in the canvas include:

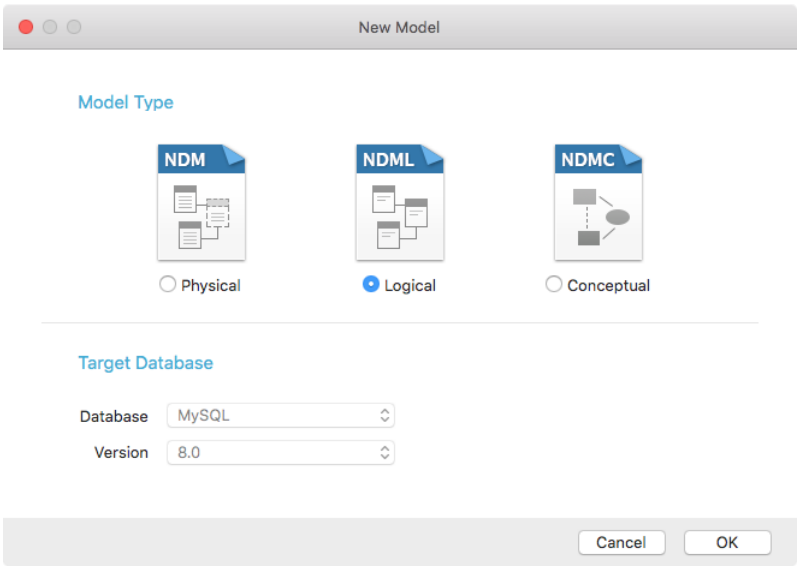
Option	Description
Design Relation	Edit the foreign key in a Table Designer.
Cardinality on table_name1	Set the cardinality on table_name1: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.
Cardinality on table_name2	Set the cardinality on table_name2: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.
Add Vertex	Add a vertex on a foreign key connector.
Delete Vertex	Delete a vertex on a foreign key connector.
Delete All Vertices	Delete all vertices on a foreign key connector.
Paste	Paste the content from the clipboard into the diagram.
Select All Relations	Select all foreign keys in the diagram.
Delete	Delete a foreign key from both diagram and model.
Color	Change the color of the foreign key.

Chapter 5 – Logical Models

Create Logical Models

Navicat Data Modeler allows you to create logical models, including entities, attributes and relations.

To create a logical model, choose **File** -> **New** from the menu bar. In the **New Model** window, choose **Logical** as **Model Type**.



You can also use the following features to create a logical model:

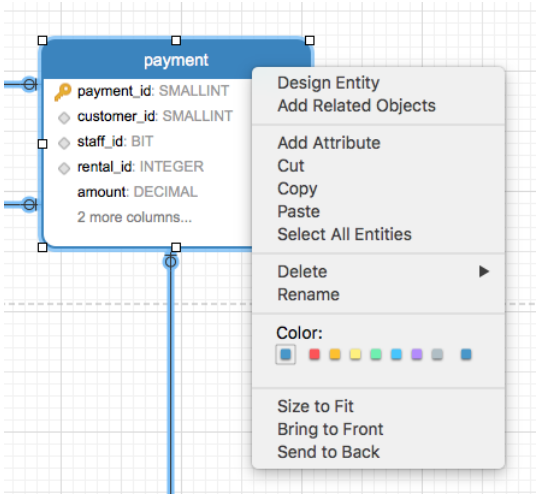
- Import from Database - reverse engineer from existing databases/schemas or ODBC data source.
- Model Conversion - convert from a physical/conceptual model.

Add Entities to Logical Model

To add a new entity, click the **Entity** button from the toolbar and click anywhere on the canvas. To add an existing entity from the Explorer's Model tab, simply drag and drop the selected entity from the Model tab to the canvas.

For Default diagram notation, the icon means the attribute is a primary key. The icon indicates that the attribute serves as an index.

Note: If you control-click an attribute, you can choose to add, insert, delete, rename the attribute and set the attribute as primary key.



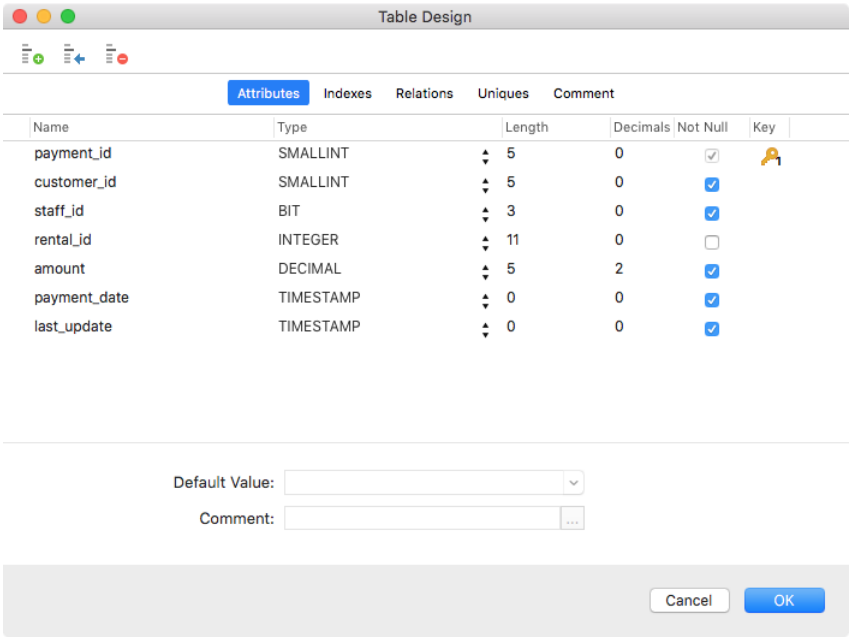
The pop-up menu options of the entity object in the canvas include:

Option	Description
Design Entity	Edit the entity structure in an **Entity Designer**, e.g. attributes and relations.
Add Related Objects	Add all related objects to the selected entity.
Add Attribute	Add attributes to the existing entity.
Cut	Remove the entity from the diagram and put it on the clipboard.
Copy	Copy the entity from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Entities	Select all entities in the diagram.
Delete	Delete an entity from the diagram or from both diagram and model.
Rename	Change the name of the entity.
Color	Change the color of the entity.
Size to Fit	Resize the entity automatically to fit its contents.
Bring to Front	Bring the entity to the foreground.
Send to Back	Move the entity to the background.

Entity Designer

Entity Designer is the basic Navicat Data Modeler tool for working with entities. It allows you to create, edit and drop entity's attributes, relations, etc.

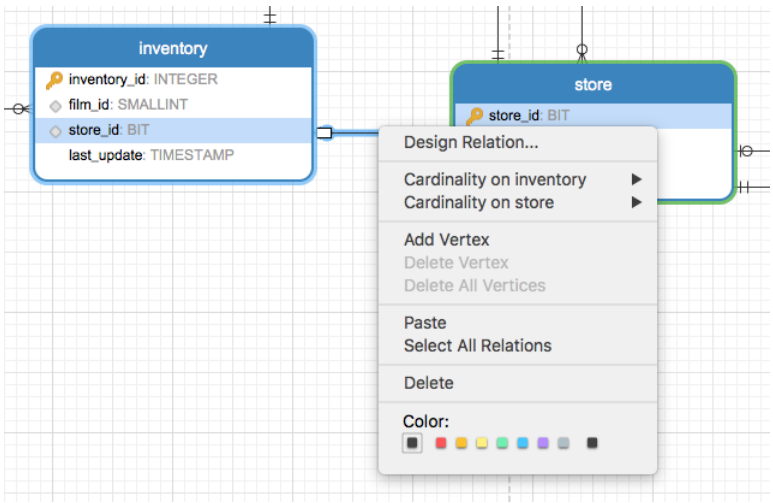
In the **Attributes** tab, you can search an attribute name by pressing COMMAND-F.



Add a Relation to a Logical Model

To add a relation, click the **Relation** button from the toolbar and drag and drop an attribute from the child entity to the parent entity. To show/hide the linked name label, simply check/uncheck the **Show name** option in the Properties pane.

When you move your mouse over a relation connector, the border of the parent and the child entities turn to green and blue respectively. Also, the referenced attributes and the referencing attributes are highlighted.



The pop-up menu options of the relation in the canvas include:

Option	Description
Design Relation	Edit the relation in an Entity Designer.
Cardinality on entity_name1	Set the cardinality on entity_name1: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.
Cardinality on entity_name2	Set the cardinality on entity_name2: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.
Add Vertex	Add a vertex on a relation connector.

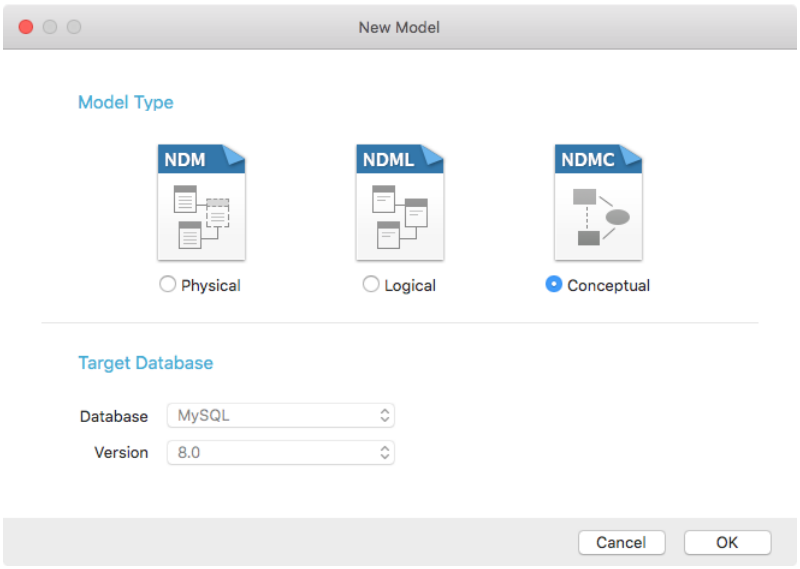
Delete Vertex	Delete a vertex on a relation connector.
Delete All Vertices	Delete all vertices on a relation connector.
Paste	Paste the content from the clipboard into the diagram.
Select All Relations	Select all relations in the diagram.
Delete	Delete a relation from both diagram and model.
Color	Change the color of the relation.

Chapter 6 - Conceptual Models

Create Conceptual Models

Navicat Data Modeler allows you to create conceptual models, including entities and relations.

To create a conceptual model, choose **File** -> **New** from the menu bar. In the **New Model** window, choose **Conceptual** as **Model Type**.

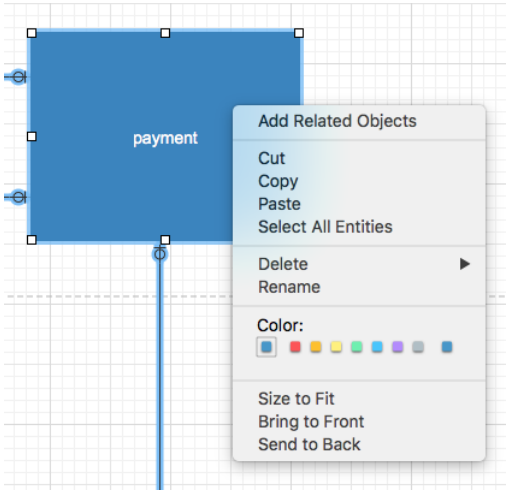


You can also use the following features to create a conceptual model:

- Import from Database - reverse engineer from existing databases/schemas or ODBC data source.
- Model Conversion - convert from a physical/logical model.

Add Entities to Conceptual Model

To add a new entity, click the **Entity** button from the toolbar and click anywhere on the canvas. To add an existing entity from the Explorer's Model tab, simply drag and drop the selected entity from the Model tab to the canvas.



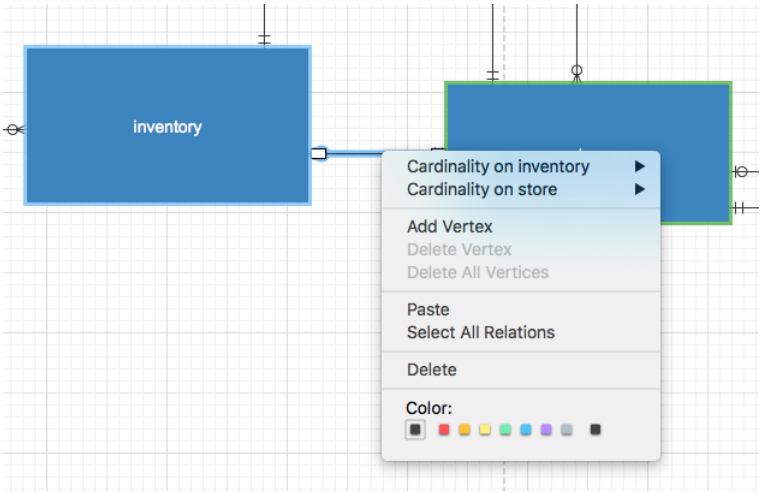
The pop-up menu options of the entity object in the canvas include:

Option	Description
Add Related Objects	Add all related objects to the selected entity.
Cut	Remove the entity from the diagram and put it on the clipboard.
Copy	Copy the entity from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Entities	Select all entities in the diagram.
Delete	Delete an entity from the diagram or from both diagram and model.
Rename	Change the name of the entity.
Color	Change the color of the entity.
Size to Fit	Resize the entity automatically to fit its contents.
Bring to Front	Bring the entity to the foreground.
Send to Back	Move the entity to the background.

Add Relations to Conceptual Model

To add a relation, click the **Relation** button from the toolbar and drag the child entity and drop to the parent entity. To show/hide the linked name label, simply check/uncheck the **Show name** option in the Properties pane.

When you move your mouse over a relation connector, the border of the parent and the child entities turn to green and blue respectively.



The pop-up menu options of the relation in the canvas include:

Option	Description
Cardinality on entity_name1	Set the cardinality on entity_name1: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.
Cardinality on entity_name2	Set the cardinality on entity_name2: None, One and Only One, Many, One or Many, Zero or One, Zero or Many.
Add Vertex	Add a vertex on a relation connector.
Delete Vertex	Delete a vertex on a relation connector.
Delete All Vertices	Delete all vertices on a relation connector.

Paste	Paste the content from the clipboard into the diagram.
Select All Relations	Select all relations in the diagram.
Delete	Delete a relation from both diagram and model.
Color	Change the color of the relation.

Chapter 7 – Diagram Layout

Work with Diagram Canvas

Show Grid

To turn the grid on in the diagram canvas, choose **Diagram** -> **Show Grid Lines** from the menu.

Snap to Grid

To align objects on the canvas with the grid, choose **Diagram** -> **Snap to Grid** from the menu.

Change Diagram Notation

To change the notation of the diagram, choose **Diagram** -> **Diagram Notation** from the menu.

Note: The options depend on the diagram type you are chosen.

Option	Description
Default	The default notation style used in Navicat Data Modeler.
Simple	A simple notation style. The table, view or entity objects will only show the name.
IDEF1X	The ICAM DEFinition language information modeling method.
UML	Universal Modeling Language style.
IE (Crow's Foot)	Crow's Foot notation style.
Black and White	Change the color of the diagram to black and white.
Show Schema Name	Show the schema names of the tables and views in the diagram.
Show View Relationships	Show the relationship lines of views in the diagram.
Show Table Comments	Show the table comments in the diagram.
Show Entity Comments	Show the entity comments in the diagram.
Show Field Comments	Show the field comments in the diagram.

Change Diagram Dimensions

To change the number of pages used in the diagram, choose **Diagram** -> **Diagram Dimensions** from the menu bar and set the **Width** and the **Height**.

Align Objects

To align objects on the canvas, select more than one object (tables, entities, views, notes, labels, images or shapes), then control-click and select **Alignment** -> **Align Left**, **Align Center**, **Align Right**, **Align Top**, **Align Middle** or **Align Bottom**.

Change Objects Distribution

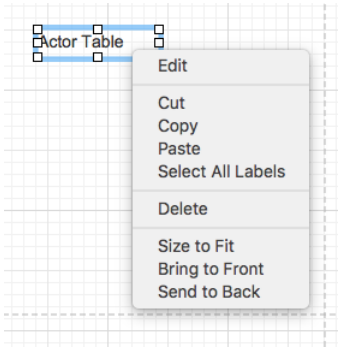
To distribute objects on the canvas, select more than one object (tables, entities, views, notes, labels, images or shapes), then control-click and select **Distribute** -> **Horizontal** or **Vertical**.

Change Page Setup

To change paper size, orientation and margins, choose **File** -> **Page Setup**.

Add Labels

Labels are typically used to help document the diagram design process. For example, to explain a grouping table objects. To add a new label, click the **Label** button from the toolbar and click anywhere on the canvas.

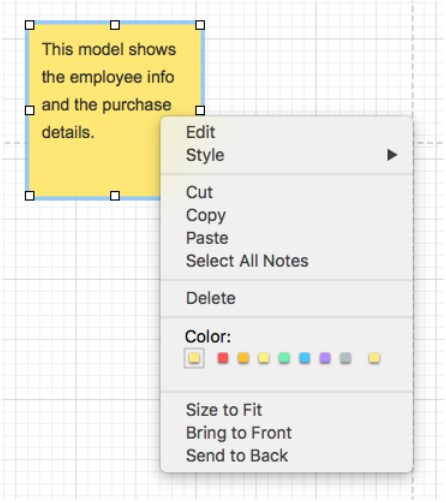


The pop-up menu options of the label object in the canvas include:

Option	Description
Edit	Change the content of the label.
Cut	Remove the label from the diagram and put it on the clipboard.
Copy	Copy the label from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Labels	Select all labels in the diagram.
Delete	Delete a label from the diagram.
Size to Fit	Resize the label automatically to fit its contents.
Bring to Front	Bring the label to the foreground.
Send to Back	Move the label to the background.

Add Notes

Notes are typically used to help document the diagram design process. For example, to explain a grouping table objects. To add a new note, click the **Note** button from the toolbar and click anywhere on the canvas.

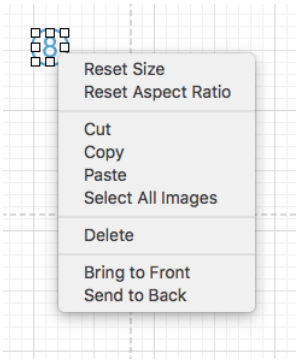


The pop-up menu options of the note object in the canvas include:

Option	Description
Edit	Change the content of the note.
Style	Change the style of the note: Note or Label.
Cut	Remove the note from the diagram and put it on the clipboard.
Copy	Copy the note from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Notes	Select all notes in the diagram.
Delete	Delete a note from the diagram.
Color	Change the color of the note.
Size to Fit	Resize the note automatically to fit its contents.
Bring to Front	Bring the note to the foreground.
Send to Back	Move the note to the background.

Add Images

You can insert images (BMP, JPG, JPEG or PNG files) to your model for design or identification purposes. To add a new image, click the **Image** button from the toolbar and click anywhere on the canvas. Then, select an image file in the Open dialog box.

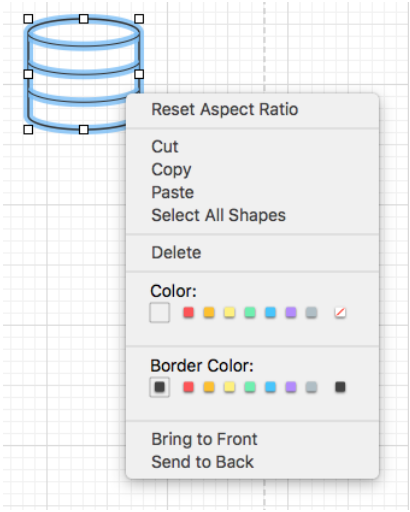


The pop-up menu options of the image object in the canvas include:

Option	Description
Reset Size	Reset the size of the image to its original size.
Reset Aspect Ratio	Maintain the image original width to height ratio.
Cut	Remove the image the diagram and put it on the clipboard.
Copy	Copy the image from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Images	Select all images in the diagram.
Delete	Delete an image from the diagram.
Bring to Front	Bring the image to the foreground.
Send to Back	Move the image to the background.

Add Shapes

Navicat Data Modeler includes some pre-defined shapes for creating database model diagrams: line, arrow, rectangle, ellipse, user, database, cloud, trigger, server, desktop or mobile. To add a new shape, click the **Shape** button from the toolbar and choose the type of shape. Then, click anywhere on the canvas. To show/hide the linked name label, simply check/uncheck the **Show name** option in the Properties pane.



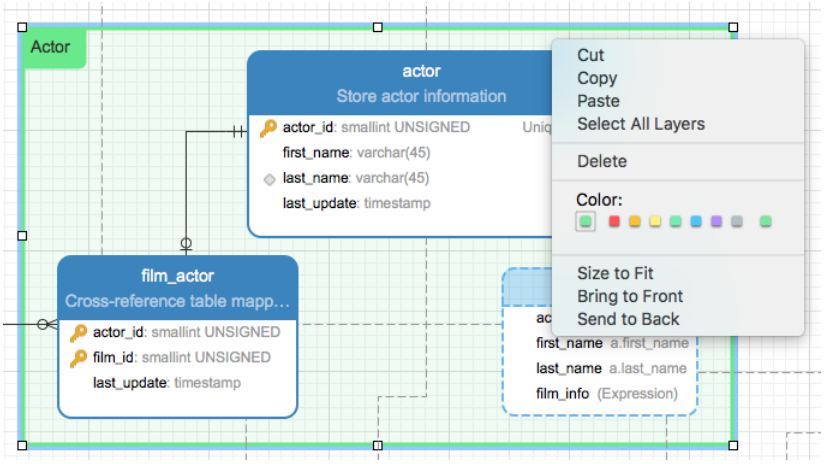
The pop-up menu options of the shape object in the canvas include:

Option	Description
Reset Aspect Ratio	Maintain the shape original width to height ratio. Only for rectangle, ellipse, user, database, cloud, trigger, server, desktop and mobile.
Add Vertex	Add a vertex on a line or arrow. Only for line and arrow.
Delete Vertex	Delete a vertex on a line or arrow. Only for line and arrow.
Delete All Vertices	Delete all vertices on a line or arrow. Only for line and arrow.
Cut	Remove the shape from the diagram and put it on the clipboard.

Copy	Copy the shape from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Shapes	Select all the shapes in the diagram.
Delete	Delete a shape from the diagram.
Color	Change the color of the shape.
Border Color	Change the color of the shape's border. Only for rectangle, ellipse, user, database, cloud, trigger, server, desktop and mobile.
Bring to Front	Bring the shape to the foreground.
Send to Back	Move the shape to the background.

Add Layers

Layers are used to help organize objects (e.g. tables, notes, images, etc) on the canvas. You can add all related objects to the same layer. For example, you may choose to add all your sales related tables to one layer. To add a new layer, click the **Layer** button from the toolbar and click anywhere on the canvas.



The pop-up menu options of the layer object in the canvas include:

Option	Description
Cut	Remove the layer from the diagram and put it on the clipboard.
Copy	Copy the layer from the diagram to the clipboard.
Paste	Paste the content from the clipboard into the diagram.
Select All Layers	Select all layers in the diagram.
Delete	Delete a layer from the diagram.
Color	Change the color of the layer.
Size to Fit	Resize the layer automatically to fit its contents.
Bring to Front	Bring the layer to the foreground.
Send to Back	Move the layer to the background.

Chapter 8 - Reverse Engineering (Available only in Non-Essentials Version)

Import from Database

The **Import from Database** feature allows you to load already existing database structures to create new diagrams. It supports to import MySQL, MariaDB, PostgreSQL, Oracle, SQLite, SQL Server tables/views, and also from ODBC data source. If the model is logical or conceptual, all views will covert to entities after the import process. To start the Import from Database wizard, choose **File** -> **Import from Database** or **New from Database** from the menu bar.

If it is the first time you open the wizard, you require to establish your server connection before selecting the connection. Click the **Manage Connection** button to create, edit or delete connections.

Create Connection

Click ✚ to start the setup.

- MySQL/MariaDB/PostgreSQL/Oracle/SQLite/SQL Server
- ODBC

Note: Navicat Data Modeler authorizes you to make connection to remote server running on different platform, i.e. Windows, macOS, Linux and UNIX.

Edit Connection

To edit a connection information

1. Select an existing connection.
2. Click ✎.

Delete Connection

To delete a connection

1. Select an existing connection.
2. Click ━.

Import Connection Settings

To import Navicat (e.g. Navicat Premium) connection settings

1. Click ⤓.
2. Select the connections and click **OK**.

Note: Available only when Navicat (e.g. Navicat Premium) is installed in the current machine. If the connection exists, the newly created connection will be named as e.g. "connection_name Copy #".

Choose Objects

You are allowed to choose databases, schemas, tables or views to import. If your diagram is logical and conceptual, views will be imported as entities.

Start Import

Click **Import** to start the import process.

Database Connections

Connect to Database Servers

You can create a connection to connect your server: MySQL, MariaDB, PostgreSQL, Oracle, SQLite, SQL Server.

Note: The tabs in the connection properties window depend on the database type you are chosen.

- General Settings
- Advanced Settings
- Databases Settings
- SSL Settings
- SSH Settings
- HTTP Settings

General Settings

To successfully establish a new connection to local/remote server - no matter via SSL, SSH or HTTP, set the database login information in the General tab. If your Internet Service Provider (ISP) does not provide direct access to its server, Secure Tunneling Protocol (SSH) / HTTP is another solution.

Note: The following options depend on the connection server type and sort in ascending order.

Add to

After you logged in the Navicat Cloud feature, you can choose to save the connection to My Connections or a project in Navicat Cloud.

Authentication

SQL Server Authentication	Use login records to validate the connection. Users must provide their server login: **User Name** and **Password**.

Windows Authentication	When a user connects through a Windows user account, SQL Server validates the account name and password using the Windows principal token in the operating system.

Connection Name

Enter a friendly name to best describe your connection.

Connection Type

Basic	In Basic mode, it connects to Oracle through the Oracle Call Interface (OCI). Enter the **Host** and **Port**. Set the **Service Name/SID** which the user connects when making connection. Select the corresponding radio button.
TNS	In TNS mode, it connects to Oracle server using an alias entry from a tnsnames.ora file through the Oracle Call Interface (OCI). User needs to provide the **Net Service Name**.

OCI is an application programming interface that allows an application developer to use a third-generation language's native procedure or function calls to access the Oracle database server and control all phases of SQL statement execution. OCI is a library of standard database access and retrieval functions in the form of a dynamic-link library. See also: Environments

Database File

Specify the initial database file. If the HTTP Tunnel is enabled, you need to enter an absolute file path of the database file in your web server.

Host

A host name where the database is situated or the IP address of the server.

Initial Database

Set the initial database which user connects when making connection.

OS authentication

Use OS user login credentials to authenticate database users.

Password

Password for connecting to the database server.

Port

A TCP/IP port for connecting to the database server.

Role

Indicate that the database user is connecting with either the Default, SYSOPER or SYSDBA system privilege.

Sync User Name with Navicat Cloud

When editing a connection in Navicat Cloud, you can choose to synchronize the user name.

Type

Existing Database File	Connect to an existing database in the **Database File**.
New SQLite 3	Create a new SQLite 3 database in the **Database File**.
New SQLite 2	Create a new SQLite 2 database in the **Database File**.

User Name

User name for connecting to the database server.

Advanced Settings

Note: The following options depend on the connection server type and sort in ascending order.

Client Character Set

Choose the session client character set used in Navicat Data Modeler.

Encoding

Choose a codepage for converting data to display in Navicat Data Modeler UI.

Encrypt

Enable this option and provide **Password** when connecting to an encrypted SQLite database.

Keepalive interval (sec)

Keep the connection with the server alive by pinging it. You can set the period between pings in the edit box.

TDS Version

Choose the TDS protocol version supported by your server if the connection runs into an incompatibility.

Use compression

Use compression protocol. It is used if both client and server support zlib compression, and the client requests compression.

Use socket file

Use socket file for localhost connection.

Databases Settings

MySQL, Oracle, PostgreSQL, SQL Server, MariaDB

In the **Databases** tab, you can set which databases will be shown in the Import from Database window. It is not obligatory. To start working with custom database settings, check **Use custom database list**. Then, check the preferable databases in the **Name** column.

Add a hidden database to the list

1. Click the **+** button.
2. Enter the database name.
3. Check the newly added database in the database list.

Remove a database from the list

1. Select the database in the database list.
2. Click the **-** button.

Note: The database will be just removed from the database list box, it will still exist in the server.

SQLite

In the **Databases** tab, you can attach SQLite database files to the connection. Click the **+**button and enter the information:

Option	Description
Database Name	Enter the database name which displays in Navicat Data Modeler.
Database File	Choose the file path of a database file.
Encrypt	Check this option and provide the **Password** if the database file is encrypted.

To detach a database, select it from the list and click the **-** button.

SSL Settings

Secure Sockets Layer (SSL) is a protocol for transmitting private documents via the Internet. To get a secure connection, the first thing you need to do is to install OpenSSL Library and download Database Source.

Note: Available only for MySQL, PostgreSQL and MariaDB. Support from PostgreSQL 8.4 or later.

MySQL and MariaDB Connections

To provide authentication details, enable **Use authentication** and fill in the required information:

Client Key File

The SSL key file in PEM format to use for establishing a secure connection.

Client Certificate File

The SSL certificate file in PEM format to use for establishing a secure connection.

CA Certificate File

The path to a file in PEM format that contains a list of trusted SSL certificate authorities.

Specified Cipher

A list of permissible ciphers to use for SSL encryption.

PostgreSQL Connection

Choose the **SSL Mode**:

allow	First try a non-SSL connection; if that fails, try an SSL connection.
prefer	First try an SSL connection; if that fails, try a non-SSL connection.
require	Only try an SSL connection.
verify-ca	Only try an SSL connection, and verify that the server certificate is issued by a trusted CA.
verify-full	Only try an SSL connection, verify that the server certificate is issued by a trusted CA and that the server hostname matches that in the certificate.

To provide authentication details, enable **Use authentication** and fill in the required information:

Client Certificate File

The path of the client certificate.

Client Key File

The path of the client private key.

Root Certificate File

The path of the trusted certificate authorities.

Certificate Revocation List File

The file path of the SSL certificate revocation list (CRL).

SSH Settings

Secure SHell (SSH) is a program to log in into another computer over a network, execute commands on a remote server, and move files from one machine to another. It provides strong authentication and secure encrypted communications between two hosts, known as **SSH Port Forwarding (Tunneling)**, over an insecure network. Typically, it is employed as an encrypted version of Telnet.

In a Telnet session, all communications, including username and password, are transmitted in plain-text, allowing anyone to listen-in on your session and steal passwords and other information. Such sessions are also susceptible to

session hijacking, where a malicious user takes over your session once you have authenticated. SSH serves to prevent such vulnerabilities and allows you to access a remote server's shell without compromising security.

Note: Available only for MySQL, Oracle, PostgreSQL, SQL Server and MariaDB.

Please make sure that the parameter - "AllowTcpForwarding" in the Linux server must be set to value "yes", otherwise, the SSH port forwarding will be disabled. To look for the path: /etc/ssh/sshd_config. By default, the SSH port forwarding should be enabled. Please double check the value settings.

Even the server support SSH tunnel, however, if the port forwarding being disabled, Navicat Data Modeler cannot connect via SSH Port 22.

Host

A host where SSH server is activated.

Note: The host name in the General tab should be set relatively to the SSH server which provided by your database hosting company.

Port

A port where SSH server is activated, by default it is 22.

User Name

A user on SSH server machine. (It is not a user of database server.)

Authentication Method

Password	Provide the SSH server user **Password**.
Public Key	**Private Key** It is used together with your public key. The private key should be readable only by you. **Passphrase** A passphrase is exactly like a password, except that it applies to the keys you are generating and not an account.

Note: HTTP Tunnel and SSH Tunnel cannot be function simultaneously. The SSH Tunnel is disabled when you select the HTTP Tunnel and vice versa.

HTTP Settings

HTTP Tunneling is a method for connecting to a server that uses the same protocol (http://) and the same port (port 80) as a web server does. It is used while your ISPs do not allow direct connections, but allows establishing HTTP connections.

Note: Available only for MySQL, PostgreSQL, SQLite and MariaDB.

Uploading the Tunneling Script

To use this connection method, first thing you need to do is to upload the tunneling script to the web server where your server is located.

Note: Click the **Export Tunnel Script** button to extract the script file, **ntunnel_mysql.php** (for both MySQL and MariaDB), **ntunnel_pgsql.php**, **ntunnel_sqlite.php**.

Setting up HTTP Tunnel

The following instruction guides you through the process of configuring a HTTP connection.

1. Select the HTTP tab and enable **Use HTTP tunnel**.
2. Enter URL of the tunneling script, e.g. http://www.navicat.com/ntunnel_mysql.php .
3. If the tunneling script is hosted in a password protected server, you can provide the required authentication details.
4. If your server installed a Web Application Firewall, you can check the **Encode outgoing query with base64** option.
5. If you have to access internet over a proxy server, click the **Proxy Settings** button and provide the details.

Note: HTTP Tunnel and SSH Tunnel cannot be function simultaneously. The SSH Tunnel is disabled when you select the HTTP Tunnel and vice versa.

ODBC Connections

You can create an ODBC connection to connect your ODBC data source. The following instruction guides you through the process of creating a new ODBC connection.

Setting Up an ODBC Data Source Connection

1. To setup the connection of the data source, you need to install the corresponding driver.
2. Then, setup the DSN (Data Source Name) using the ODBC Administrator.

Note: You can consult with the driver provider about how to setup the DSN.

Connecting to ODBC data source in Navicat Data Modeler

Connection Name

A friendly name to best describe your connection.

Data Source

A data source name.

User Name

User name for connecting to the data source.

Password

Password for connecting to the data source.

Chapter 9 - Forward Engineering (Available only in Non-Essentials Version)

Forward Engineer Physical Model

Navicat Data Modeler provides two forward engineering tools for you to generate physical databases or a script file from a physical model.

- Synchronize to Database - compare and synchronize to an actual database.
- Export SQL - generate a SQL file with customized settings.

Synchronize to Database

The **Synchronize to Database** feature allows you to compare a model with an existing database or schema, states the differences between their structures, and offers synchronizing the structures in model to the target connection. To start the Synchronize to Database wizard, choose **File** -> **Synchronize to Database** from the menu bar.

Note: This feature is only available for Physical Models.

Choose Connections

The first step is to define connections, databases and/or schemas for the source model and the target connection.

You can click the **Manage Connection** button to view and edit connections in Navicat Data Modeler. See Database Connections for details.

Choose Comparing Options

Then, click the **Options** button to select the comparing options for the synchronization process.

Note: The following options depend on the diagram database type you are chosen.

Compare auto increment value

Check this option if you want to compare the auto increment values of tables.

Compare character set

Check this option if you want to compare the character sets of tables.

Compare checks

Check this option if you want to compare checks.

Compare collation

Check this option if you want to compare the collations of tables.

Compare definers

Check this option if you want to compare the definers of views.

Compare excludes

Check this option if you want to compare excludes.

Compare foreign keys

Check this option if you want to compare table foreign keys.

Compare identity last value

Check this option if you want to compare the identity last values of tables.

Compare indexes

Check this option if you want to compare indexes.

Compare owners

Check this option if you want to compare the owners of the objects.

Compare partitions

Check this option if you want to compare table partitions.

Compare primary keys

Check this option if you want to compare table primary keys.

Compare rules

Check this option if you want to compare rules.

Compare storage

Check this option if you want to compare table storages.

Compare table options

Check this option if you want to compare other table options.

Compare tables

Check this option if you want to compare tables.

Compare triggers

Check this option if you want to compare triggers.

Compare uniques

Check this option if you want to compare uniques.

Compare views

Check this option if you want to compare views.

Drop with CASCADE

Check this option if you want to drop the dependent database objects with the CASCADE option.

Identifier Case Sensitivity

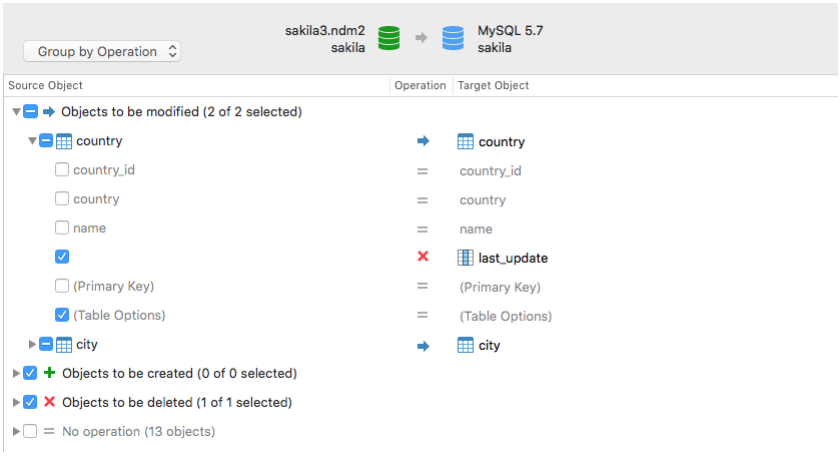
Ignore or consider the case of identifiers when mapping, or use the server default setting.

Start Comparison

Click the **Compare** button to compare the source model and the target database.

View Comparison Result

After comparing structures, the tree view shows the differences between the source and target databases or schemas. All objects are checked in the tree view by default. Uncheck the objects you do not want to apply to the target. You can expand the table objects to view the detailed structure.

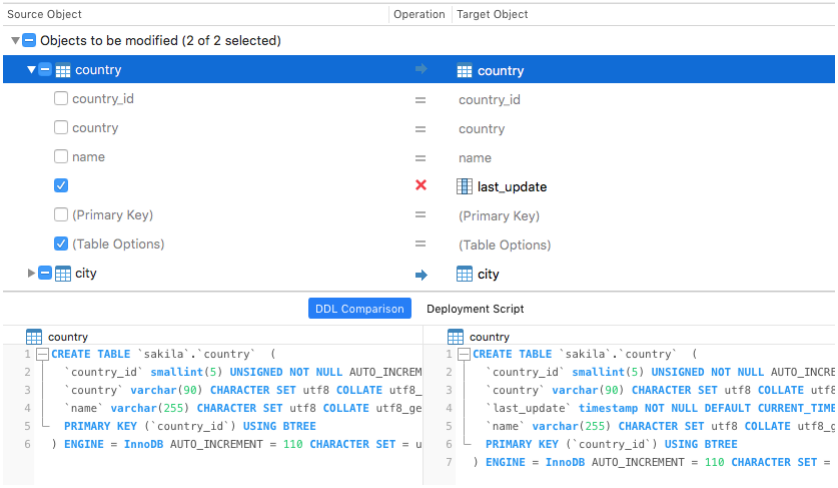


You can choose to group the objects in the tree views by object types or operations by selecting **Group by Object Type** or **Group by Operation**.

Operation	Description
➡	Object exists in both source and target databases/schemas, but they have different definition. The target object will be modified based on the source object.
✚	Object does not exist in the target database/schema. It will be created in the target.

✖	Object does not exist in the source database/schema. The target object will be deleted.
=	Object exists in both source and target databases/schemas and they have identical definition. No operation will be applied.

When you selected an object in the tree view, the **DDL Comparison** tab shows the DDL statements of that object in the source and the target, and the **Deployment Script** tab shows the detailed SQL statements of the object that will be executed in the target databases.



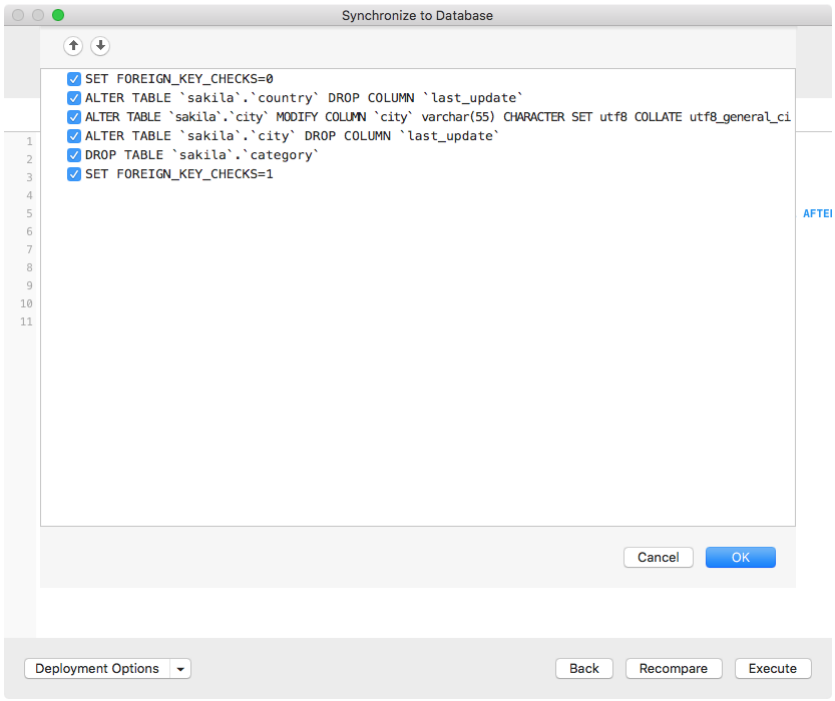
Click the **Deploy** button to show the scripts of all selected objects.

Edit & Execute Selected Scripts

You can view all scripts that will be executed in the target database in the **Deployment Script** tab.

Deployment Options Button	Description
Deployment Options	**Continue on error** - Ignore errors that are encountered during the execution process if necessary.
Edit Script	Open the **Edit Deployment Script** window to rearrange the order of the scripts.
Copy Script to Clipboard	Copy all scripts from the Deployment Script tab to the clipboard.

In the **Edit Deployment Script** window, use the arrow buttons to move the scripts.



Then, click the **Execute** button to execute the scripts. The window will display the execution progress, execution time, and success or failure messages.

Export SQL

After finishing your model, you can save table structures and relations from the model into a script file. The **Export SQL** feature generates a SQL file for the script. To start the Export SQL feature, choose **File** -> **Export SQL** from the menu bar.

Note: This feature is only available for Physical Models.

General Properties

Export to File

Set the output file name and location.

Select objects to export

Choose objects in the model you wish to export.

Advanced Properties

Note: The following options depend on the diagram database type you are chosen.

Drop with CASCADE

Include drop object SQL statements with the CASCADE option in the SQL file with this option in on.

Include auto increment

Include table auto increment in the SQL file with this option is on.

Include character set

Include table and field character set in the SQL file with this option is on.

Include checks

Include checks in the SQL file with this option is on.

Include collation

Include table collation in the SQL file with this option is on.

Include Drop SQL

Include drop object SQL statements in the SQL file with this option in on.

Include excludes

Include excludes in the SQL file with this option is on.

Include foreign keys

Include foreign keys in the SQL file with this option is on.

Include indexes

Include indexes in the SQL file with this option is on.

Include primary keys

Include primary keys in the SQL file with this option is on.

Include rules

Include rules in the SQL file with this option is on.

Include schema name

Include the schema names in the SQL file with this option is on. Otherwise, only object names are included in SQL statements.

Include triggers

Include triggers in the SQL file with this option is on.

Include uniques

Include uniques in the SQL file with this option is on.

Server Version

Select the server version for the SQL file.

Chapter 10 – Other Advanced Tools

Useful Features

Navicat Data Modeler provides variety of tools that improve user experience when working on models.

- Model Conversion
- Auto Layout
- Print and Export Model
- Search Filter
- Full Screen Mode

Model Conversion

Navicat Data Modeler allows you to convert your models from one database type to another database type and also from one model type to another model type, e.g. MariaDB 10.0 physical model to PostgreSQL 9.0 physical model, Oracle 10g physical model to a logical model, a conceptual model to MySQL 5.0 physical model.

During the conversion, all data types are converted automatically. The conversion process does not change the SQL syntax of views if converting from one database type to another. If you covert a physical model to logical/conceptual model, all views will be converted to entities. If the target database version is MySQL 4.0 or below, all views will be removed.

To convert an opened model file, choose **File** -> **Convert Model To**. Then, choose the **Model Type** and select the target **Database** and **Version** if necessary.

Auto Layout (Available only in Non-Essentials Version)

To automatically arrange objects on the canvas, click the  **Auto Layout** button. To change the Auto Layout format settings, simply choose **Diagram** -> **Auto Layout With** from the menu and set the following options:

Space Between Objects

The distance between the objects in the diagram.

Number of Trials

The quality of the auto layout output.

Auto Dimension

Choose the suitable diagram dimension automatically.

Tables resize to fit

Resize the table to fit its content automatically.

Print & Export Model

Print to a printer

Choose **File** -> **Print** to send your diagram directly to the printer. You can set the printer option in the pop-up window.

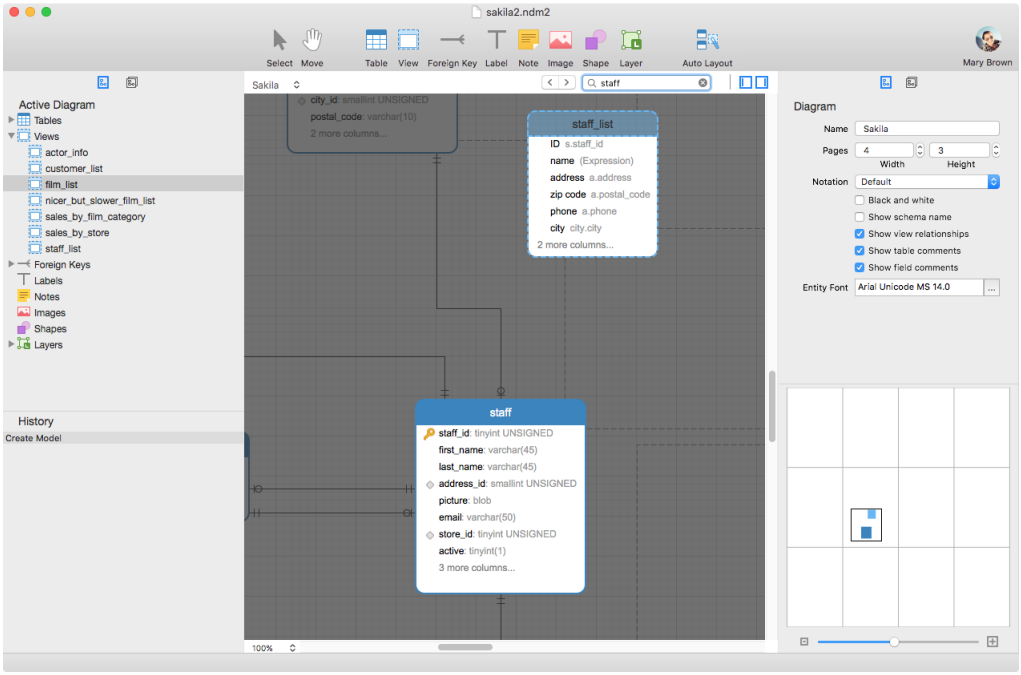
Export to a file

Choose **File** -> **Export To** and choose the file format to create a PDF, PNG, SVG or JPG file of your diagram.

Search Filter

Object Filter allows you to filter models in Navicat Cloud Window, the tree structure in View Designer and tables, entities or views in the canvas that names contain the filter string.

Just specify a filter string in the **Search** text box. To remove the filter, simply delete the filter string.



Full Screen Mode

Edit the model using the whole screen. The menu bar and title bar that normally display as part of the Navicat Data Modeler application will be hidden while in this mode. Move your mouse cursor to the top of the screen, the menu bar and title bar will show automatically.

Choose **View** -> **Enter Full Screen** in the menu bar or simply press CTRL-COMMAND-F to start the full screen mode.

When the full screen mode is cancelled, the Navicat Data Modeler window will be returned to its previous state.

Chapter 11 – Configurations

Preferences Settings

Navicat Data Modeler provides several options for customizing its user interface and performance.

To open the Preferences window, choose **Navicat Data Modeler** -> **Preferences** from the menu bar.

General

Usage Data

Share Usage Data

Check this option to let your device sends us information about how you use Navicat Data Modeler to help us improve it. You can view the information being shared by clicking the **Usage Data** button.

Update

Automatically check for updates

Check this option to allow Navicat Data Modeler checks for new version automatically at a selected time.

Include anonymous system profile

Check this option to send us your system information, such as your macOS version to improve our Navicat Data Modeler when it checks for updating.

Tabs

Open Tabs

Open new tab in

Set new pop-up windows to open as:

Option	Description
Last Tab Window	Open a new tab in the last opened window.
New Window	Open a new window.

Allow opening multiple forms for same object

Check this option to allow opening multiple instances of an object.

Tab Bar Style

Always show the tab bar

Always show the tab bar when you open a window.

Editor

Disable syntax highlight and code completion if SQL larger than: ☐ MB

The highlighting and code completion features can be limited by setting the maximum file size (e.g. 10) to increase performance.

Show

Show line number

Display line numbers at the side of the editor for easily reference.

Use code folding

Code folding allows codes to collapse as a block and only the first line displayed in the editor.

Use brace highlighting

Highlight the pair of braces when your cursor moves to either one brace for easily reference.

Use syntax highlighting

Syntax highlight helps viewing codes clearly. Codes are highlighted in the editor with different colors and fonts according to the categories they belong to.

Text Layout

Tab Width: ☐ spaces

Enter the number of characters that a tab occupies, e.g. 5.

Use word wrap

Enable the word wrap mode in the editor.

Font and Colors

Font

Define the font and its size used by the editor.

Use default font

Check this option to use the default font settings.

Syntax Colors

Format your queries in the editor with colored syntax highlighting to improve readability. Set font colors to mark out different text fragments: Common, Keyword, String, Number, Comment and Background. Click on the color boxes and choose your desired color from the Colors dialog window.

Query

Code Completion

Use code completion

When you type the . (dot) symbol or a character, the editor will offer you a pop-up list that showing some suggestions for the code completion.

Auto update code completion info

With this option is on, Navicat Data Modeler will get the latest database information for the code completion from your model. You can click **Clear Code Completion Info** to delete the information for code completion feature that stored on your device.

Models

Guess field types

With this option is on, Navicat Data Modeler will predict field types when you design fields/attributes in tables or entities.

Highlight objects

With this option is on, when a mouse cursor hovers over an object, Navicat Data Modeler will highlight its border with blue color.

Highlight table with relations

With this option is on, when a mouse cursor hovers over a table, a entity or a view, Navicat Data Modeler will highlight it's foreign keys, relations or view relations with blue or green color indicating relationships with other objects.

Environment

Hint: Restart Navicat Data Modeler to take effect.

Executables

SQLite3 Dynamic Library Path

Specify the location for SQLite3 Dynamic Library.

OCI Environment

DYLD_LIBRARY_PATH

Specify the location which contains Oracle libraries for instant client and SQL*Plus (e.g. ORACLE_HOME/lib). Always required.

Use bundled instant client

Oracle Instant Client has already included in Navicat Data Modeler. Check this option to use the bundled one in Navicat Data Modeler, e.g. /Applications/Navicat Data Modeler.app/Contents/OCI.

Oracle Instant Client is the simplest way to deploy a full Oracle Client application built with OCI, OCCI, JDBC-OCI, or ODBC drivers. It provides the necessary Oracle Client libraries in a small set of files. You can also download Oracle Instant Client through -

Oracle Instant Client

Download the appropriate Instant Client packages for your platform and the CPU. All installations REQUIRE the Basic or Basic Lite package. Unzip the packages and set the path points to it.

ORACLE_HOME

Specify the location of ORACLE_HOME for full client only. Instant client should leave it blank.

TNS_ADMIN

Specify the location of the tnsnames.ora file (e.g. ORACLE_HOME/network/admin). It is optional. Required when using TNS connection.

Chapter 12 – Hints and Tips

Model Hints and Tips

Navicat Data Modeler provides some useful hints to work on the model more effectively.

Locate Object in the Diagram Canvas

Object selected in the Explorer's Diagram tab will be highlighted in the Diagram Canvas.

Double-click an object in the Explorer's Diagram tab will jump to the corresponding object in the Diagram Canvas.

Delete Object from Model

Select an object in the Diagram Canvas and press SHIFT-DELETE.

Open Table/Entity/View Designer

Double-click a table/entity/view in the Explorer's Model Tab or the Diagram Canvas.

Get Table/View Structure (SQL Statement)

Select and copy a table/view in the Diagram Canvas, and paste it to other text editors.

Design Field without Table/Entity Designer

Select and click a table/entity name and press DOWN ARROW to add/edit fields. Navicat Data Modeler will predict field types according to field names you entered.

Note: Available only for Physical Models and Logical Models.

INTEGER/int/int4/NUMBER

- suffix "id", "no" (if it is the first column, it will be predicted as a primary key)
- suffix "num"
- "qty", "number"
- exactly "age", "count"

DECIMAL(10,2)/decimal(10,2)/NUMBER/REAL/money

- suffix "price", "cost", "salary"

FLOAT/double/float8/NUMBER/REAL/float

- "size", "height", "width", "length", "weight", "speed", "distance"

DATE/datetime/date/TEXT/datetime2

- "date", "time"

VARCHAR(255)/varchar(255)/VARCHAR2(255)/TEXT

- other field names

Enter * before the field name to recognize as primary key. e.g. *itemNo:int.

Enter : between field name and field type to custom field type, e.g. itemName:varchar(255).

Reorder Field

Select a table/entity in Diagram Canvas, then press and hold the SHIFT key. Use  to drag the field to a desired location.

Delete Field

Select a table/entity in Diagram Canvas, then press and hold the SHIFT key. Use  to drag the desired field out of the table/entity.

Add Vertex to Foreign Key/Relation/Line/Arrow

Select a foreign key/relation/line/arrow in Diagram Canvas. Press and hold the SHIFT key and click on it to add vertex.

Delete Vertex on Foreign Key/Relation/Line/Arrow

Select a foreign key/relation/line/arrow in Diagram Canvas. Press and hold the SHIFT key and click on the vertex.

Switch to Hand Mode

Press and hold the SPACE key, then move the diagram.

Chapter 13 – Hot Keys

Model Hot Keys

Keys	Action
COMMAND-N	New Model
COMMAND-O	Open Model
SHIFT-COMMAND-O	Open Model from Navicat Cloud
COMMAND-D	New Diagram in Model
COMMAND-S	Save Model
SHIFT-COMMAND-S	Save Model As
OPTION-COMMAND-T	Show / Hide Toolbar
COMMAND-Z	Undo
SHIFT-COMMAND-Y	Redo
COMMAND-X	Cut
COMMAND-C	Copy
COMMAND-V	Paste
COMMAND-SHIFT-V	Paste from Clipboard Stack
CTRL-COMMAND-F	Full Screen
COMMAND-P	Print
SHIFT-COMMAND-P	Page Setup
ESC	Select
H	Move Diagram
T	New Table/Entity
V	New View
R	New Foreign Key/Relation
A	New Label
N	New Note
I	New Image
L	New Layer
COMMAND-B	Bold Selected Table, Entity, View, Foreign Key, Relation or Shape
COMMAND-+	Zoom In
COMMAND--	Zoom Out
COMMAND-0	Reset Zoom