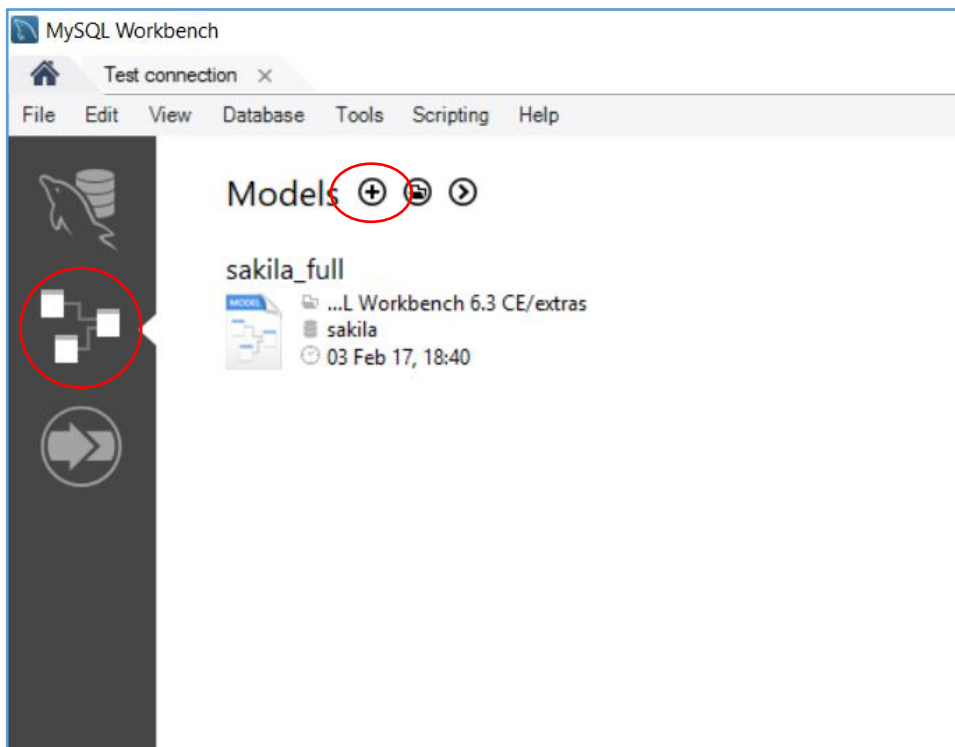


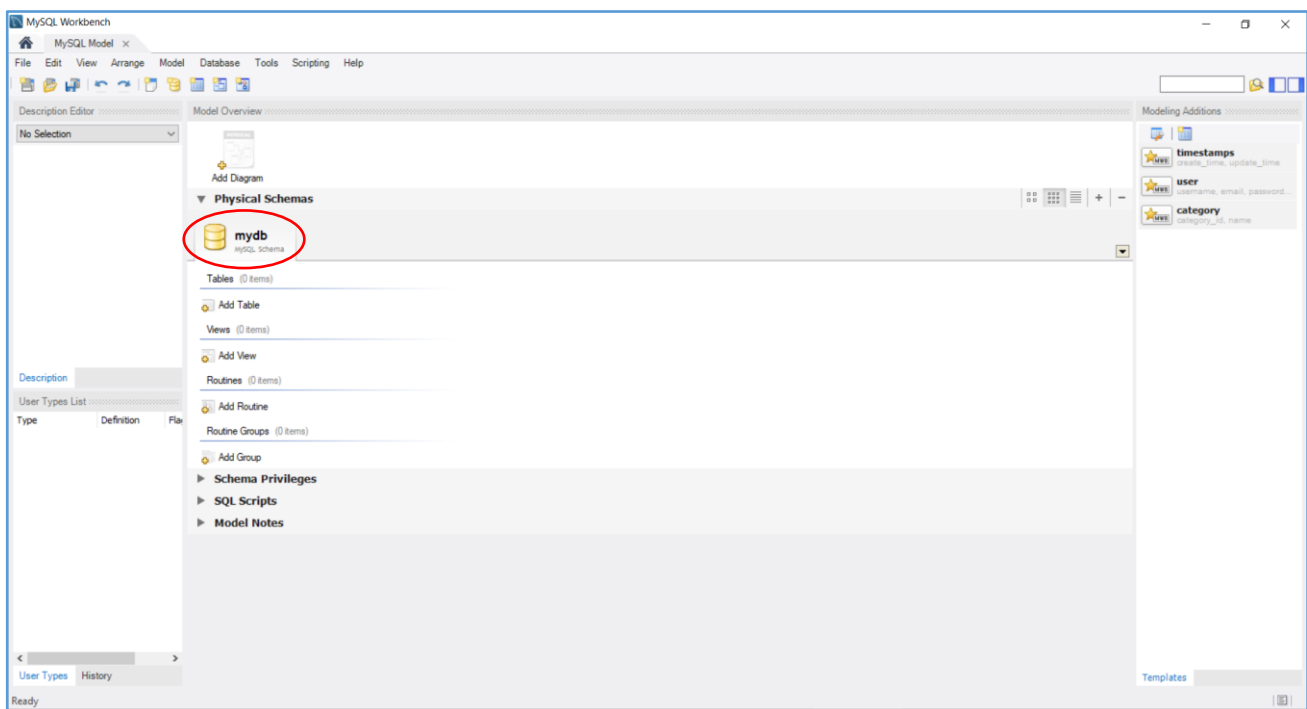
Using MySQL Workbench to create an ER model and a new database schema

Part I. Using MySQL to create an ER model

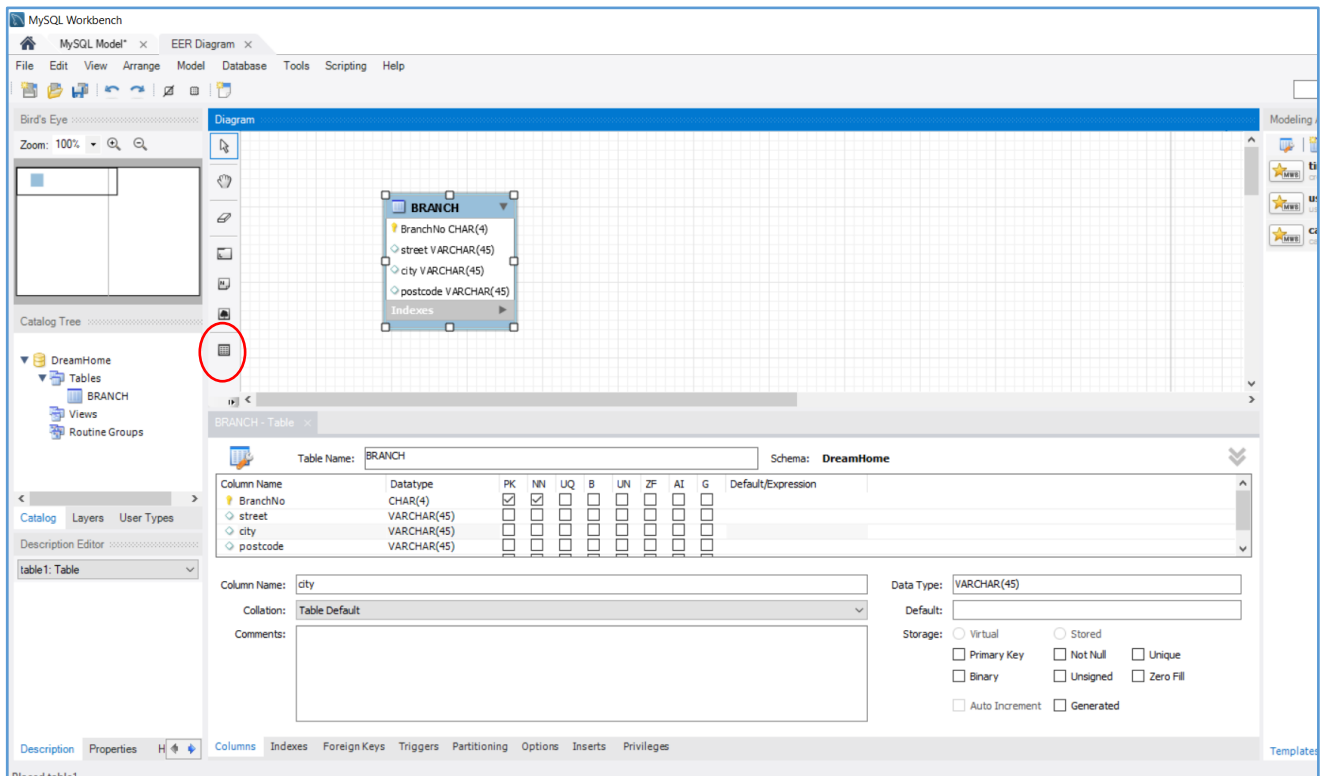
Click the “Models” tab from Workbench homepage, then click the “+” icon (Add new diagram icon) to create a new EER model.



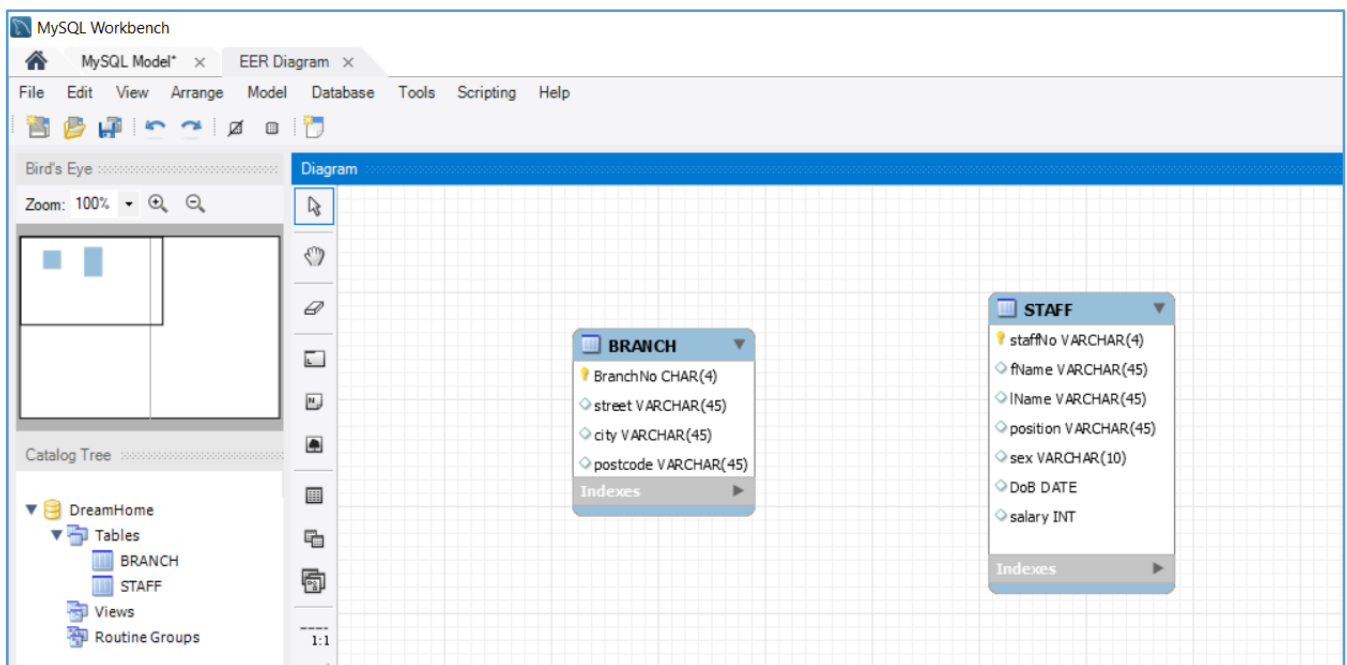
Then you will see the new model page as below. Right click on “mydb”, then choose “Edit Schema”, rename the schema to “DreamHome”.



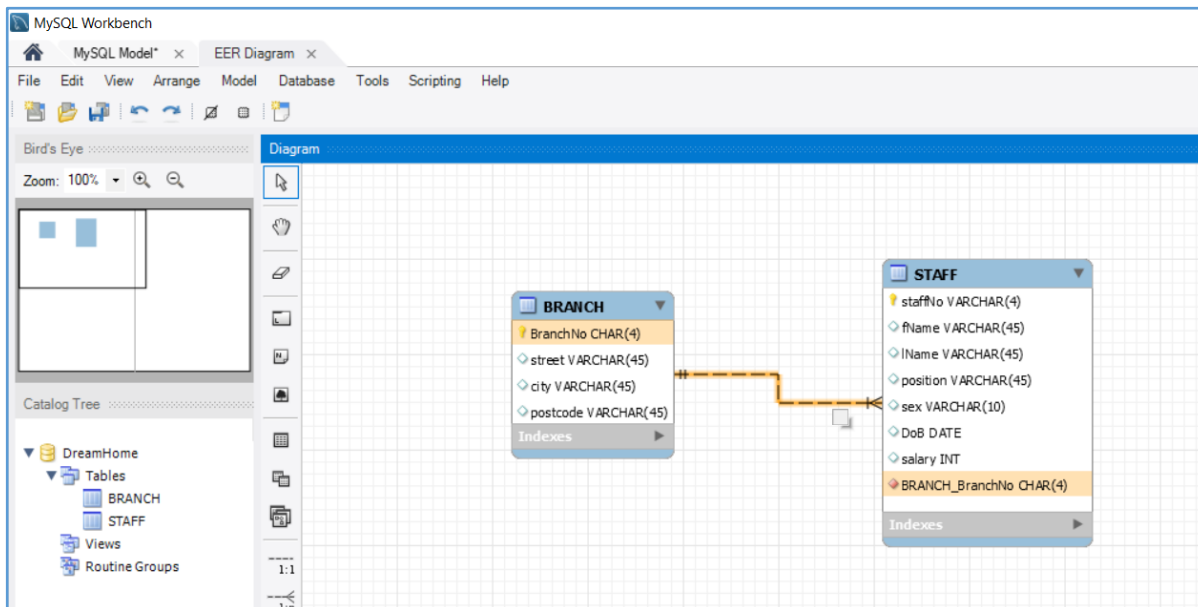
Once the schema is renamed to “DreamHome”, double-click on “Add Diagram”. In the EER Diagram view, click on the “Place a New Table” icon, and create a new table called “BRANCH” and add the attributes as below.



Following the last step, create another table called “STAFF” as below.



Adding a 1:m relationship: click on the “Place a New 1:n Non-identifying relationship” icon. Click on the “STAFF” table first, then click on the “BRANCH” table. You should see a new relationship with foreign key attribute added in “STAFF” table as below.



Note on **identifying relationship** and **non-identifying relationship** (see also <https://dev.mysql.com/doc/workbench/en/wb-relationship-tools.html>):

- An identifying relationship: identified by a solid line between tables

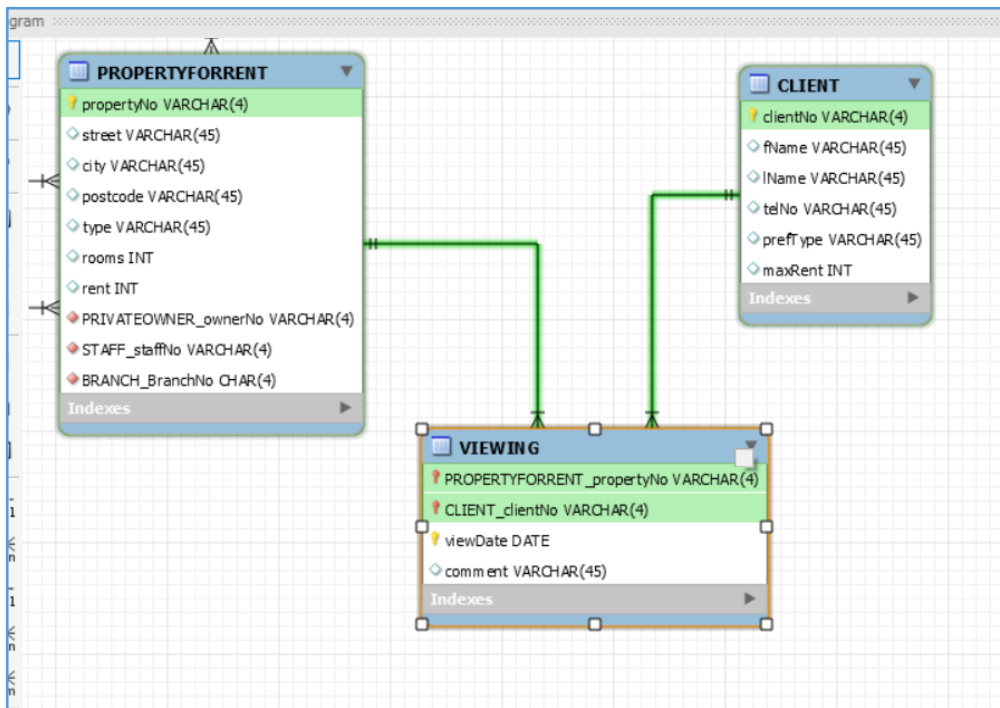
An identifying relationship is one where the child table cannot be uniquely identified without its parent. Typically this occurs where an intermediary table is created to resolve a **many-to-many** relationship. In such cases, the primary key is usually a composite key made up of the primary keys from the two original tables.

- A non-identifying relationship: identified by a broken (dashed) line between tables

Create or drag and drop the tables that you wish to connect. Ensure that there is a primary key in the table that will be on the “one” side of the relationship. Click on the appropriate tool for the type of relationship you wish to create. If you are creating a **one-to-many** relationship, first click the table that is on the “**many**” side of the relationship, then on the table containing the referenced key. This creates a column in the table on the many side of the relationship. The default name of this column is `table_name_key_name` where the table name and the key name both refer to the table containing the referenced key.

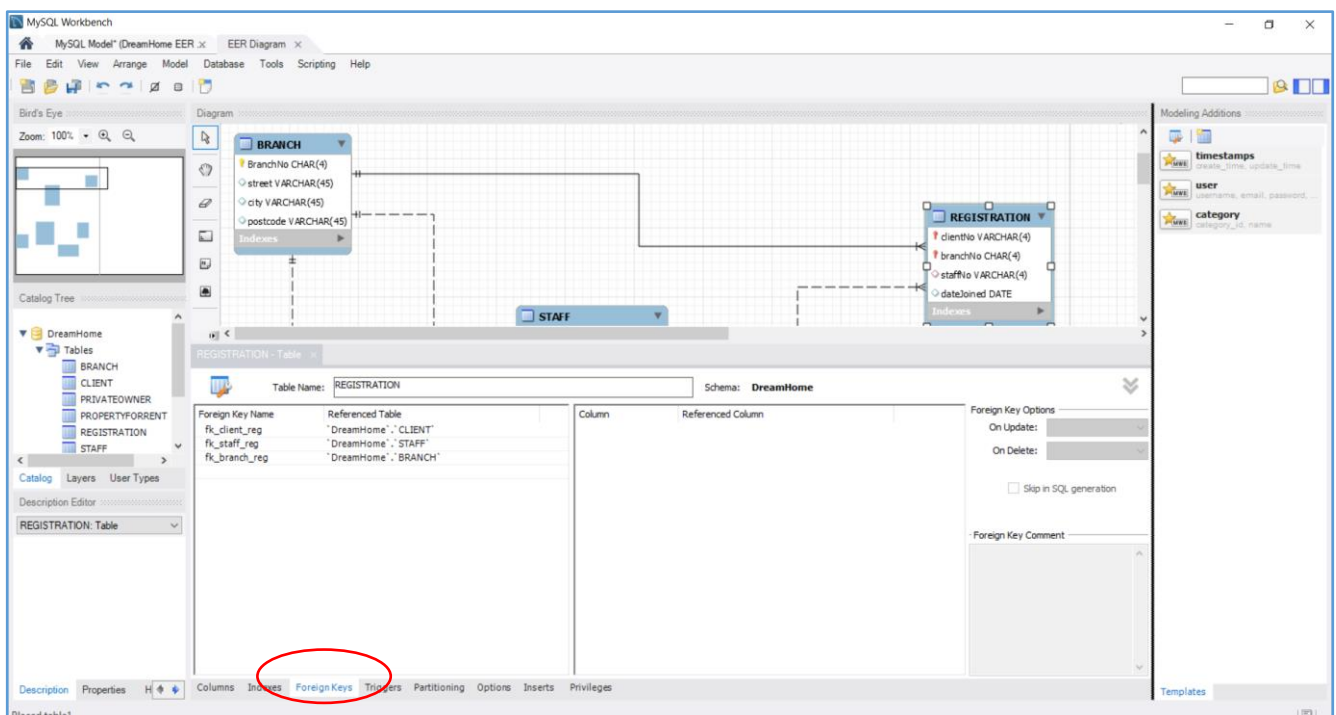
Following the steps above, create the other tables: “PROPERTYFORRENT”, “CLIENT”, “PRIVATEOWNER”, and their relationships: Private owners own properties for rent (1:m), staff are responsible for properties (1:m), properties are registered at one branch only (1:m), Clients view properties for rent (m:m).

Note when you add “m:m” relationship in MySQL Workbench, an associative relationship will be **automatically created** when you click on the two tables (entities) with many-to-many relationship. E.g. the m:m relationship of clients view properties for rent looks like this:



You need to add extra attributes related to the m:m relationship, e.g. the “viewDate” and “comment” attributes are attributes we would like to record for the associative relationship “VIEWING”. Also bear in mind if extra attributes should be made part of primary key (viewDate).

When creating the **ternary relationship** of “A client is registered at a branch by a staff member”, first creating a table in the diagram called “REGISTRATION”, then add attributes for the table: clientNo, branchNo, staffNo and dateJoined. In order to show the relationship, in the editing tab click on “Foreign keys” to add the foreign key constraints by hand. See figure below:



Then fill in the foreign key name, choose referenced table, and referenced column for each of the foreign keys as below:

Table Name: REGISTRATION		Schema: DreamHome	
Foreign Key Name	Referenced Table	Column	Referenced Column
fk_client_reg	DreamHome.CLIENT	<input checked="" type="checkbox"/> clientNo	clientNo
fk_staff_reg	DreamHome.STAFF	<input type="checkbox"/> branchNo	
fk_branch_reg	DreamHome.BRANCH	<input type="checkbox"/> staffNo	
		<input type="checkbox"/> dateJoined	

Foreign Key Options
On Update: NO ACTION
On Delete: NO ACTION
☐ Skip in SQL generation

Table Name: REGISTRATION		Schema: DreamHome	
Foreign Key Name	Referenced Table	Column	Referenced Column
fk_client_reg	DreamHome.CLIENT	<input type="checkbox"/> clientNo	
fk_staff_reg	DreamHome.STAFF	<input type="checkbox"/> branchNo	
fk_branch_reg	DreamHome.BRANCH	<input checked="" type="checkbox"/> staffNo	staffNo
		<input type="checkbox"/> dateJoined	

Foreign Key Options
On Update: NO ACTION
On Delete: NO ACTION
☐ Skip in SQL generation

Table Name: REGISTRATION		Schema: DreamHome	
Foreign Key Name	Referenced Table	Column	Referenced Column
fk_client_reg	DreamHome.CLIENT	<input type="checkbox"/> clientNo	
fk_staff_reg	DreamHome.STAFF	<input checked="" type="checkbox"/> branchNo	BranchNo
fk_branch_reg	DreamHome.BRANCH	<input type="checkbox"/> staffNo	
		<input type="checkbox"/> dateJoined	

Foreign Key Options
On Update: NO ACTION
On Delete: NO ACTION
☐ Skip in SQL generation

We *assume* that one client can be registered in different branches, but one client can only be registered by one staff for each branch. Primary key for table REGISTRATION would be clientNo and branchNo.

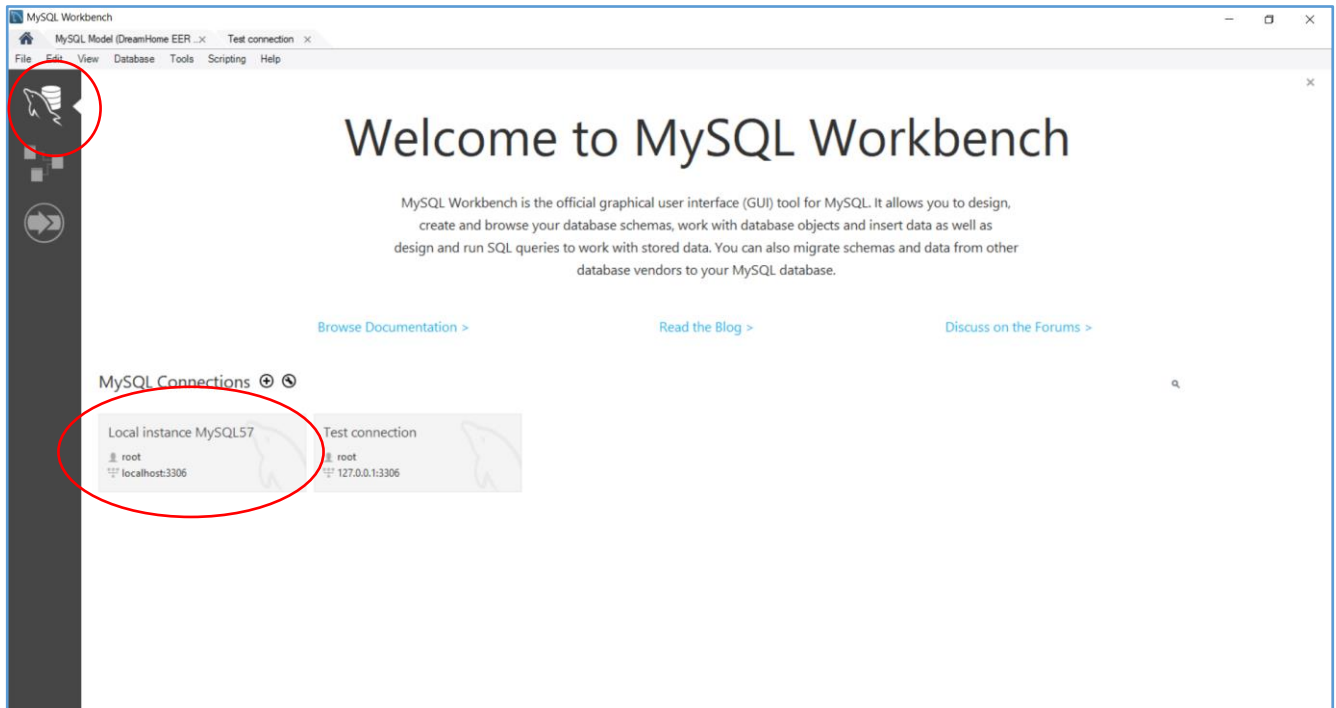
Now we have the ER diagram for DreamHome database.

Part II. Using MySQL Workbench to create a database (or “schema” as in MySQL Workbench)

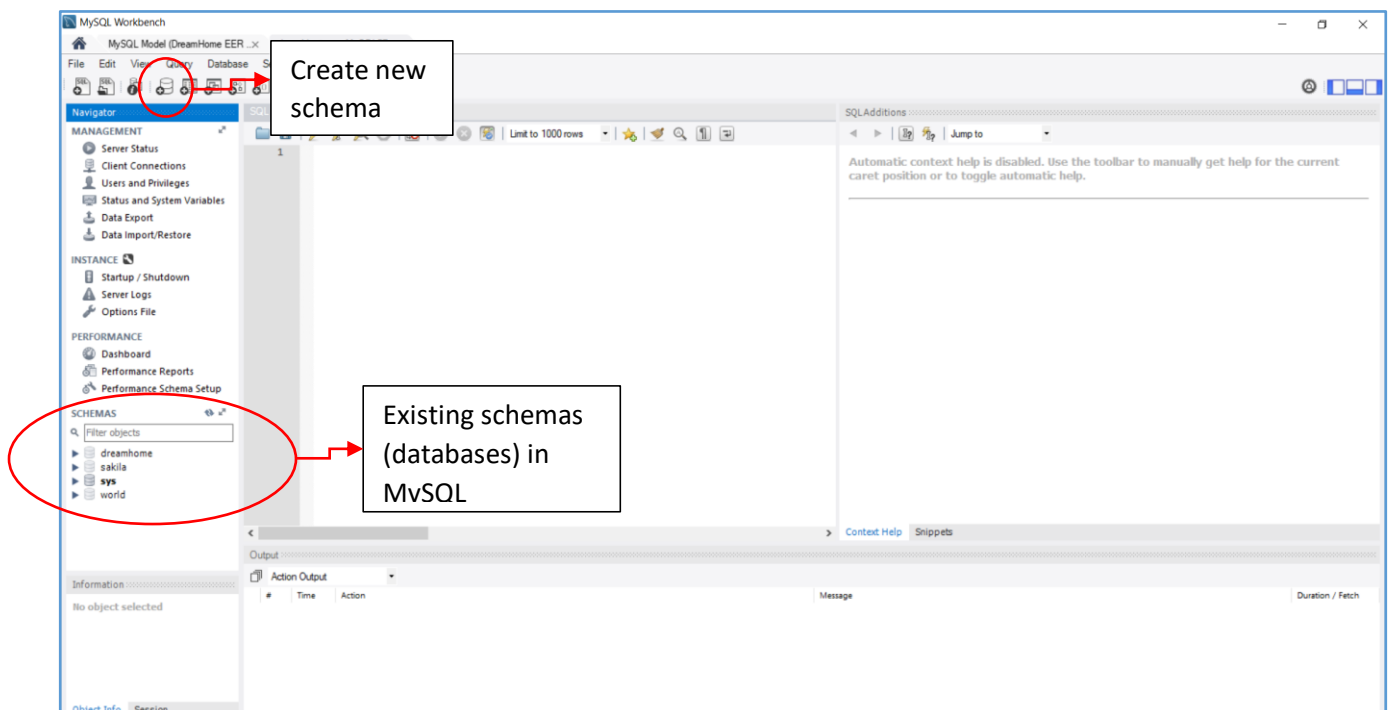
There are two different ways of creating database/schema in MySQL Workbench: 1, creating schema manually or 2, creating schema using forward engineering tool from the created ER model.

1. Creating a schema manually.

Go to “MySQL connections” in Home Screen:

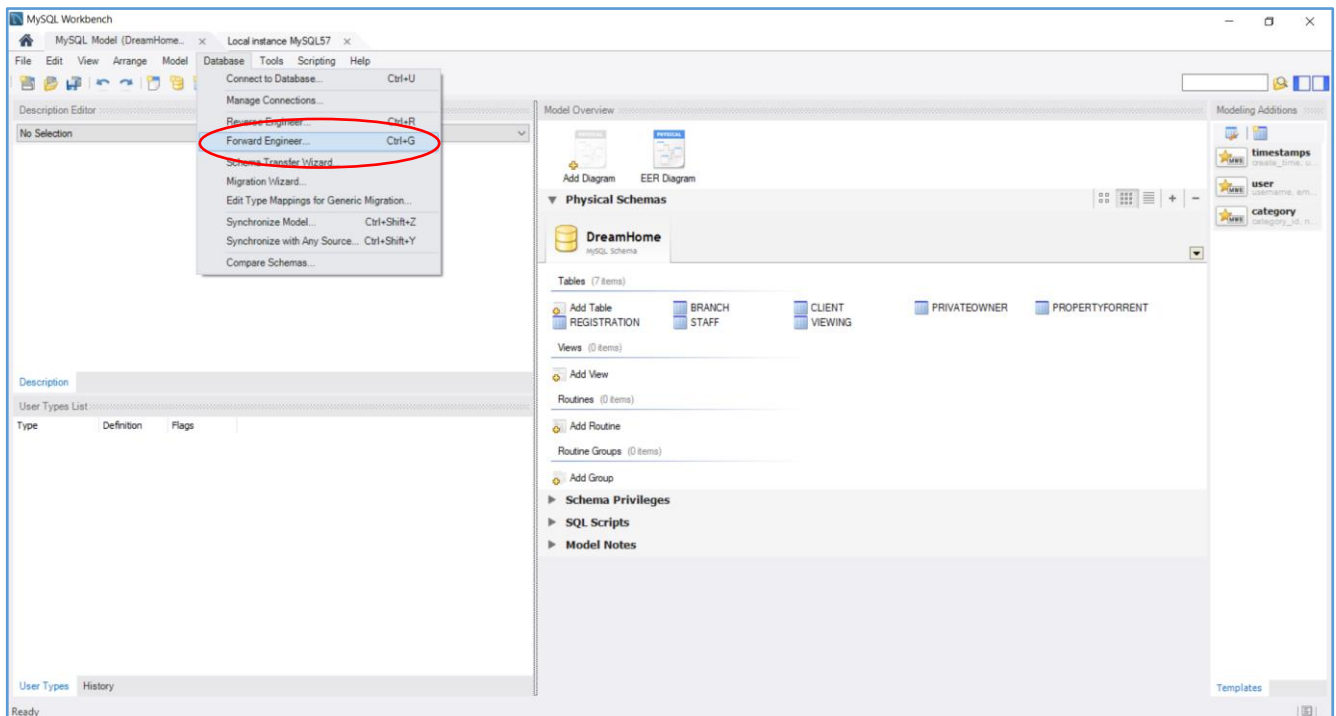


Click on a connection to establish a connection and you will see a separate tab in MySQL Workbench like the figure below. Click on the icon for “create a new schema”, then you can follow the on-screen instructions to create a schema. Once the new schema is created, click on the “Create a new table” to create all tables designed for the database schema. Note the new table will be created in the active schema in the connected server. (See also <https://dev.mysql.com/doc/workbench/en/wb-tables-physical-schemata.html>)



2. Creating a schema using “Forward engineering tool”.

Go to “DreamHome” model panel and click on the “Forward Engineer” menu choice under “Database” as figure below. Following on-screen steps and create a new database schema from existing DreamHome ER model. (See <https://dev.mysql.com/doc/workbench/en/wb-forward-engineering-live-server.html>)



Now in your connection panel, you should see the DreamHome schema as below:

