Practices for Lesson 15: Mapping Your Entity Relationship Diagram to a Relational Database Design

Chapter 15

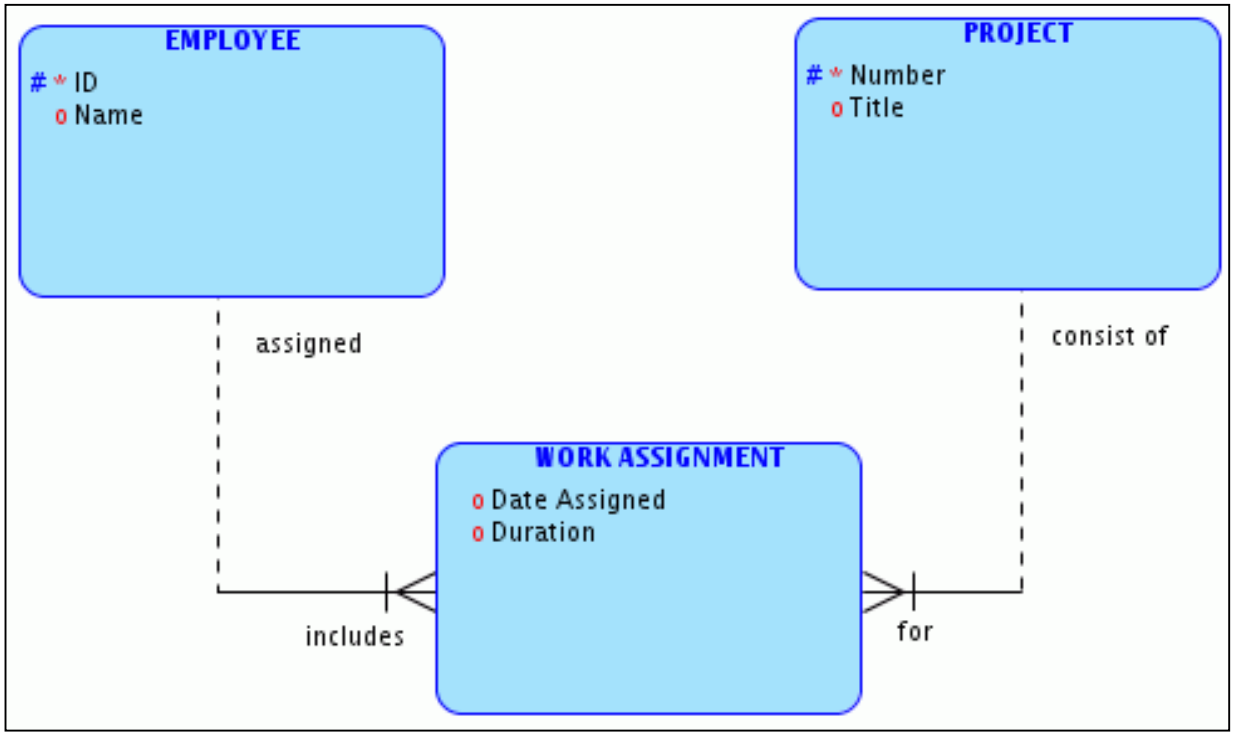
Practice 15-1: Create an Initial Relational Model

Task

For the following ERD, perform the following tasks:

1. Make sure that all attributes have a logical data type assigned.
2. Create a glossary with abbreviations for all the words in the model.
3. Associate the glossary with the model.
4. Add a short name and preferred abbreviation for each entity.
5. Run Design Rules to make sure that you do not have any errors. (Warnings are OK.)
6. Engineer the model to a relational model.
7. Change the Name template for primary keys and foreign keys to have `PK` and `FK`, respectively, as prefixes rather than suffixes.
8. Add a prefix called `OU_` for table names and apply it to the model.

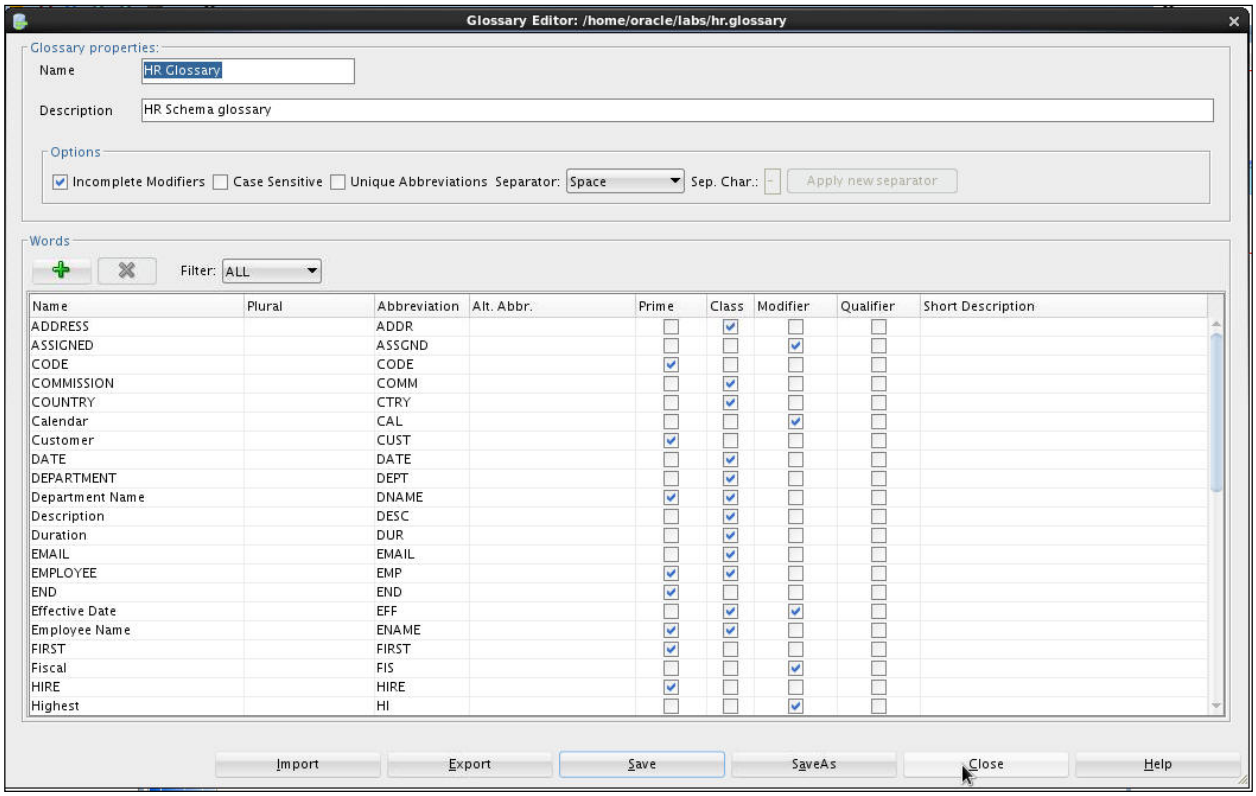
Note: You can open `sol_12_01_a.dmd` as the starting point for this practice, or you can use your completed and saved work from practice 12-1. If the logical model is not displayed, right-click the **Logical** node under the `sol_12_01_a.dmd` node, and then select **Show** from the pop-up menu. The Logical design is displayed.



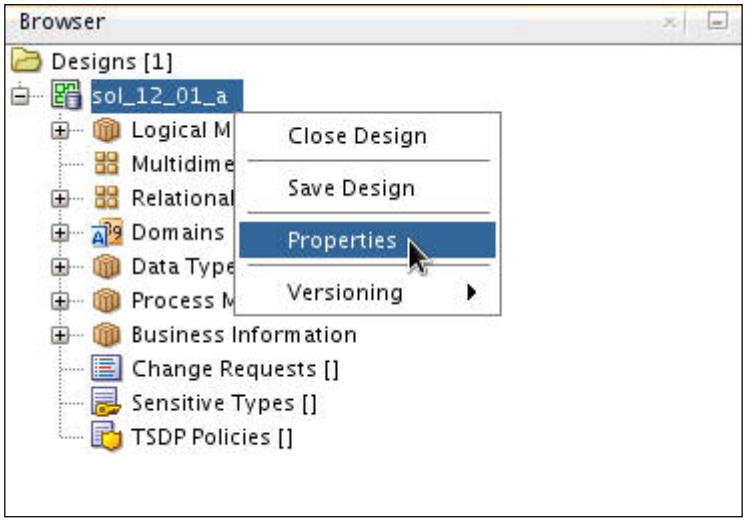
Solution 15-1: Create an Initial Relational Model

One possible solution is as follows:

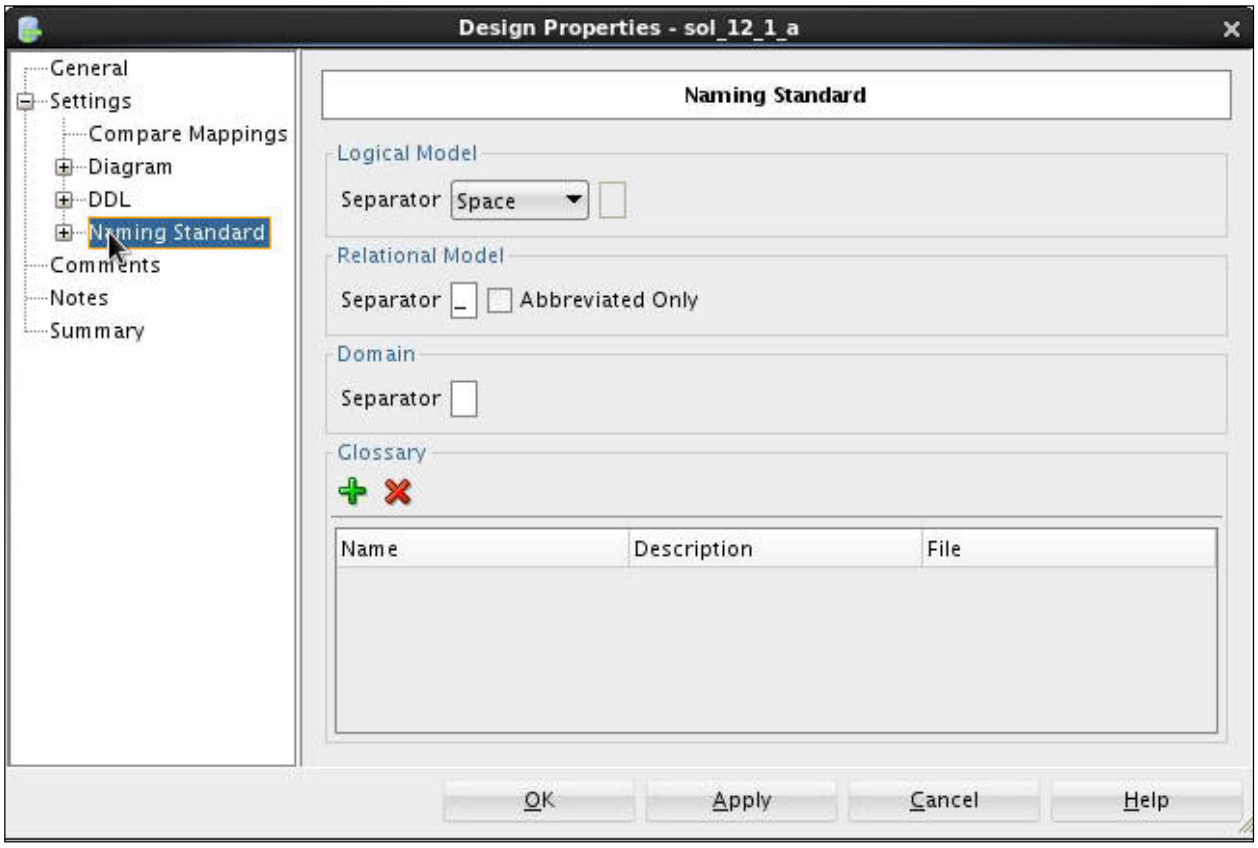
1. Open `sol_12_01_a.dmd`. The **Select Relational Models** dialog box may be displayed. Click **OK**.
2. Select **Tools > Glossary Editor**. The **Select Glossary File** dialog box is displayed.
3. Select the `hr.glossary` file in the `/home/oracle/labs/labs` directory, and then click **Open**. The **Glossary Editor** dialog box is displayed.
4. Review the Words list. When done, click **Close**.



5. In the Browser, select and right-click the design. Select **Properties**.

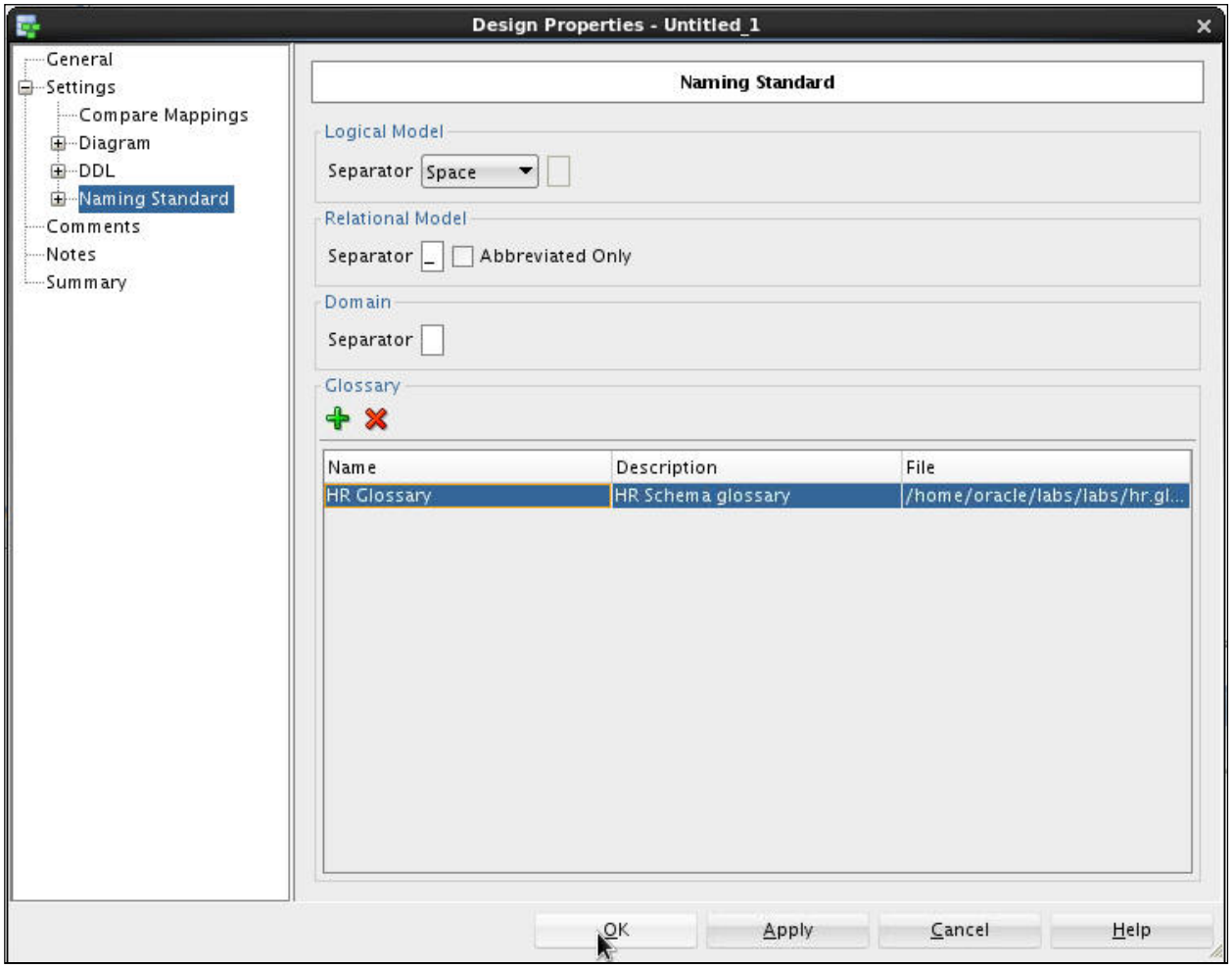


6. In the Design Properties dialog box, expand **Settings**, and then select **Naming Standard**.



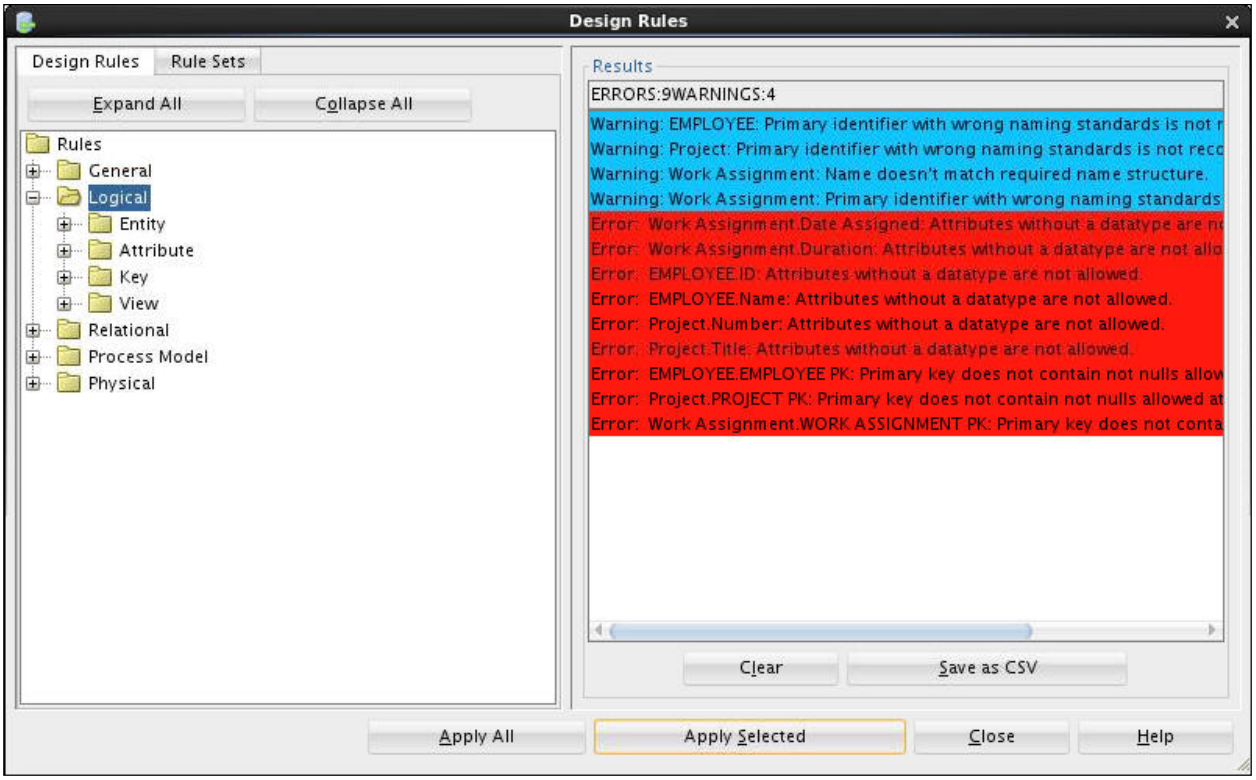
7. Click the **Add**  icon in the **Glossary** region. The **Select Glossary File** dialog box is displayed.
8. Select the `hr.glossary` file in the `/home/oracle/labs/labs` directory, and then click **Open**. The newly added glossary is displayed in the **Glossary** region.

9. Click **OK**.



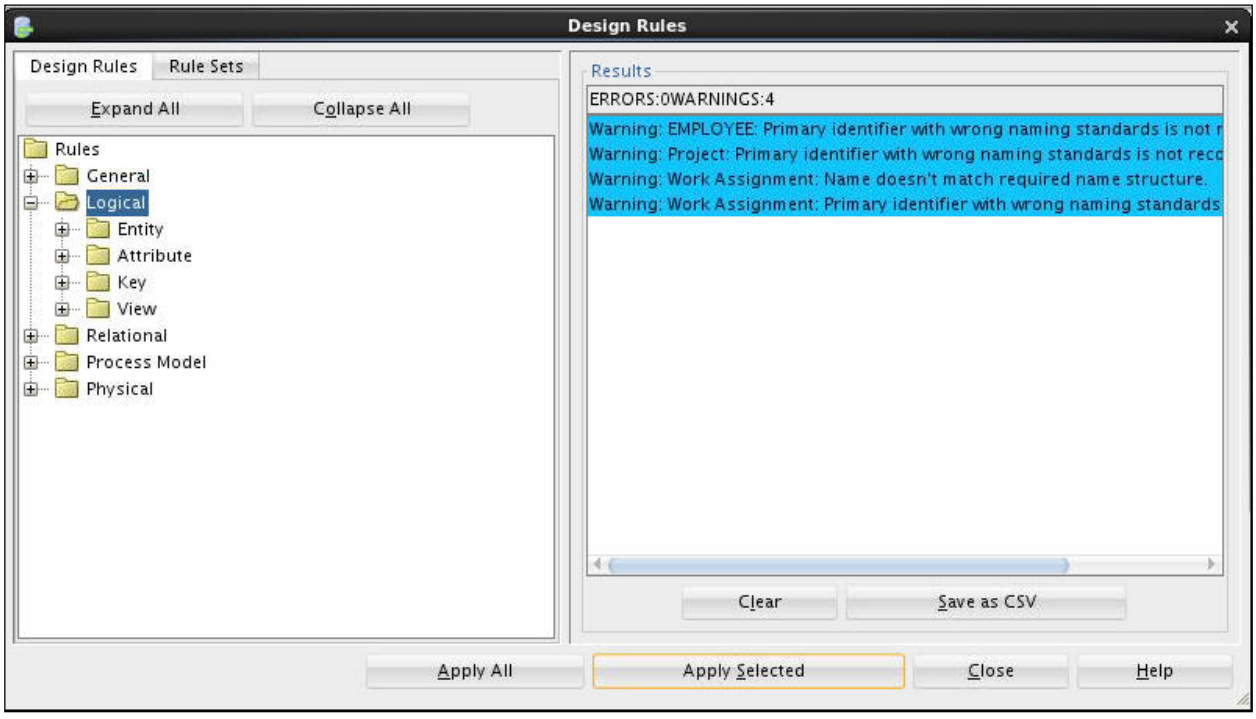
10. Select **Tools > Design Rules > Design Rules**. If you have several designs open at the same time, the **Select Relational Model** dialog box is displayed. Select the appropriate design, and then click **OK**. The **Design Rules** dialog box is displayed.
11. Click the **Logical** node, and then click **Apply Selected**.

12. Review the results. Evaluate the warnings and errors. Errors should be fixed before engineering. If you only have warnings, you may proceed with the engineer. Click **Close**.

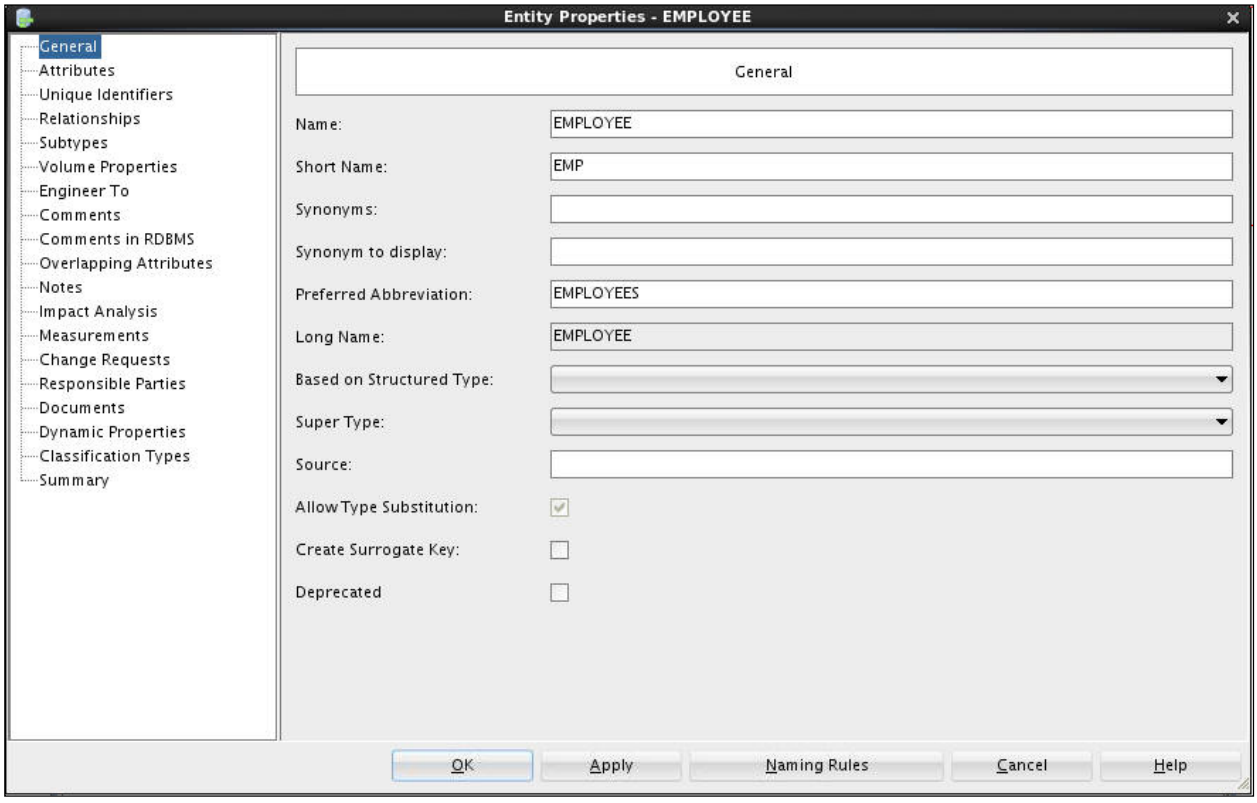


13. Correct the errors by adding the data types indicated in the following table to each of the attributes in each entity (as you did in the lesson titled "Adding and Using Data Types"). You should know how to do this, so the steps are not provided. When done, rerun the **Design Rules** so that you see what is shown in the following screenshot. Select **Tools > Design Rules > Design Rules**. Click the **Logical** node, and then click **Apply Selected**. The errors are corrected and there are only (4) warnings displayed, which is OK. Click **Close** to exit the dialog box.

Entity	Attribute	Datatype
EMPLOYEE	ID	NUMERIC(6) – Primary UID
	Name	VARCHAR (50)
PROJECT	Number	NUMERIC (6) - Primary UID
	Title	VARCHAR (50)
WORK ASSIGNMENT	Date Assigned	Date
	Duration	NUMERIC(3)



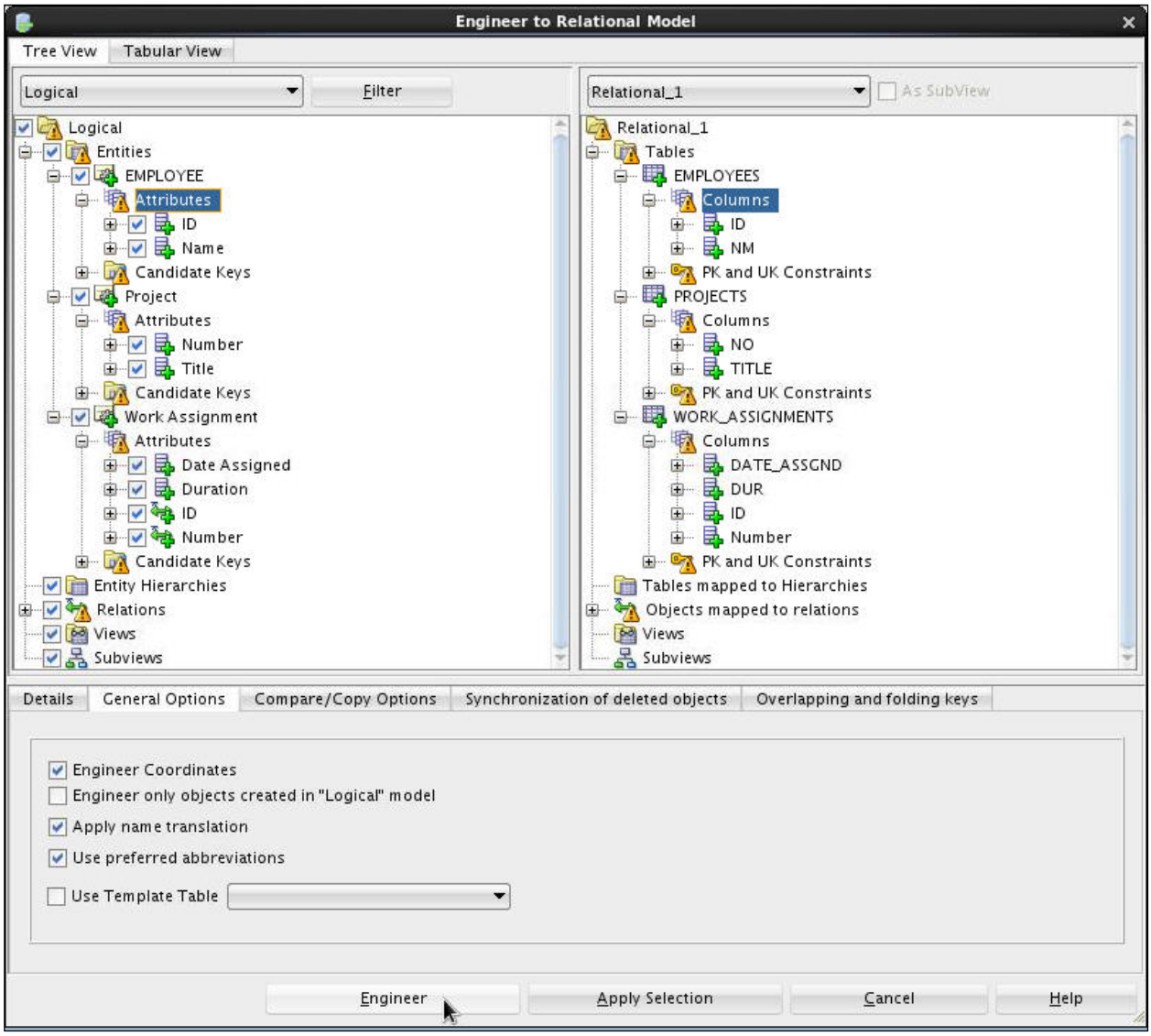
14. Add a **Short Name** and a **Preferred Abbreviation** for each entity. Double-click the `EMPLOYEE` entity, enter `EMP` for the **Short Name** and `EMPLOYEES` for the **Preferred Abbreviation**, and then click **OK**.



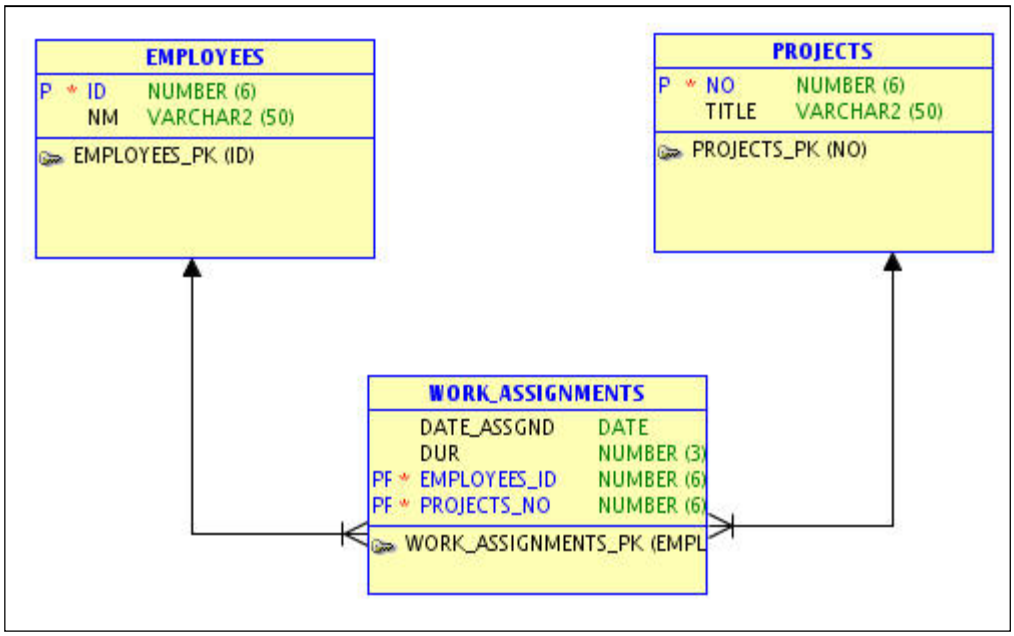
15. Make the following assignments for the other entities:

Entity	Short Name	Preferred Abbreviation
PROJECT	PROJ	PROJECTS
WORK ASSIGNMENT	WRKASSGN	WORK_ASSIGNMENTS

16. Now, you are ready to engineer your model. Click the **Engineer to Relational Model**  icon.
17. Select the **General Options** tab in the lower panel, and then select **Apply name translation**.
18. Expand the entities to see what the mappings are. If satisfied, click **Engineer**; otherwise, click **Cancel**, fix any issues, and then click **Engineer**.

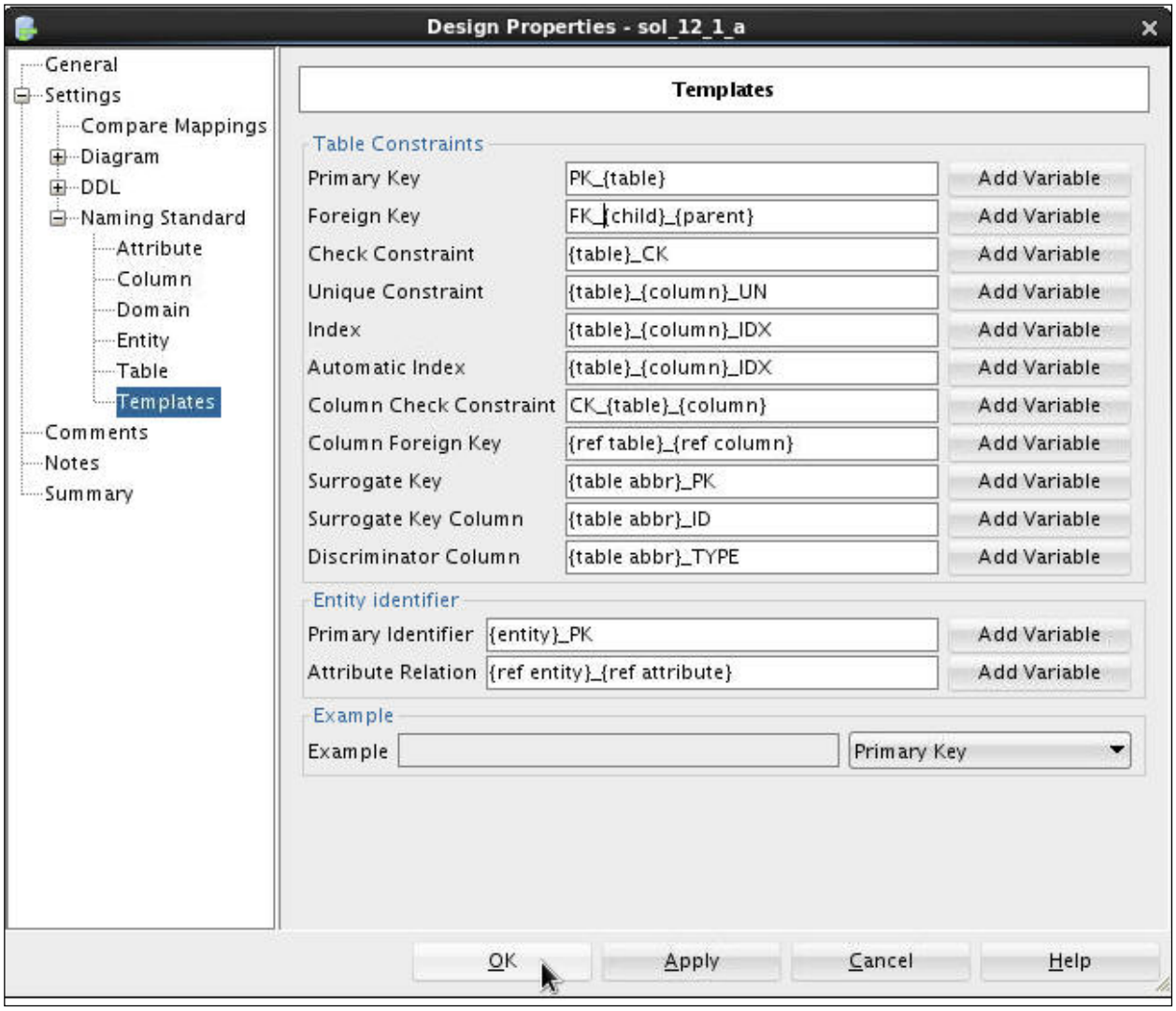


19. The relational model is displayed. You may need to move some of the foreign key relation lines to make it look like the following illustration. Also, your column names may be a little different depending on whether you had the **Keep as the name of the Originating Attribute** option set for the FK Attribute name synchronization general option.

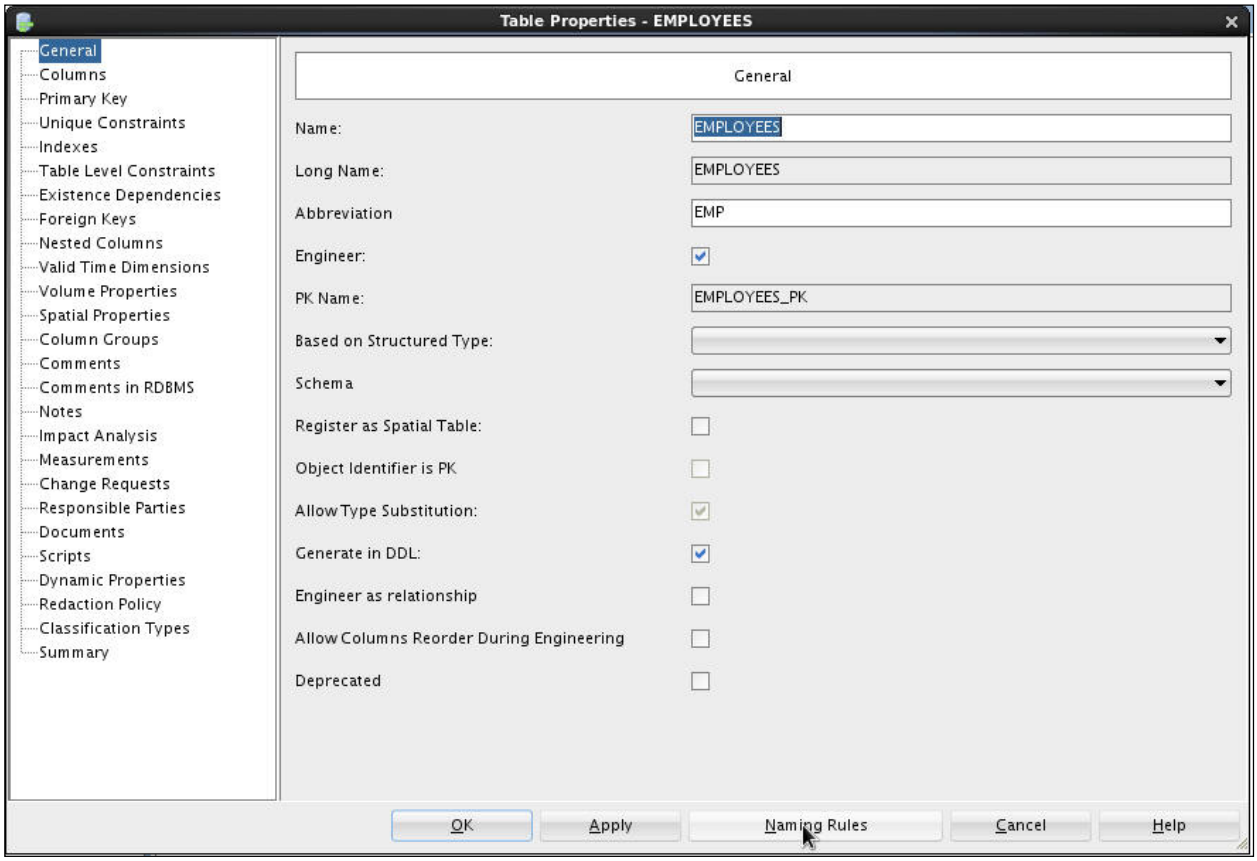


20. At this point, you want to change the names of the primary keys and foreign keys so that `PK` and `FK` are prefixes rather than suffixes. Right-click Design and select **Properties**.
21. In the Design Properties window, expand **Settings**, expand the **Naming Standards** node, and then select **Templates**.

22. Change the primary key and foreign key table constraints so that `PK` and `FK` are prefixes instead of suffixes as shown in the following screenshot. You can type the desired expressions in the **Primary Key** and **Foreign Key** text fields directly. When done, click **OK**.

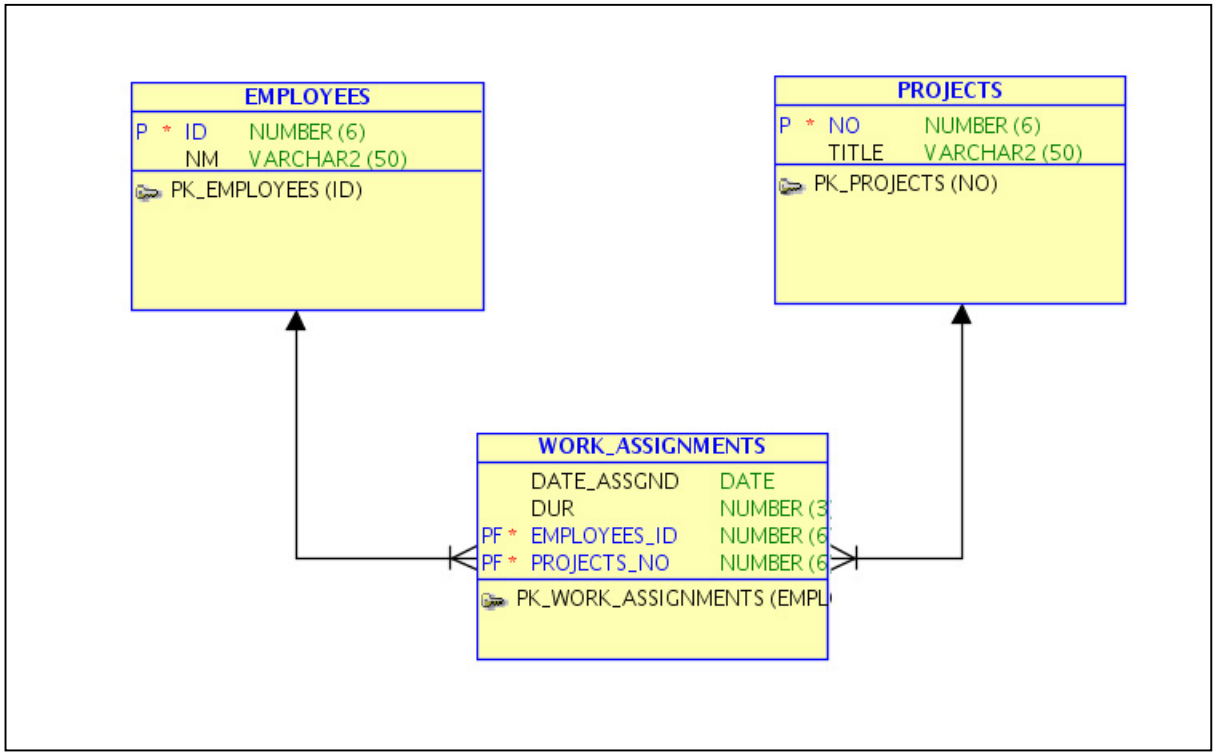


23. To apply the naming, change to the `EMPLOYEES` table, double-click the table to display the **Table Properties** dialog box. Click the **Naming Rules** button. The **Apply Naming Rules** dialog box is displayed.



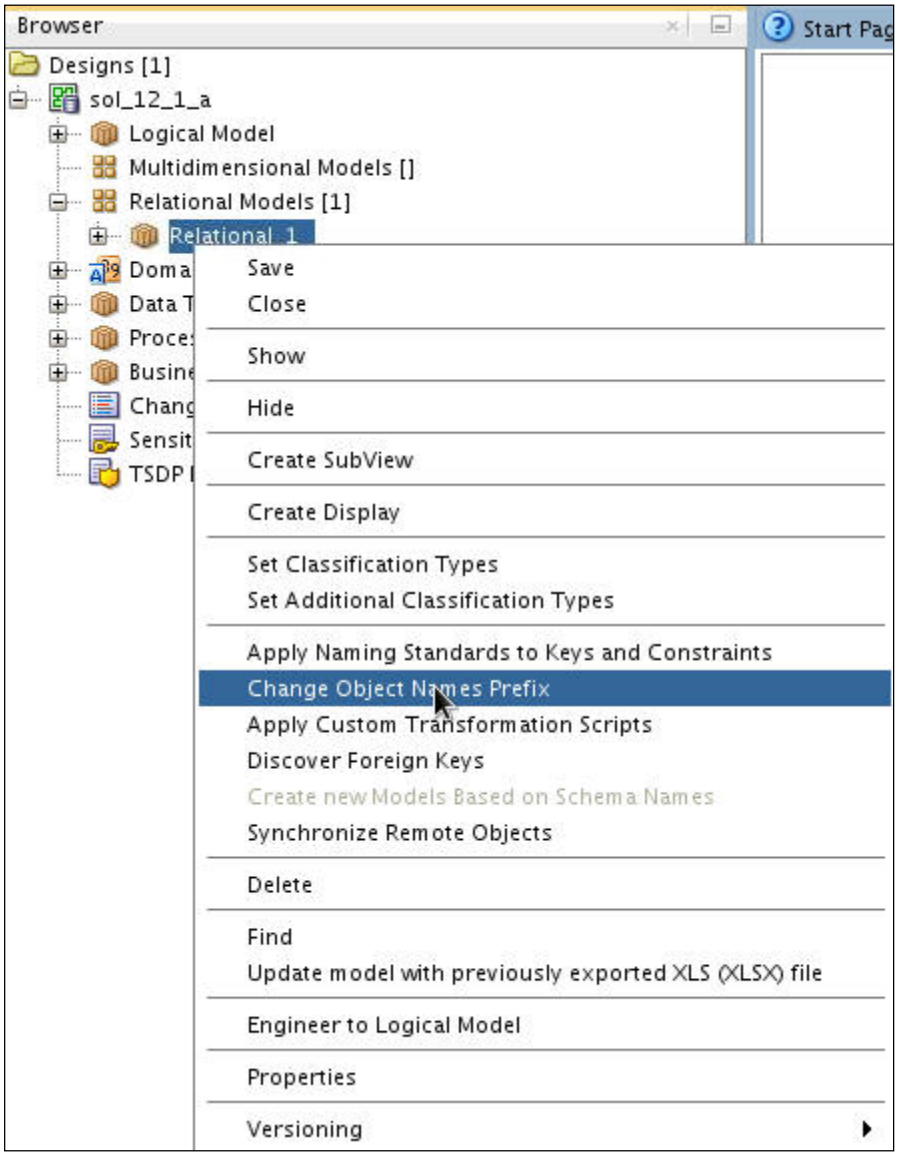
24. Click **OK** to apply the naming rules.

25. Click **OK**. Note that the name of the primary key for `EMPLOYEES` was `EMP_PK` (which includes the short name and the suffix `_PK`), and that it changed to `PK_EMPLOYEES` (which includes `PK_` for the prefix and the table name `EMPLOYEES`) after the template was applied.
26. Perform the previous steps for each entity so that the result looks as follows.



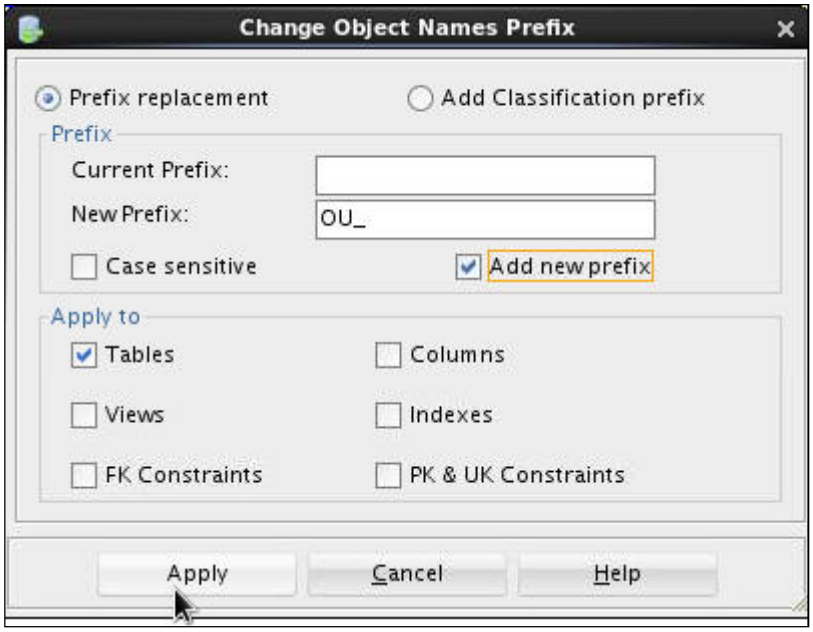
27. Finally, you want to add the `OU_` prefix to each table. Expand the **Relational Models** node in the **Object Browser**.

28. Right-click `Relational_1`, and then select **Change Object Names Prefix** from the pop-up menu. The **Change Object Names Prefix** dialog box is displayed.



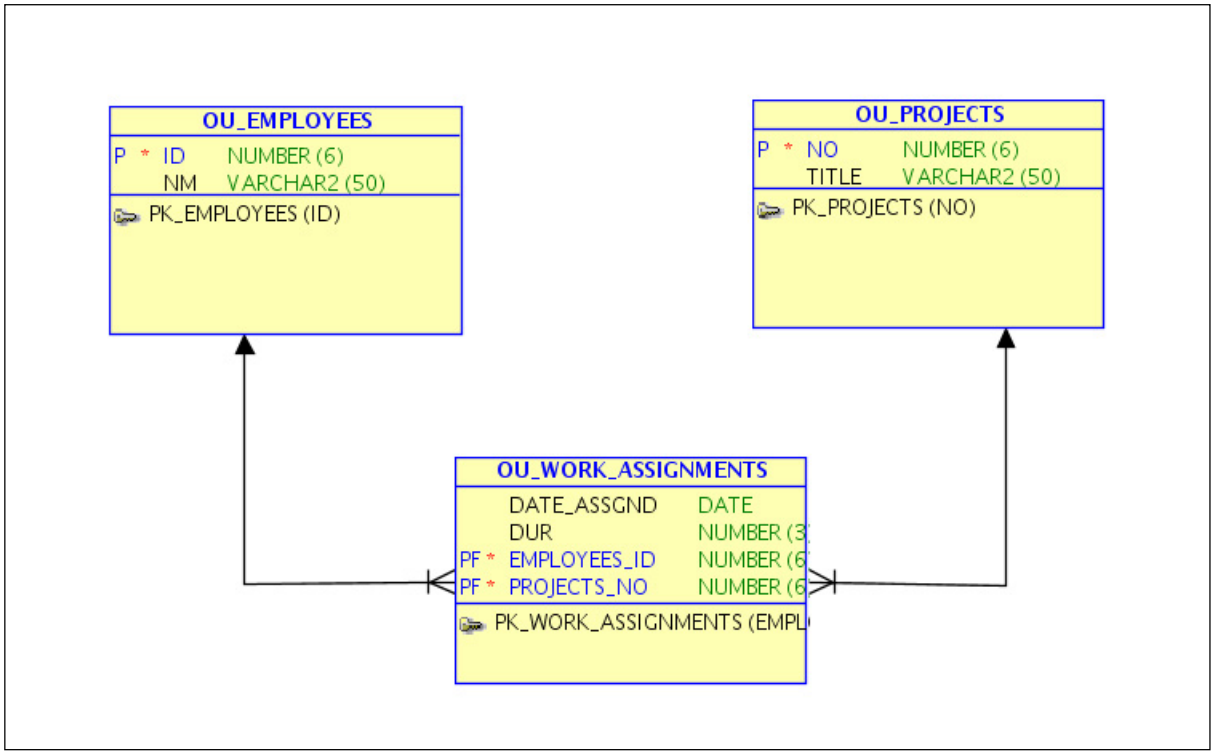
29. Enter `OU_` in the **New Prefix** text box and select the **Add new prefix** check box.

30. Make sure that the **Tables** check box is selected in the **Apply to** region, and then click **Apply**. A **Message** dialog box is displayed.



31. Click **OK** to confirm that three changes were made.

32. Your relational model should look like the following:

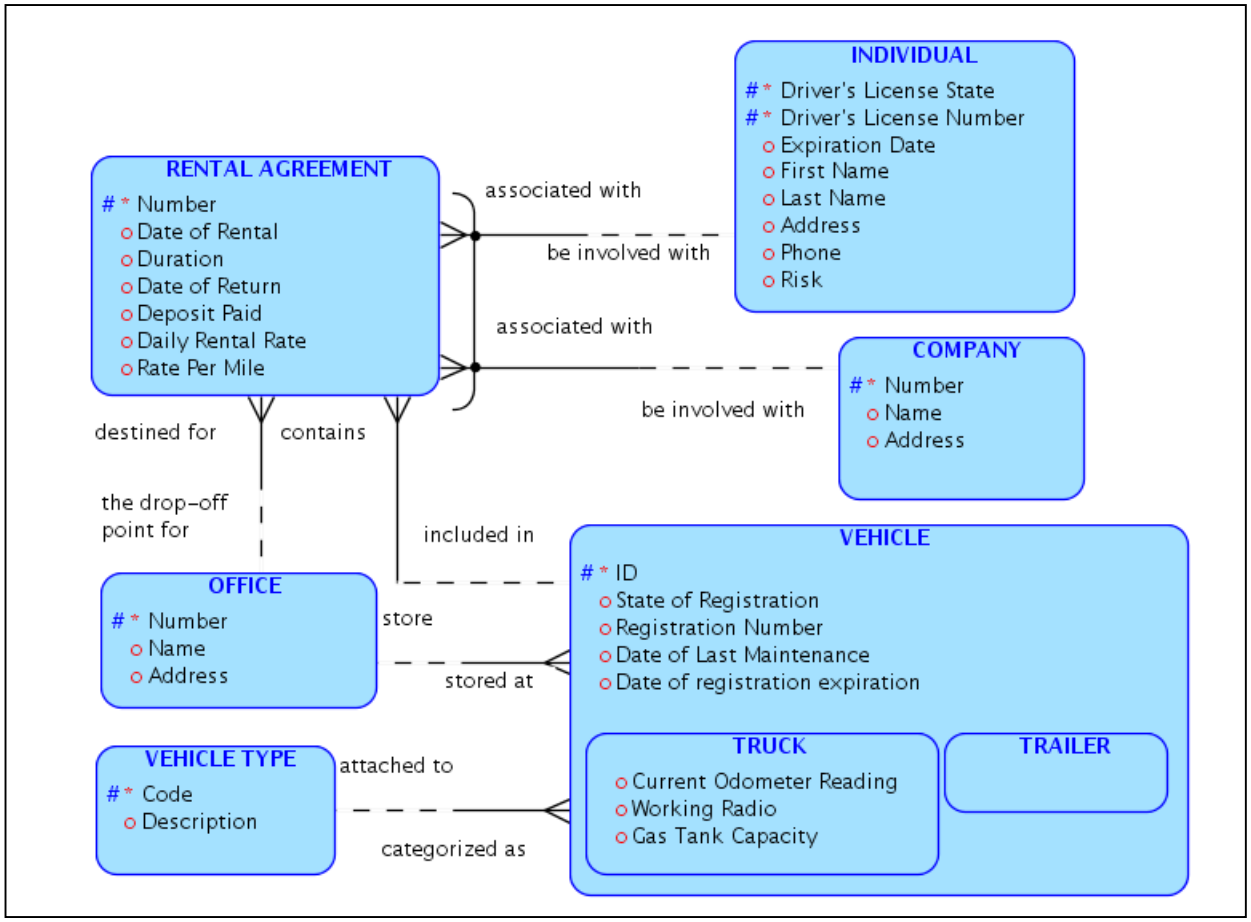


Practice 15-2: Forward-Engineer a Model

For the following ERD that you created in Practice 13-1, perform the following tasks:

1. Review the data types assigned to each attribute. Note that this is the same model that you created domains and a data type model for.
2. Run Design Rules to make sure that you do not have any errors. (Warnings are OK.)
3. Make sure that the FWD engineering strategy is set to Single Table for the entity type hierarchy.
4. Engineer the model to a relational model.
5. Review the results.
6. Create another relational model.
7. Change the engineering strategy for the entity type hierarchy to Table for each entity. Engineer the model again. What differences do you see?

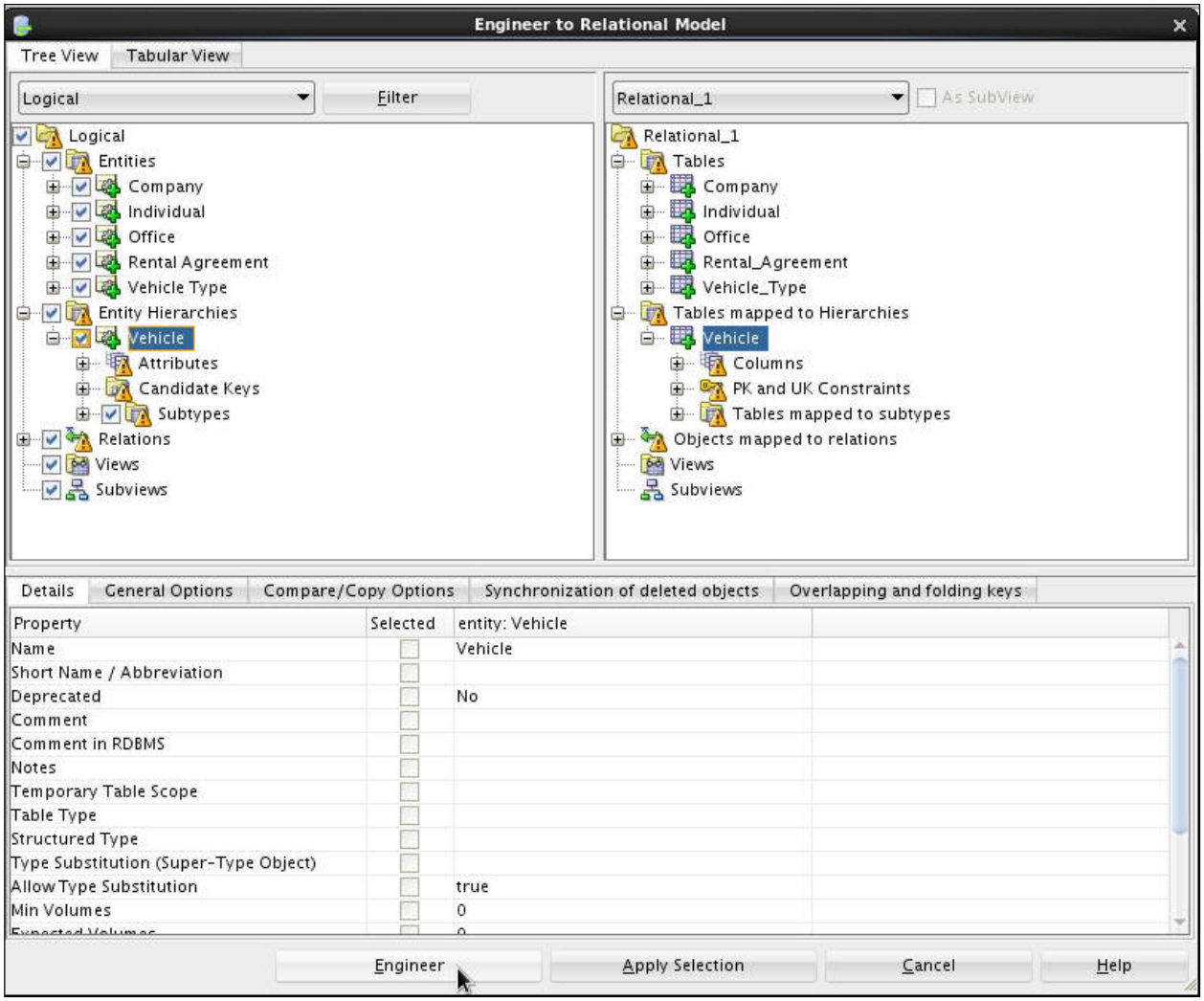
Hint: Open `sol_13_01.dmd` as your starting point, or open the model that you created and completed in Practice 13-1. If your logical model is not displayed, right-click anywhere on the desktop in the **Logical** tab, and then select **Show** from the pop-up menu.



Solution 15-2: Forward Engineer a Model

One possible solution to this practice is:

1. Open the solution for Practice 13-1 (`sol_13_01.dmd`).
2. Click the **Engineer to Relational Model**  icon.
3. Expand the nodes to make sure that the engineering process produces the correct results, and then click **Engineer**.



4. A relational model similar to the following is displayed. You might need to re-size and move the entities around to match the following relational model.