STARDOG ACADEMY

Stardog Designer Training Exercise Guide

This guide will provide information to help users complete class exercises and connect to the training environment for the Stardog Designer Training.

The knowledge kit that is used for this training is based on a Customer 360 use case. In this kit, users can model, query, and explore information about a customer's purchase history and behavior, customer loyalty accounts, product categories and the most used payment methods to name a few. The exercises are designed to help users learn how to build a data model using .CSV files containing synthetic data.

Please note: *The Cloud applications are constantly changing and though we try to keep this guide up to date, sometimes the screenshots and steps will vary. In this case, email training@stardog.com for assistance.*

Training Environment

Stardog Cloud: http://cloud.stardog.com

Training Knowledge Kit: KG Training: C360

Link to Kit: https://cloud.stardog.com/kits/stardog:training-c360:1.0

Data Modeling with Stardog Designer

This example shows how a user can build a data model from scratch using Stardog Designer. In this section, users will create a Designer project and then start building out a data model. There are multiple ways to do this, but in this section, a user will start by building the model in Designer.

Exercise 1 - Create a New Designer Project

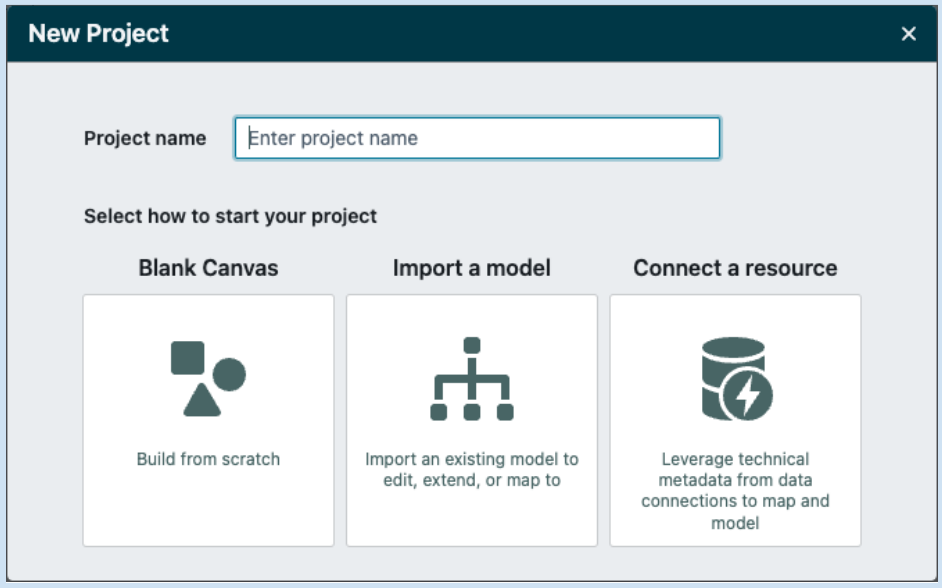
Step 1 - Open Designer

- From https://cloud.stardog.com/, click on `Stardog Designer`.

Step 2 - Create a new project

- From the Designer home screen, click on the `New` button in the upper right corner.

Please note: If you have not used Designer before, you may click on the `New Project` button in the center of your screen or the `New` button in the upper right corner.

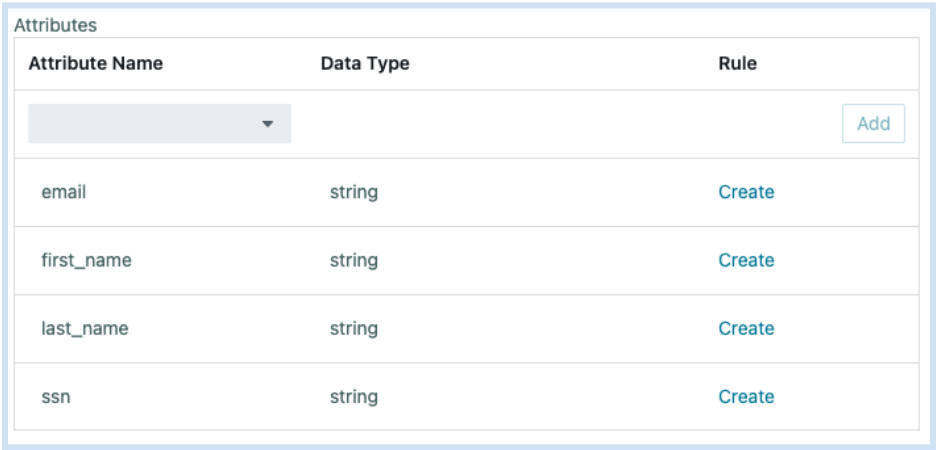


- Name your project. For example: **KG Training [Your Initials]**
- Select the option for `**Blank Canvas**`

Exercise 2 - Create Classes & Attributes

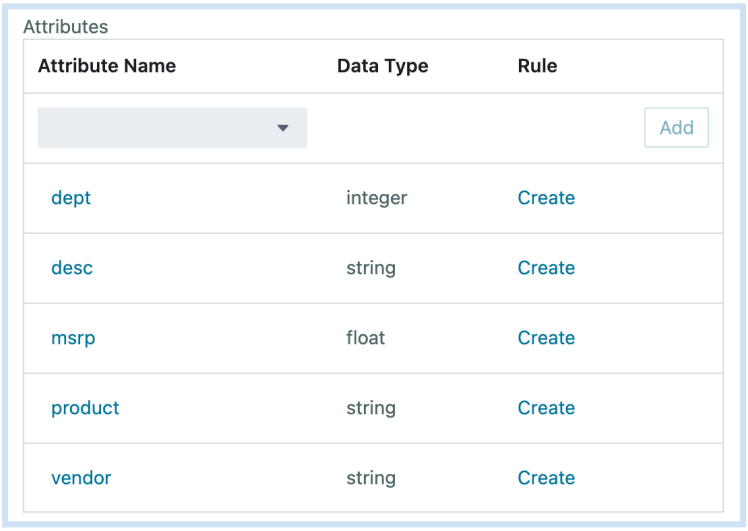
Step 1 - Create Customer Class

- Click on the  icon to create a new class.
- Name the class: **Customer**
- Create these attributes:



Step 2 - Create Product Class

- Click on the  icon to create a new class.
- Name the class: **Product**
- Create these attributes:



Mapping Data Sources

It is now time to map data sources in Designer. Users will learn how to map a CSV file in two ways: first, by mapping the file to an existing class; and second, by starting with mapping the data source to build the data model. The files can be downloaded by clicking on the links in this document or by downloading them from GitHub.

Download these files locally:

- US_customer.csv
- products.csv
- Category.csv
- Purchases.csv

Github:

- https://github.com/stardog-union/training/tree/main/designer

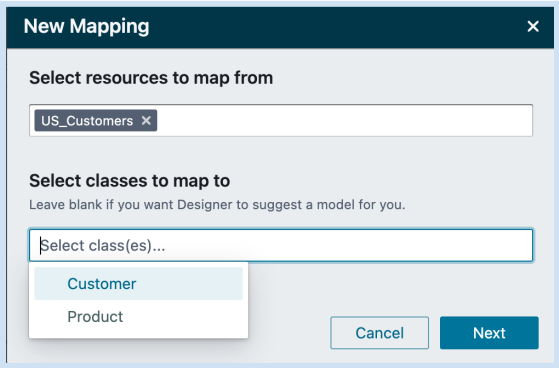
Exercise 3 - Upload Your Data

In this exercise, you will map a CSV file to a class in Designer.

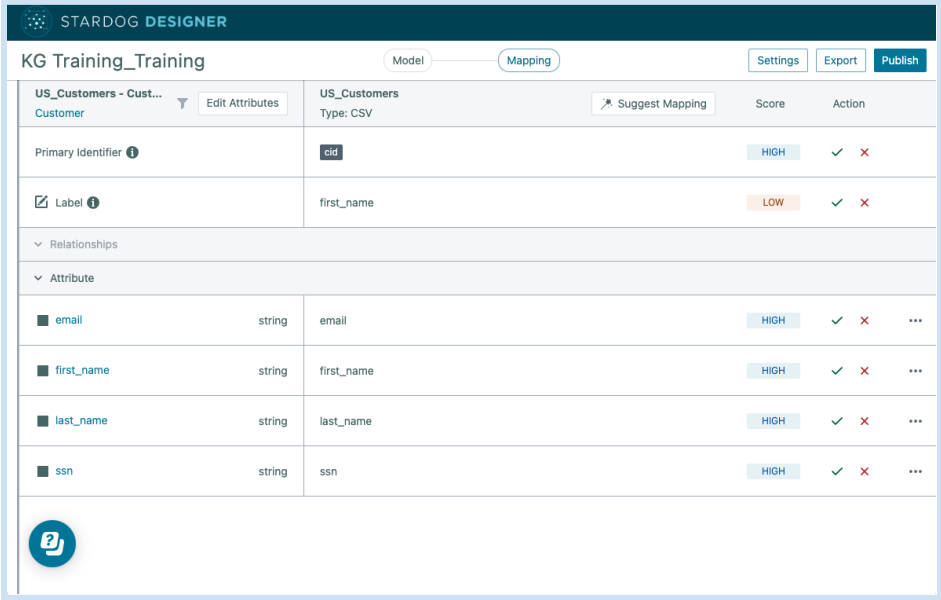
Step 1 - Upload, map, and model US_Customers.csv

- Click on the plus icon next to `Project Resources` in the upper left corner.

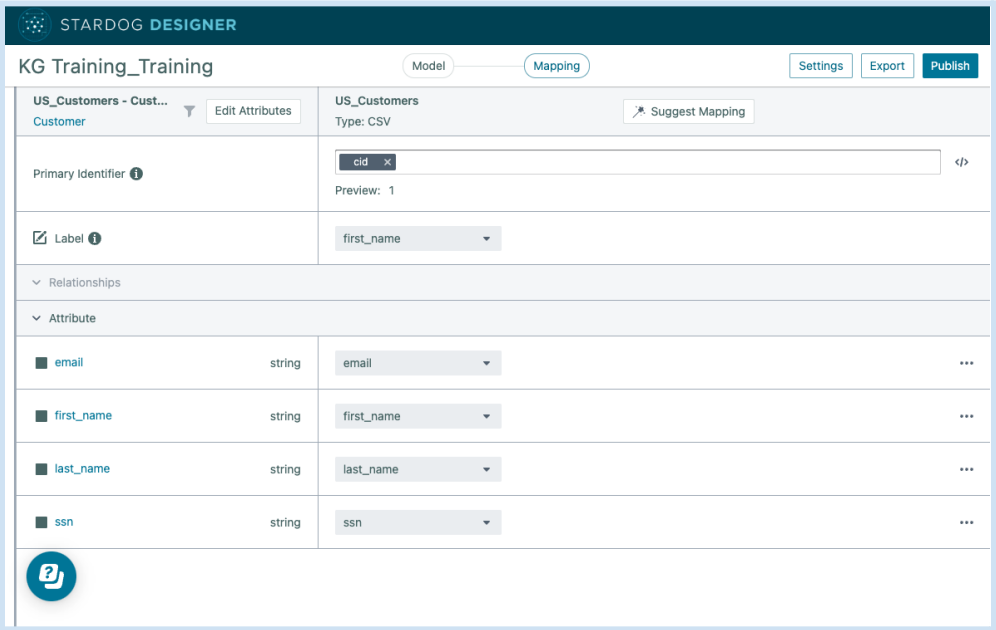
- Drag and drop or browse to upload the US_customers.csv file.
- After reviewing the preview, click on `Create & Map`.
- Select the **Customer** class and then click on `Next`.



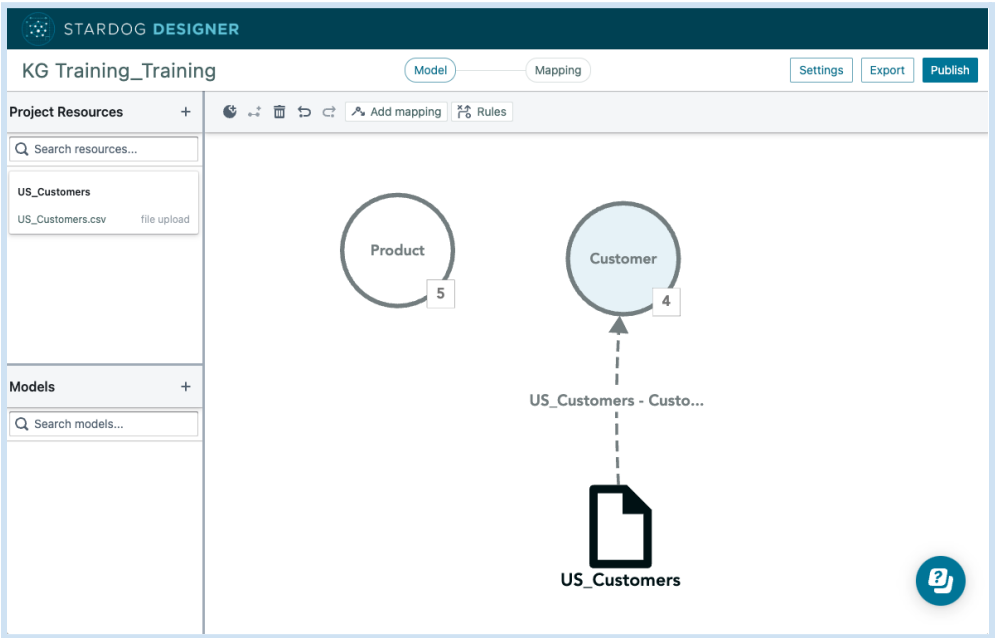
- Click on the X next to the Label suggestion. Then select **full_name** from the drop-down box.



- Accept the rest of the suggested mappings by clicking on the green ✓ and then click on **Model** to view the new resource mapping.



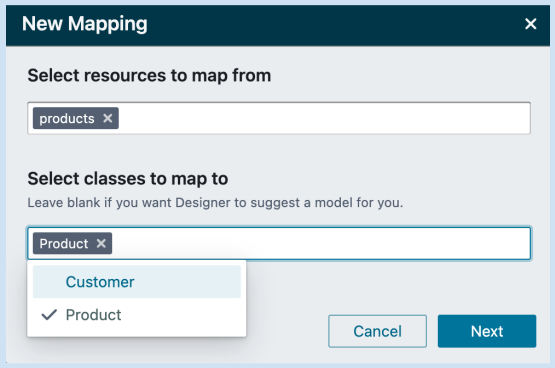
- Click on Model to view the mapping in the canvas.



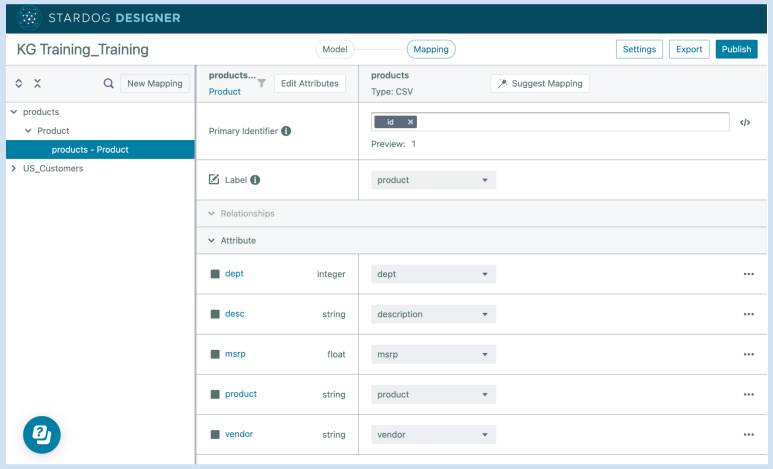
Step 2 - Upload, Map, and Model products.csv

- Click on the plus icon next to `Project Resources` in the upper left corner.
- Drag and drop or browse to upload the products.csv file.
- After reviewing the preview, click on `Create & Map`.

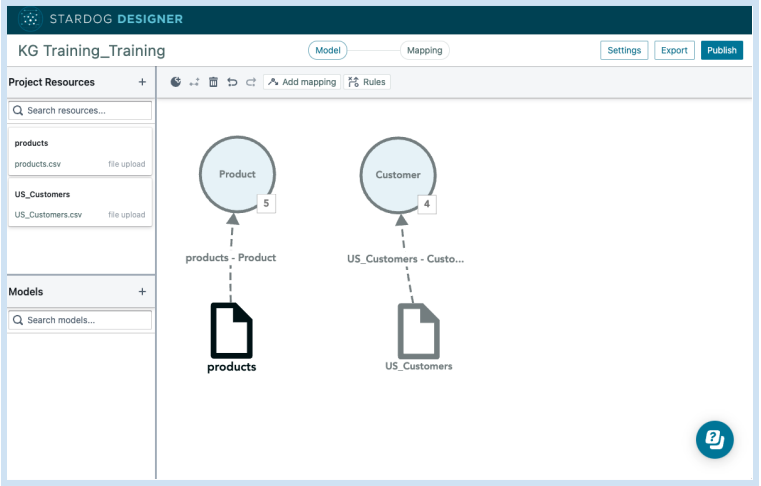
- Select the **Product** class and then click on `Next`.



- Accept all the suggested mappings by clicking on the green ✓ and then click on **Model** to view the new resource mapping.



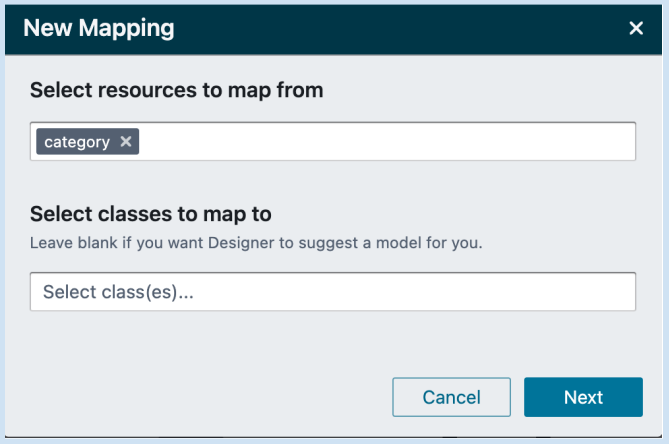
- Click on Model to view the mapping in the canvas.



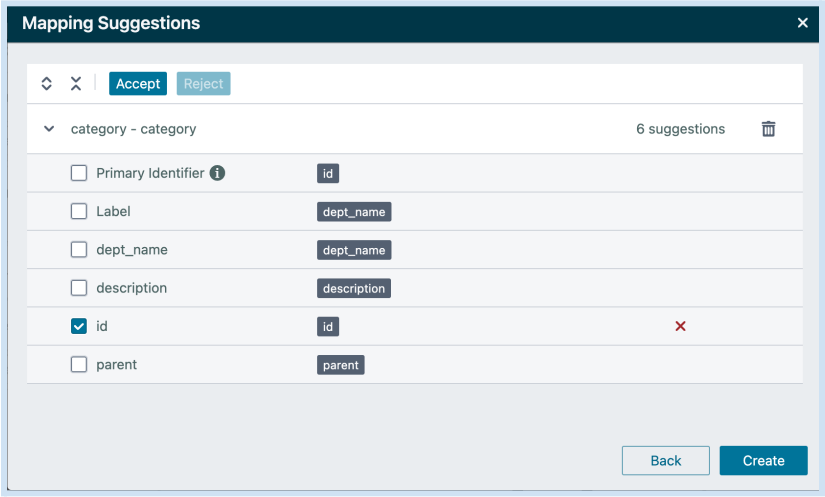
In steps 3 & 4, you will upload a CSV file first and then use the Create & Map feature to create 2 new classes. The class details can be modified if they need to be changed at a later time.

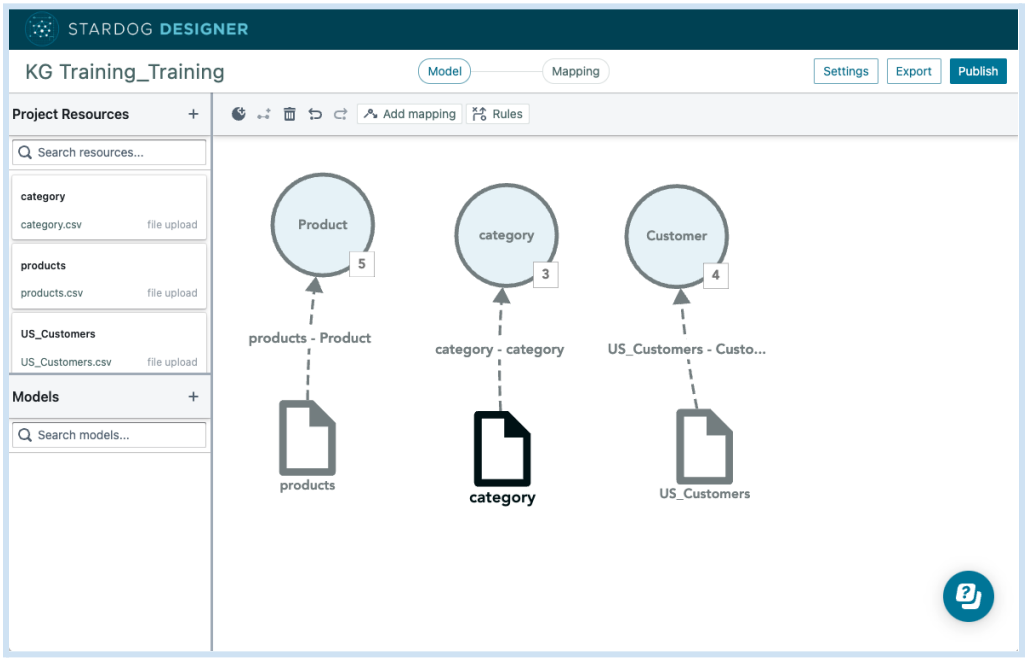
Step 3 - Upload, Map, and Model category.csv

- Click on the plus icon next to `Project Resources` in the upper left corner.
- Drag and drop or browse to upload the category.csv file.
- After reviewing the preview, click on `Create & Map`.
- Without changing the dialog, click on `Next`.



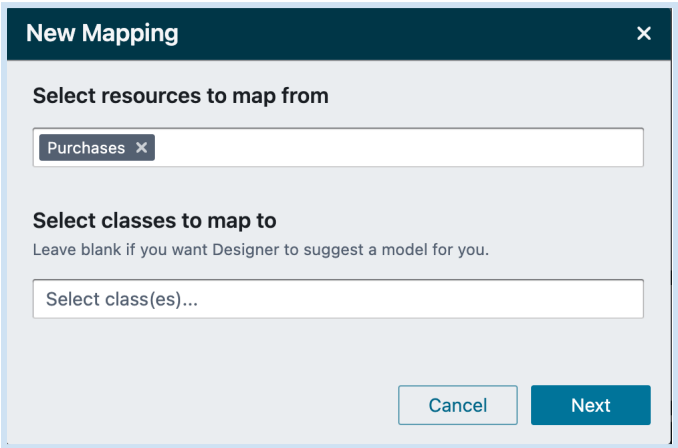
- Drop down the options under `category - category` and check off the row for `id`
- Click `Reject`.
- Click on `Create`.

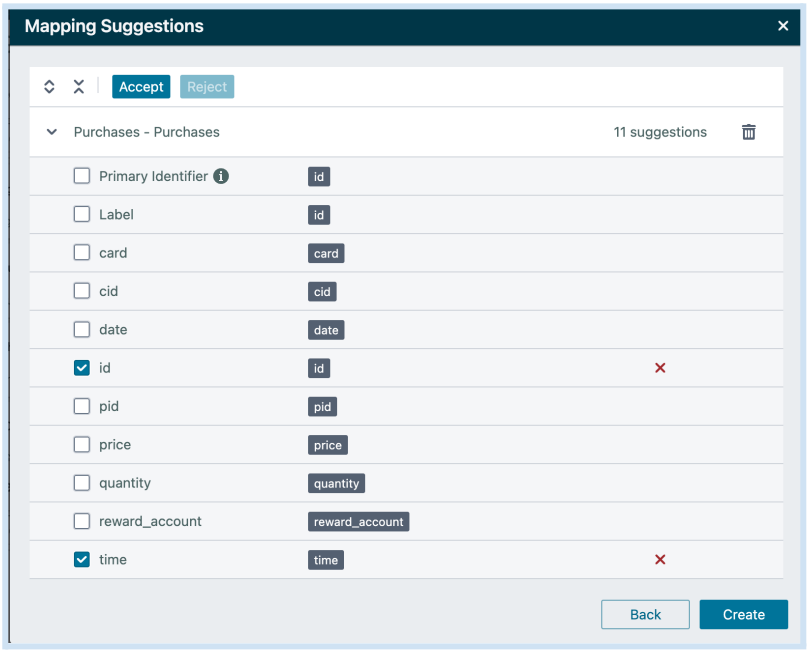




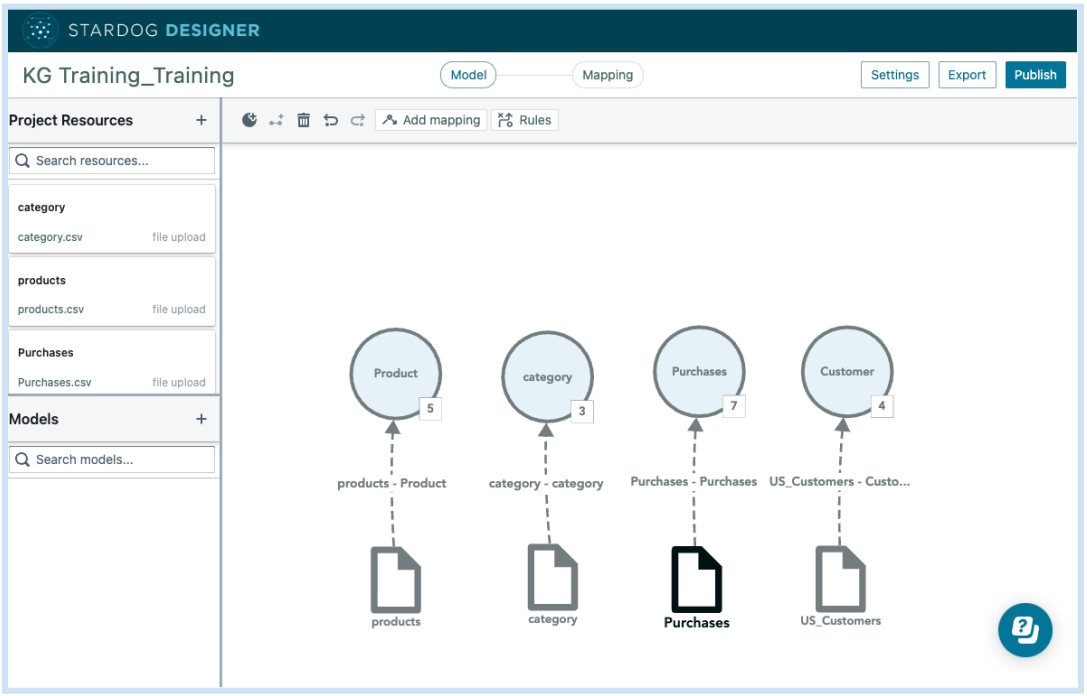
Step 4 - Upload, Map, and Model Purchases.csv

- Click on the plus icon next to `Project Resources` in the upper left corner.
- Drag and drop or browse to upload the Purchases.csv file.
- After reviewing the preview, click on `Create & Map`.
- Without changing the dialog, click on `Next`.
- Drop down the options under `Purchases - Purchases` and check off the rows for `id` and `time`.
- Click `Reject`.





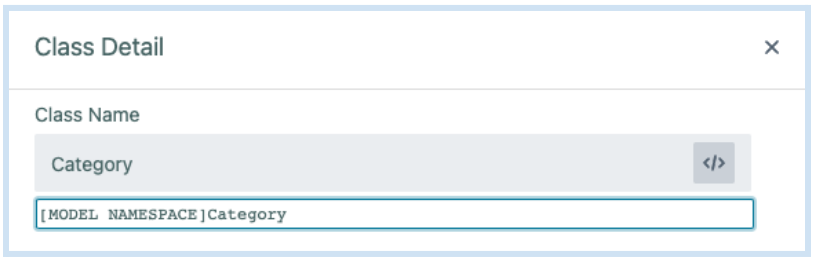
- Click on `Create`.



Exercise 4 - Edit Classes

Class details can be edited from the UI. In this section, all classes will be renamed so that they start with a capital letter and are singular. This is a recommended naming convention best practice.

Step 1 - Edit category class

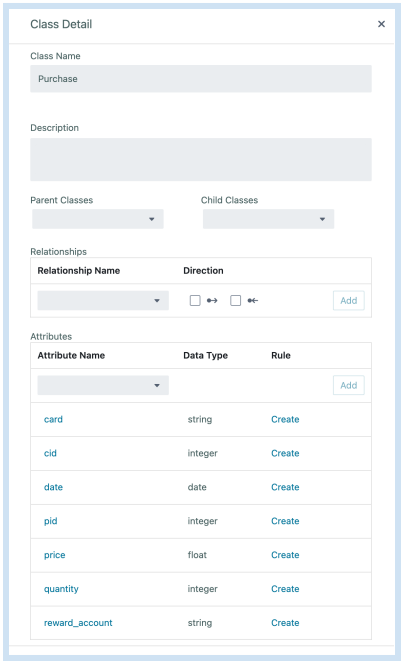


- Double-click on the `category` class.
- Click on the Class Name text field and edit to `Category`.
- Click on the Code Block icon next to `Category` to show IRI. Edit IRI to be `[MODEL NAMESPACE]Category`.
- Close the Class Detail window with the X button in the upper right-hand corner.

Step 2 - Edit Customer class

- Double-click on the `Customer` class.
- Add a **Description**, such as `Someone who made a purchase`.
- Close the Class Detail window with the X button in the upper right-hand corner.

Step 3 - Edit Purchases class



- Double-click on the `Purchases` class.
- Click on the Class Name text field and edit to `Purchase`.
- Click on the Code Block icon next to `Purchase` to show IRI. Edit IRI to be `[MODEL NAMESPACE]Purchase`.

- Click on the pencil icon next to `date`. Change the datatype to `date`. Click `Update`.
- Click on the pencil icon next to `price`. Change the datatype to `float`. Click `Update`.
- Close the Class Detail window with the X button in the upper right-hand corner.

Create & Map Relationships

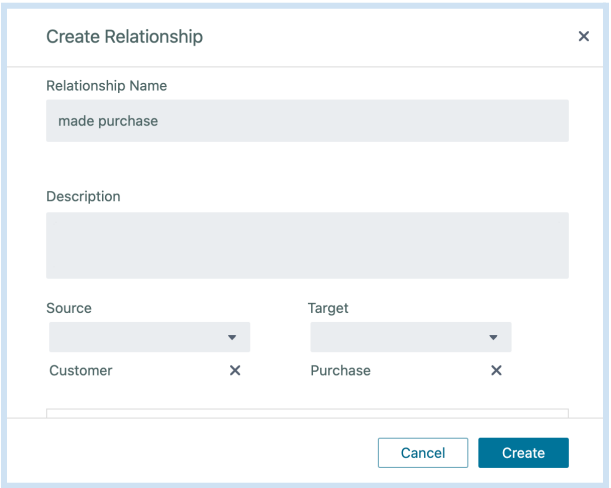
These exercises will walk you through creating, mapping, and editing relationships. Relationships describe how two classes are connected. For example, a Customer made purchase describes the relationship between Customer and Purchase.

Exercise 5 - Create and Map Relationships

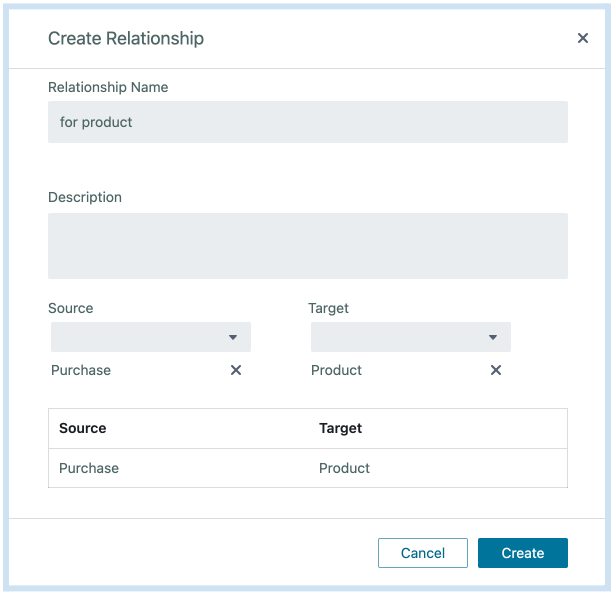
Step 1 - Create Relationships

- To create a relationship, click on the class that you want as the source. Then click on the  icon on the toolbar. Create the relationships below.

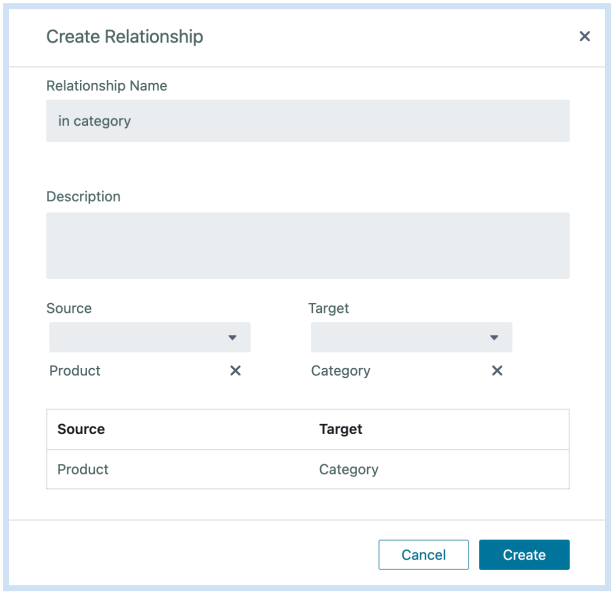
1. Relationship: **made purchase**



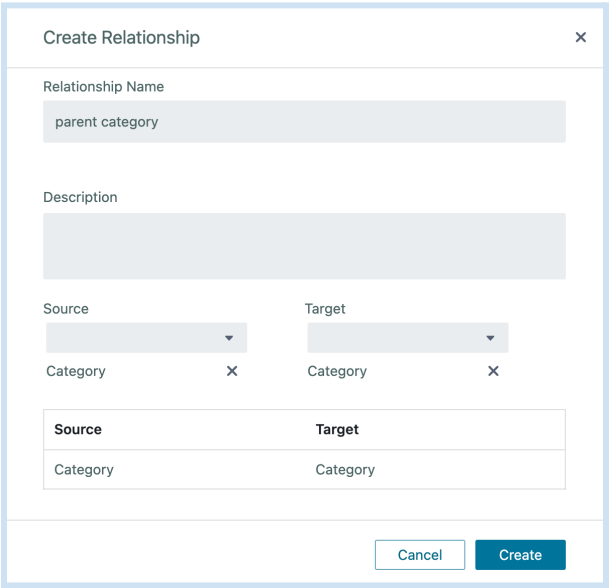
2. Relationship: **for product**



3. Relationship: **in category**



4. Relationship: **parent category**

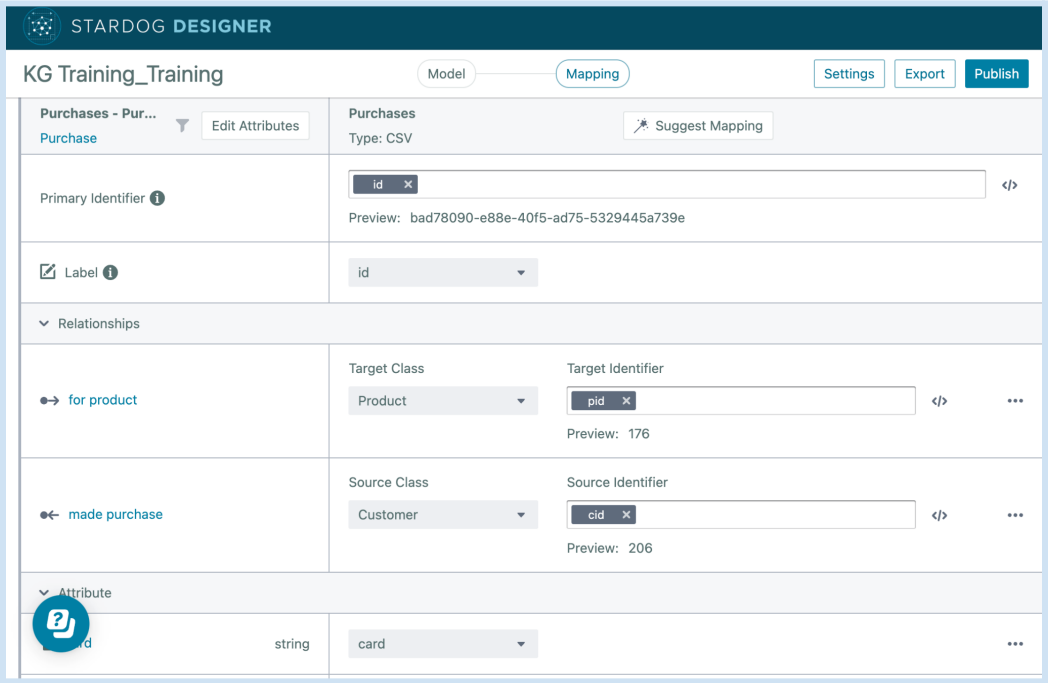


In Step 2, users will now edit the mappings by making sure each primary key has been identified and the relationship target and source have identifiers. Users can also update Labels too.

> Label annotations are used throughout Stardog as the display name for an instance. When no label is set, the primary identifier value will be displayed instead.

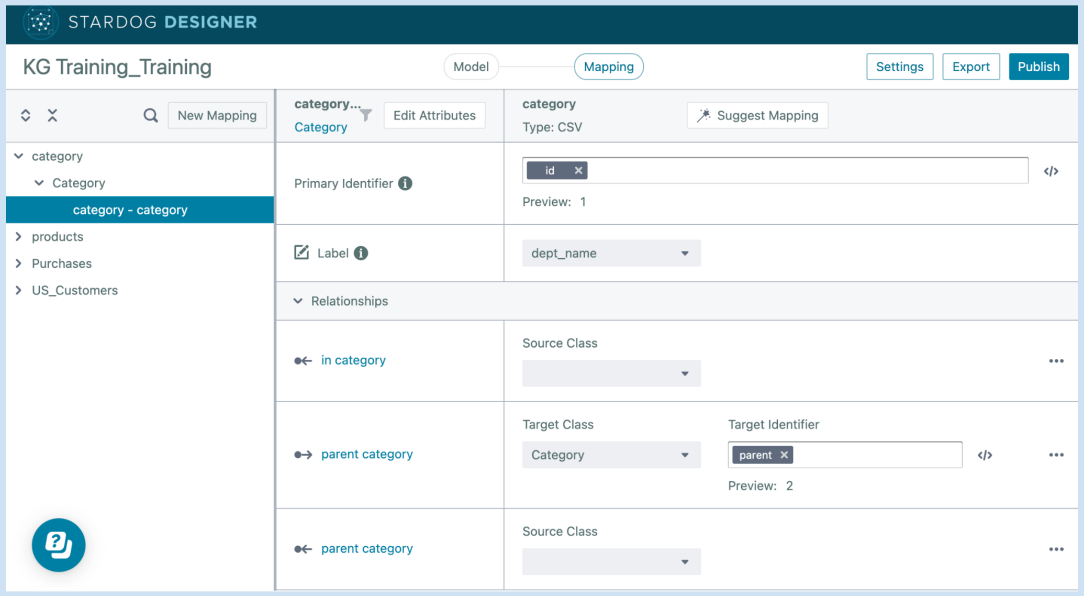
Step 2 - Modify and Add Relationship Mappings Purchases Mapping

- Double-click on the Purchases file in the canvas.
- Click on the mapping for `Purchases - Purchases`.
- Verify that the **Label** mapping is `id`.
- Set the **Target Class** for the relationship `for product` to `Product` and the **Target Identifier** to `pid`.
- Set the **Source Class** for the relationship `made purchase` to `Customer` and the **Source Identifier** to `cid`.
- Click on **Model** to go back to the canvas.



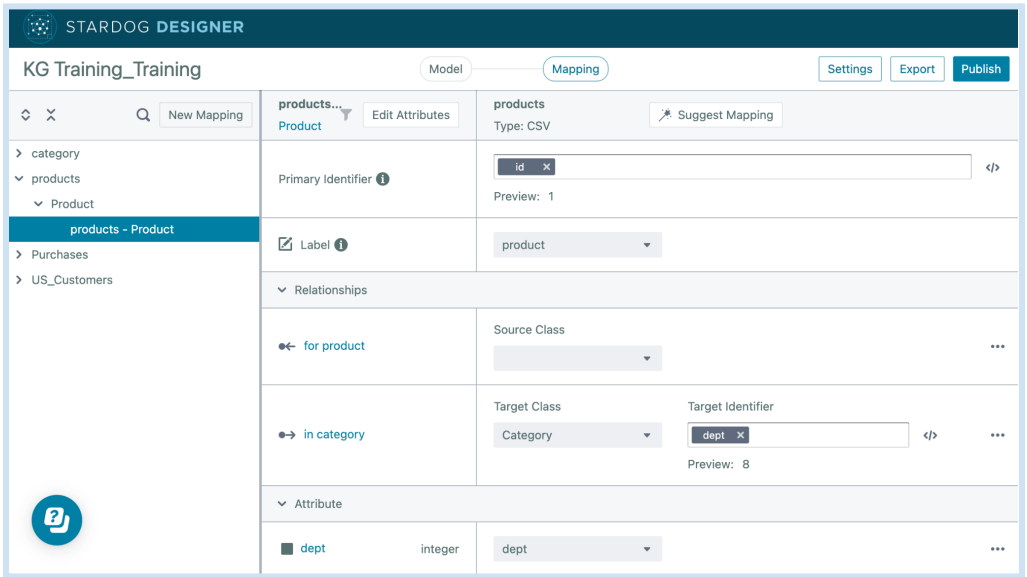
Step 3 - Add relationship mappings category Mapping

- Double-click on the Category file in the canvas.
- Click on the mapping for `category - category`.
- Set the **Target Class** for the relationship `parent category` to `Category` and the **Target Identifier** to `parent`.
- Click on **Model** to go back to the canvas.



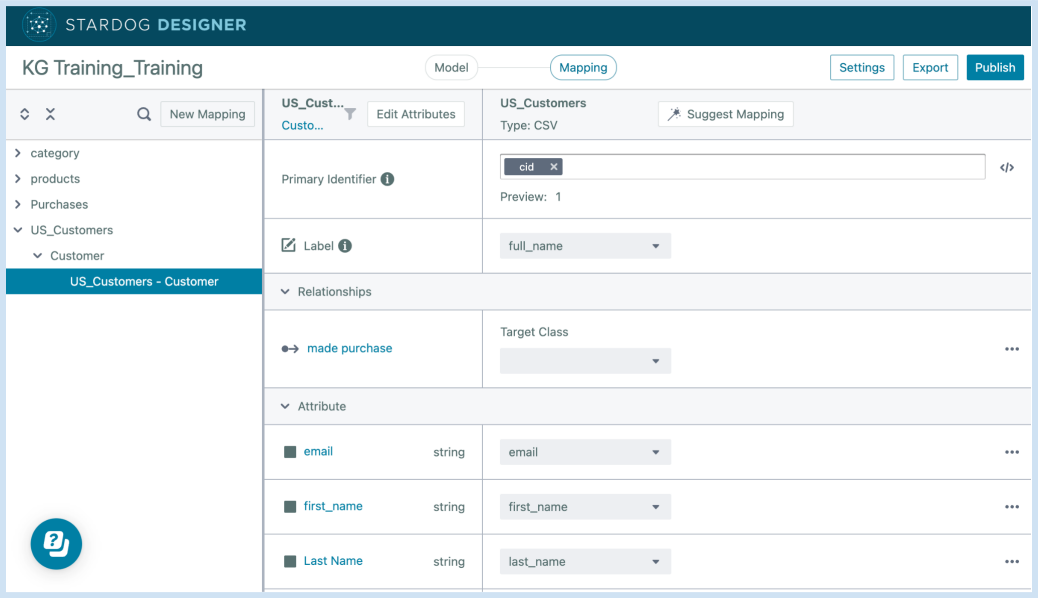
Step 4 - Modify and add relationship mappings products Mapping

- Double-click on the products file in the canvas.
- Click on the mapping for `products - products`.
- Set the **Target Class** for the relationship `in category` to `Category` and the **Target Identifier** to `dept`.
- Click on **Model** to go back to the canvas.



Step 5 - Modify US_Customers Mapping

- Double-click on the US_Customers file in the canvas.
- Click on the mapping for `US_Customers - Customer`.
- Verify that the **Label** mapping is `full_name`.



Publish a Data Model

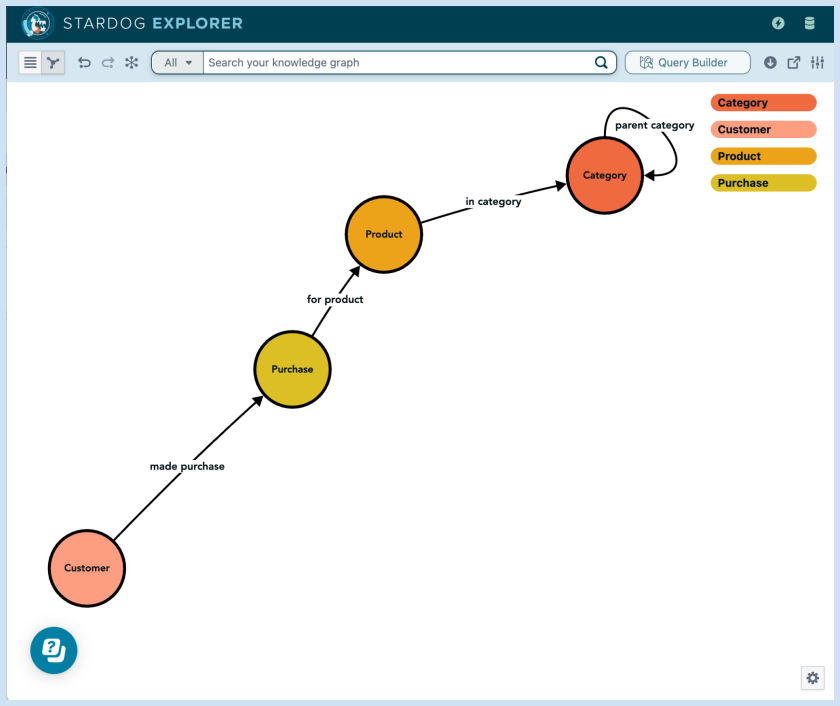
In this step, you will publish your project so that you can view it in Stardog Explorer. This allows you to see the model and view the mapped data. This is a good way to validate your work.

Exercise 6 - Publish your project

To publish you will need to:

- Click on Publish in the top right corner
- Create a new Database - `KG_Training_[Your initials]`
- Accept the default model namespace or modify - Accept
- By default, the “Download zipped project is turned on. Toggle off.
- Click Next
- You can adjust the model configuration. For this exercise just accept the defaults which will create a new model.
- Click Next

- You can adjust the mappings. For this exercise just accept the defaults, which will create new graphs for all resources.
- Click Publish
- Go to cloud.stardog.com, Select Explorer, connect to your database, and then click on Visualize.



Import a Model

In this section you will create a new Designer project and then import the model that was just created. You will also create a new relationship and an inference rule for the relationship. Creating a new project and data model allows us to have multiple data models using the same underlying data. In the final labs, this second model contains new classes and inference rules. When in the Explorer settings, you can view either model and apply reasoning.

You could also use this strategy to provide different “Views” of your data model. For example, the Marketing team has a different way of calling things than the Product team. You could create other models based on the same underlying data so that each department has customized labels and definitions.

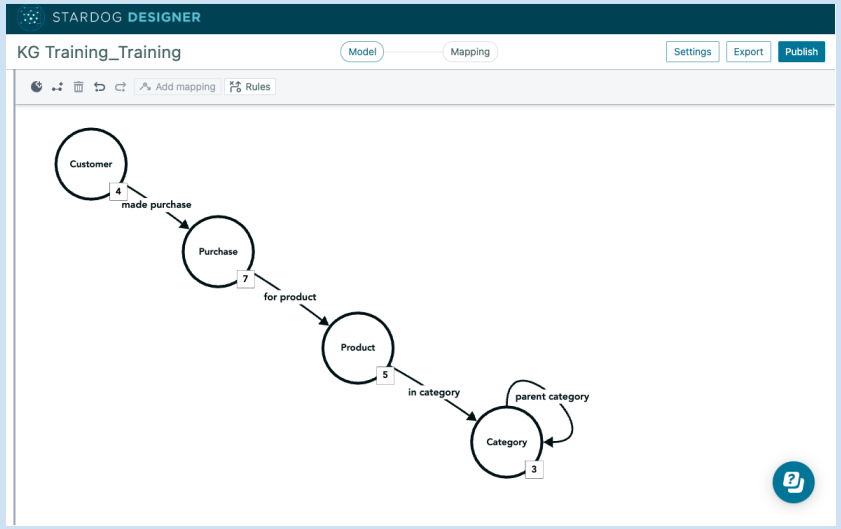
Exercise 7 - Create a new project and import a model

Step 1 - Open Designer

- From https://cloud.stardog.com/, click on `Stardog Designer`.

Step 2 - Create a new project

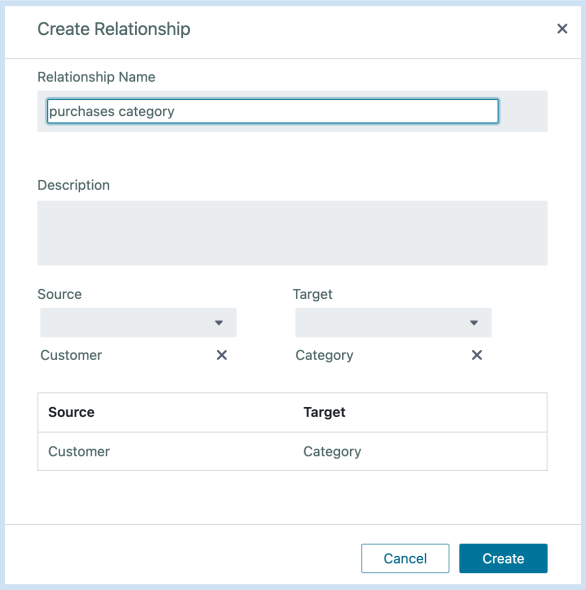
- From the Designer home screen, click on the `New` button in the upper right corner.
- **Project name:** Rules KG Training [Your initials]
- Select the option to `Import a model`
- Select the **database** you created when publishing your project (such as KG_Training_[Your initials]).
- Select the **model** you created when publishing your project (such as KG_Training_[Your initials]).
- Click `Add`.



Step 3 - Create a new relationship

From the Designer home screen, click on the `Add Relationship` button in the upper right corner.

Create a new relationship for `purchases category` with `Customer` as the **Source** and `Category` as the **Target**.



Inference Rules

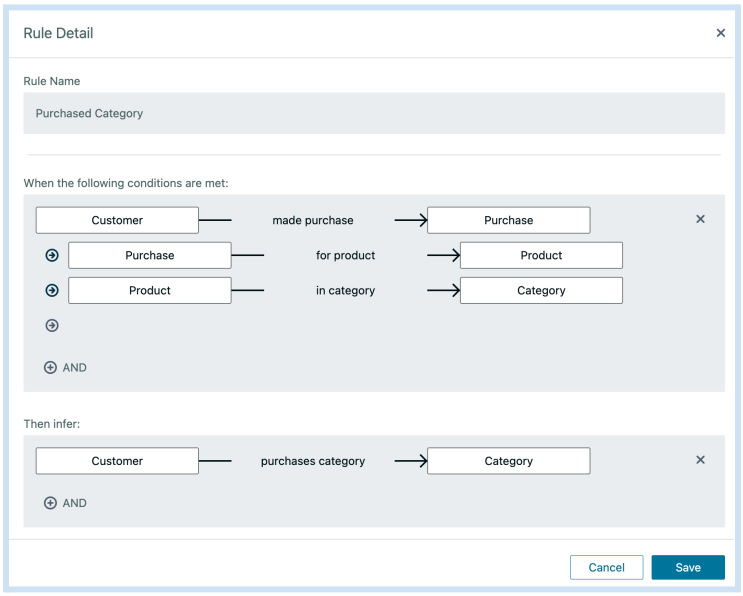
This section will cover the steps to create new classes and inference rules. These will then be published to Explorer. The inference rules allows the ability to infer implicit knowledge from explicit data. Inference rules can be set up using classes or relationships.

Exercise 8 - Create Inference Rules

Step 1 - Create a rule for the new relationship

- Click on the Rules button 

- Name the Rule: **Purchased Category**
- Add in the conditions listed below and then click save

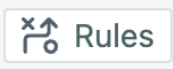


Please Note: *It is a good best practice to publish the model frequently during development to validate changes by viewing it in Explorer.*

Step 2 - Create classes referenced below

- Remember to create a class, click on the  icon in the Designer toolbar.

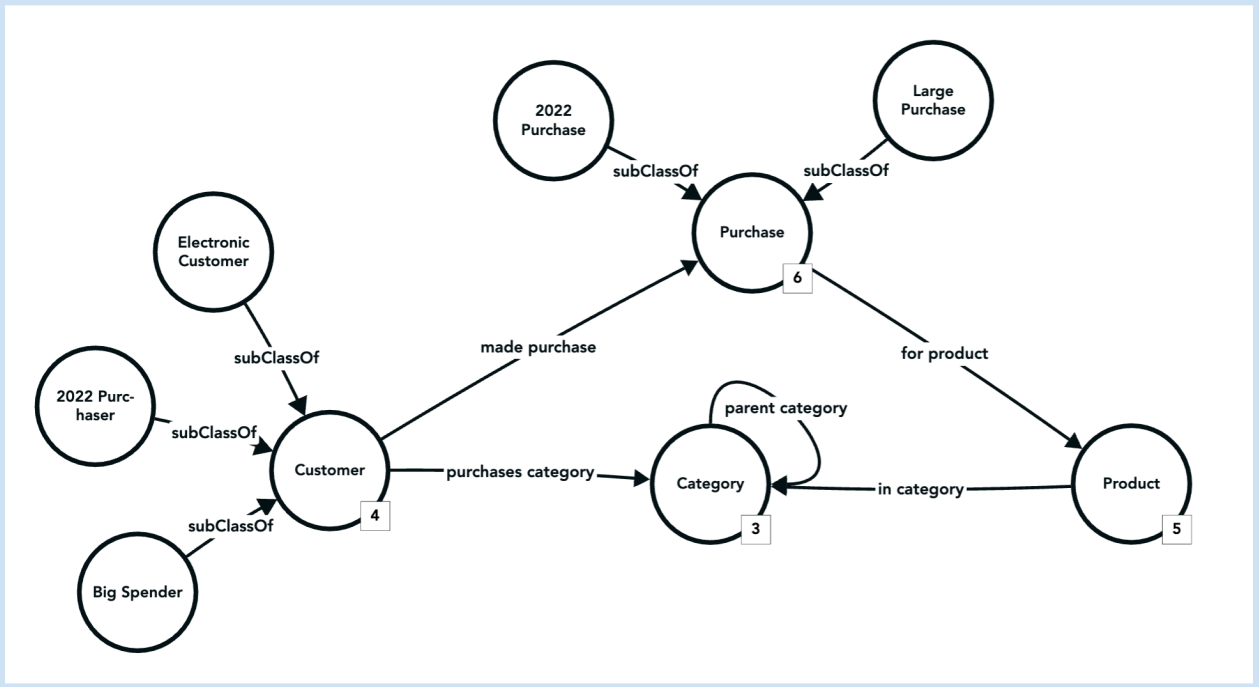
Step 3 - Create rules referenced below

- To create a rule, click on the 

icon in the Designer toolbar.

Create Class	**Create Rule**
Class Name: Electronic Customer **Description:** **Parent Class:** Customer	**Rule Name:** Electronic Users **Conditions:** Customer - purchases category ➜ Category Category - dept_name = Electronics **Then infer:** Customer Classify As Electronic Customer

Class Name: Electronic Customer **Description:** **Parent Class:** Customer	**Rule Name:** Electronic Users through parent class category **Conditions:** Customer - purchases category → Category Category - parent category → Category (2) Category(2) - dept_name = Electronics **Then infer:** Customer Classify As Electronic Customer
Class Name: Large Purchase **Description:** **Parent Class:** Purchase	**Rule Name:** Large Purchases **Conditions:** Purchase - price >= 20000 **Then infer:** Purchase classify As Large Purchase
Class Name: Big Spender **Description:** **Parent Class:** Customer	**Rule Name:** Big Spenders **Conditions:** Customer - made purchase → Large Purchase **Then infer:** Customer Classify As Big Spender
Class Name: 2022 Purchase **Description:** **Parent Class:** Purchase	**Rule Name:** Purchases in 2022 **Conditions:** Purchase - date between Jan 01, 2022 to Dec 31, 2022 **Then infer:** Purchases Classify As 2022 Purchase
Class Name: 2022 Purchaser **Description:** **Parent Class:** Customer	**Rule Name:** Customers who made purchases in 2022 **Conditions:** Customer - made purchase → 2022 Purchase **Then infer:** Customer Classify As 2022 Purchaser



Exercise 9 - Publish your project

In this step, you will publish your project so that you can view it in Stardog Explorer. This allows you to see the model and view the data that was mapped. This is a good way to validate your work.

To publish you will need to:

- Select the Database you originally published to - `KG_Training_[Your initials]`
- Accept the default model namespace or modify - Accept
- By default, the “Download zipped project is turned on. Turn it off.
- Click Next
- You can adjust the model configuration. For this exercise just accept the defaults, which will create a new model. Make sure that the `Publish Inference Rules` is turned on.
- Click Publish
- Go to cloud.stardog.com, Select Explorer, connect to your new project, and then click on Visualize.

Exercise 10 - View in Explorer

Now it is time to validate your inference rules by viewing your new published data model in Explorer. After publishing the new model, open your database in Explorer. Open Settings and then select the new model and then turn on Reasoning. The canvas should now display the data model with the new classes that were created to hold the inferred information.