

# 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](mailto:training@stardog.com) for assistance.*

## Training Environment

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**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

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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

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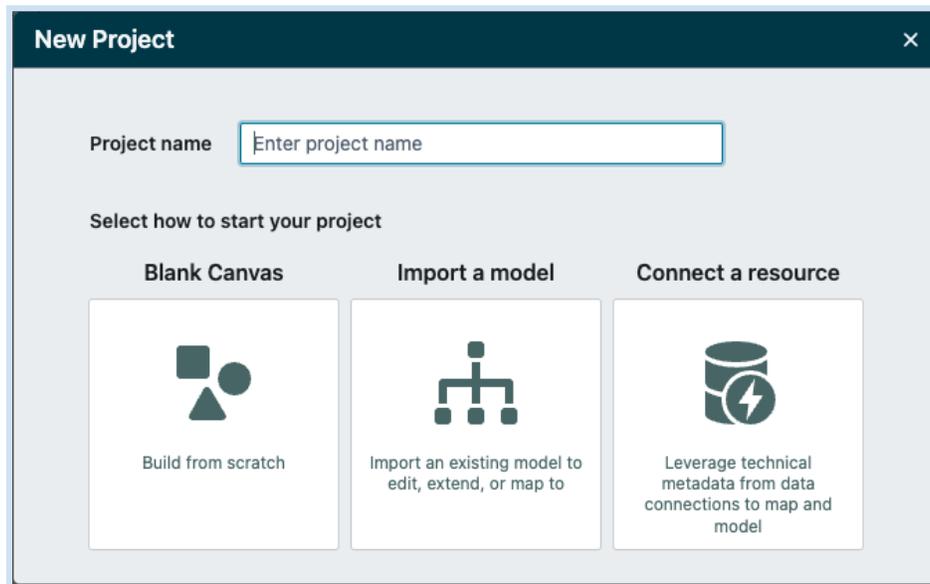
#### Step 1 - Open Designer

- 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:

Attributes		
Attribute Name	Data Type	Rule
<input type="text" value=""/>		<input type="button" value="Add"/>
email	string	Create
first_name	string	Create
last_name	string	Create
ssn	string	Create

## Step 2 - Create Product Class

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

Attributes		
Attribute Name	Data Type	Rule
<input type="text"/>		<input type="button" value="Add"/>
dept	integer	Create
desc	string	Create
msrp	float	Create
product	string	Create
vendor	string	Create

## 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>

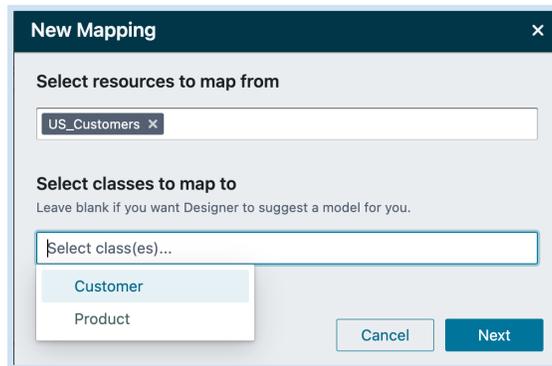
## Exercise 3 - Upload Your Data

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`.



**New Mapping** [X]

Select resources to map from

US\_Customers [X]

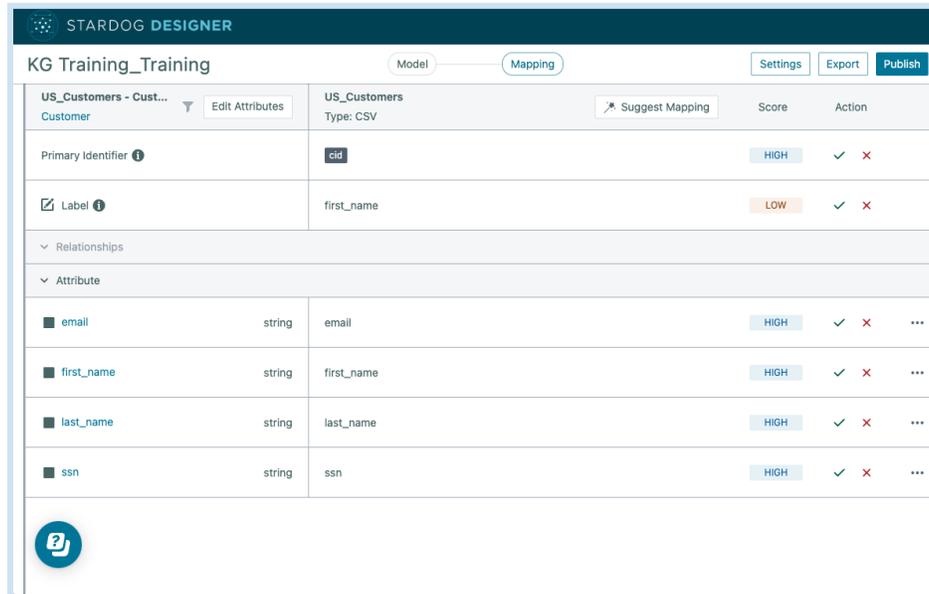
Select classes to map to  
Leave blank if you want Designer to suggest a model for you.

Select class(es)...

- Customer
- Product

Cancel Next

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



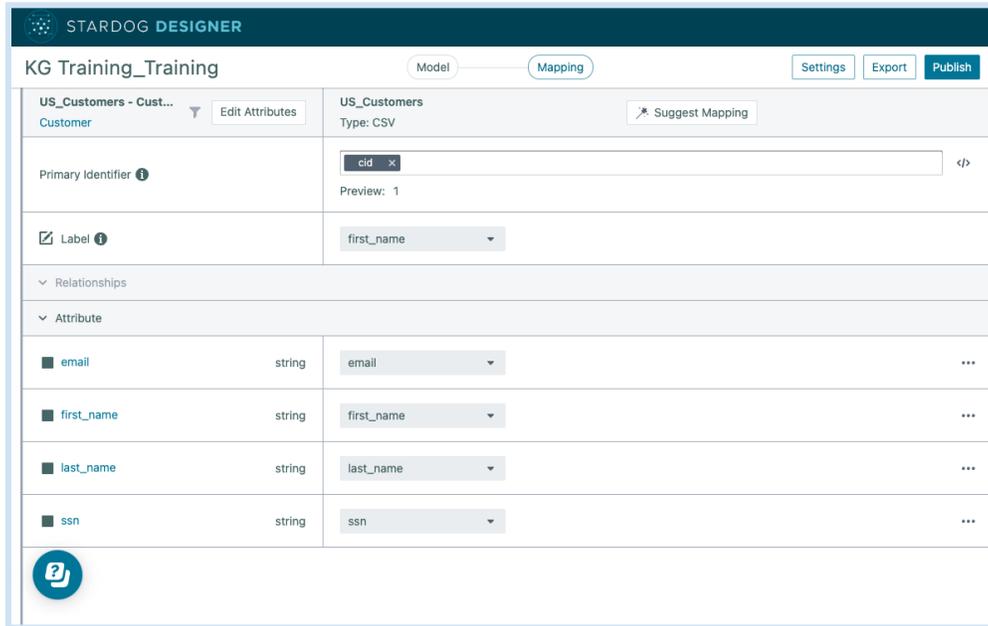
STARDOG DESIGNER

KG Training\_Training

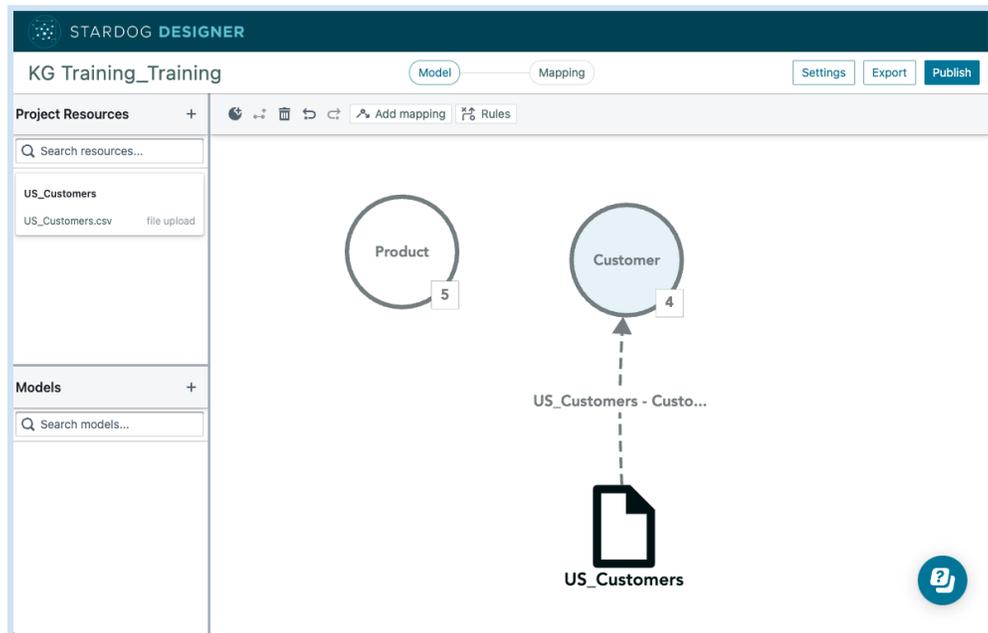
Model Mapping Settings Export Publish

US_Customers - Cust... Customer	US_Customers Type: CSV	Suggest Mapping	Score	Action
Primary Identifier ⓘ	cid		HIGH	✓ ✕
Label ⓘ	first_name		LOW	✓ ✕
Relationships				
Attribute				
email	string	email	HIGH	✓ ✕ ...
first_name	string	first_name	HIGH	✓ ✕ ...
last_name	string	last_name	HIGH	✓ ✕ ...
ssn	string	ssn	HIGH	✓ ✕ ...

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



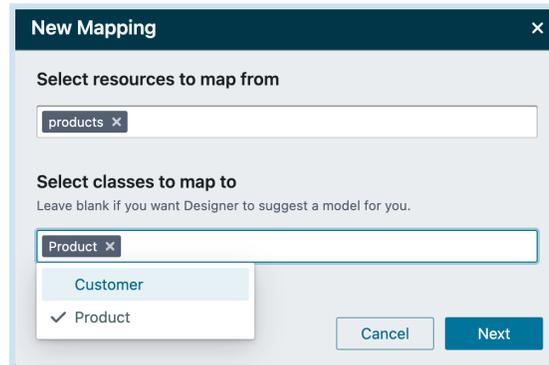
- Click on Model to view the mapping in the canvas.



## 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`.



**New Mapping** [X]

Select resources to map from

products [X]

Select classes to map to

Leave blank if you want Designer to suggest a model for you.

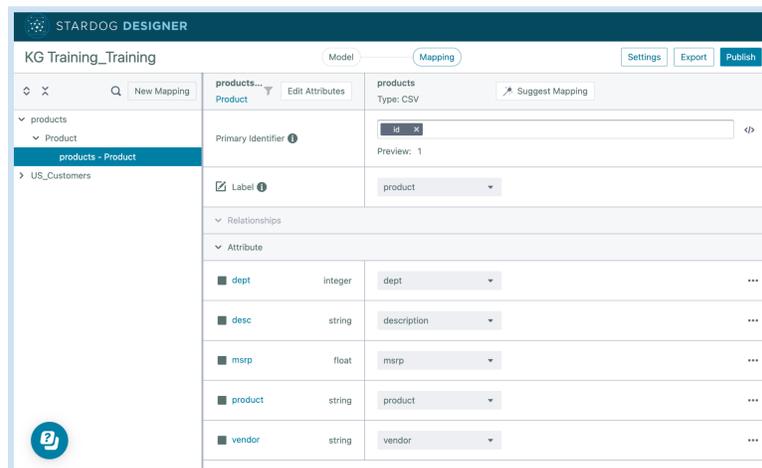
Product [X]

Customer

✓ Product

Cancel Next

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



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KG Training\_Training

Model Mapping Settings Export Publish

products... Product Edit Attributes products Type: CSV Suggest Mapping

Primary Identifier id [X] Preview: 1

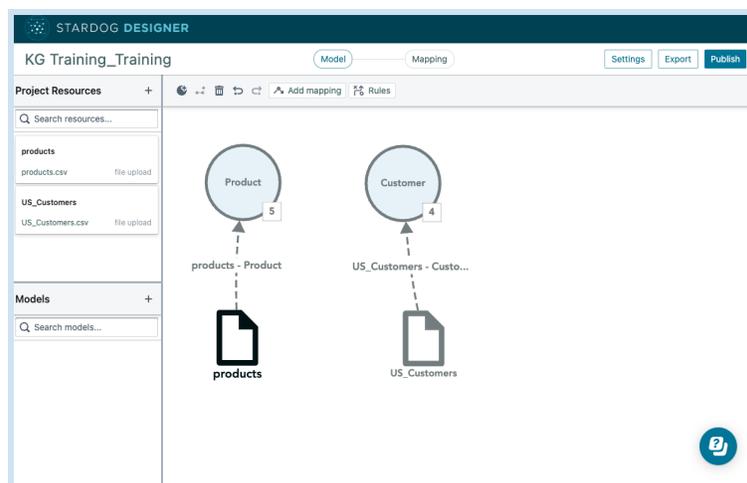
Label [X] product

Relationships

Attribute

dept	integer	dept	...
desc	string	description	...
msrp	float	msrp	...
product	string	product	...
vendor	string	vendor	...

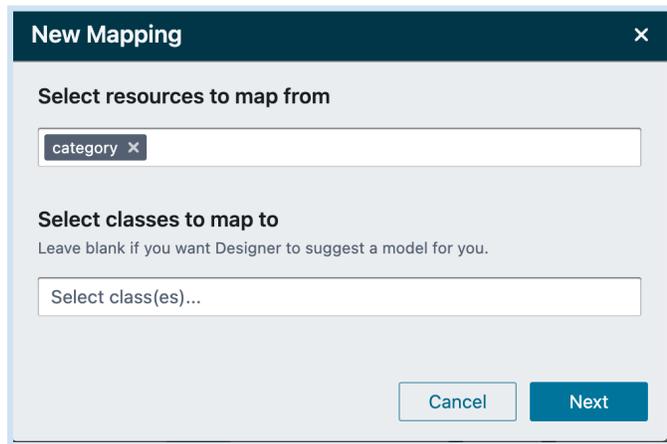
- Click on Model to view the mapping in the canvas.



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`.



**New Mapping** [X]

Select resources to map from

category [X]

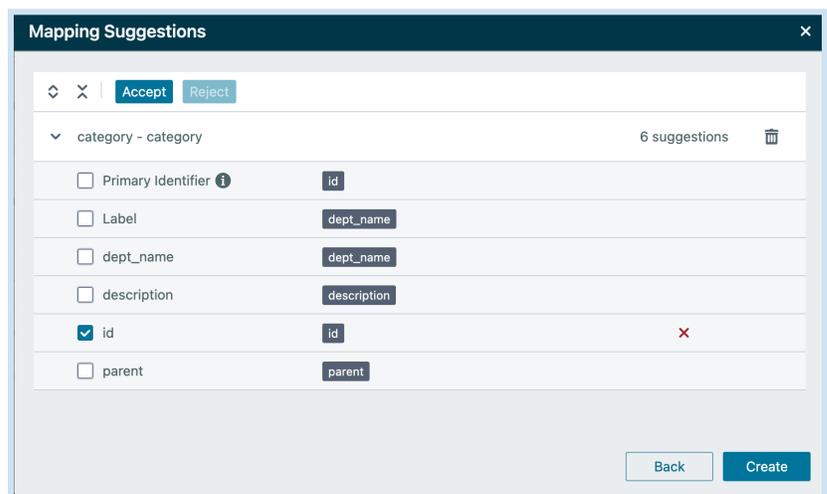
Select classes to map to

Leave blank if you want Designer to suggest a model for you.

Select class(es)...

Cancel Next

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



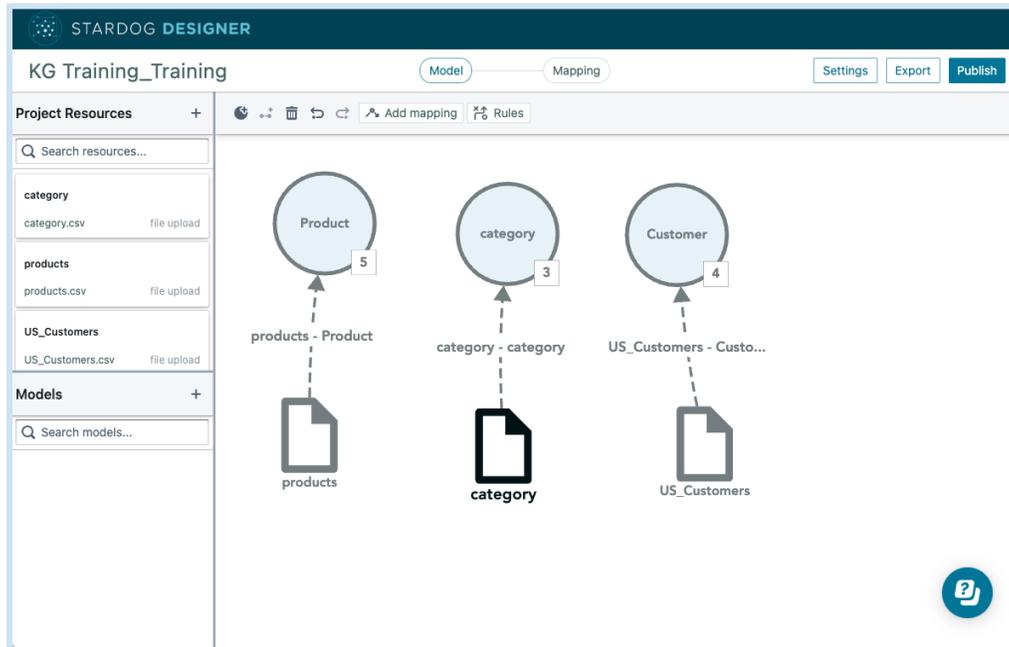
**Mapping Suggestions** [X]

Accept Reject

category - category 6 suggestions [trash]

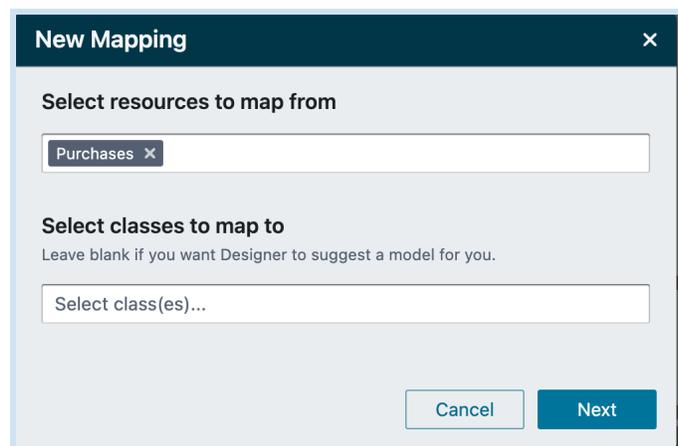
<input type="checkbox"/>	Primary Identifier ⓘ	id	
<input type="checkbox"/>	Label	dept_name	
<input type="checkbox"/>	dept_name	dept_name	
<input type="checkbox"/>	description	description	
<input checked="" type="checkbox"/>	id	id	[X]
<input type="checkbox"/>	parent	parent	

Back 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`.



### Mapping Suggestions ✕

✕ | Accept Reject

▼ Purchases - Purchases 11 suggestions 🗑️

<input type="checkbox"/>	Primary Identifier <span style="font-size: small;">i</span>	id	
<input type="checkbox"/>	Label	id	
<input type="checkbox"/>	card	card	
<input type="checkbox"/>	cid	cid	
<input type="checkbox"/>	date	date	
<input checked="" type="checkbox"/>	id	id	✕
<input type="checkbox"/>	pid	pid	
<input type="checkbox"/>	price	price	
<input type="checkbox"/>	quantity	quantity	
<input type="checkbox"/>	reward_account	reward_account	
<input checked="" type="checkbox"/>	time	time	✕

Back
Create

- Click on `Create`.

STARDOG DESIGNER

Model
Mapping

Settings
Export
Publish

### KG Training\_Training

Project Resources +
🗑️ 🔄 🏠 Add mapping 📄 Rules

**category**

category.csv file upload

**products**

products.csv file upload

**Purchases**

Purchases.csv file upload

**Models** +



products - Product



products



category - category



category



Purchases - Purchases



Purchases



US\_Customers - Custo...



US\_Customers

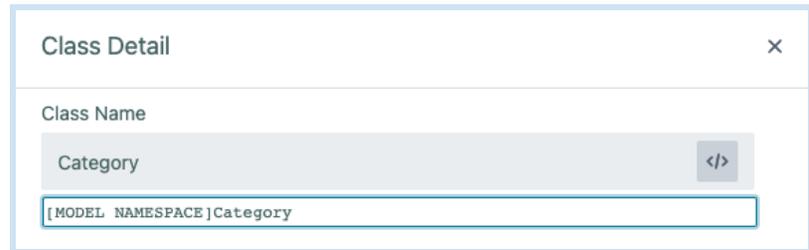
9

## 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.

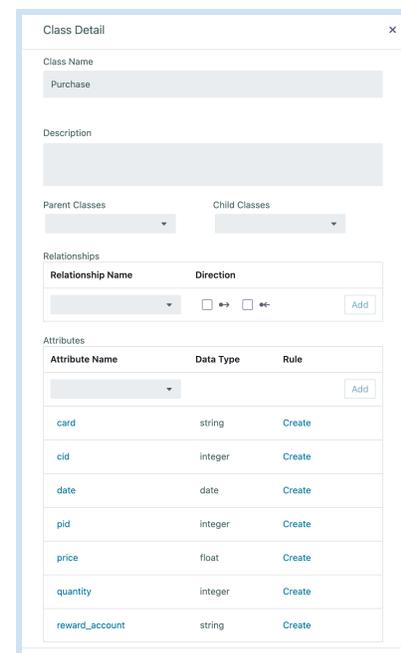


### Step 2 - Edit Customer class

- 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`.



Attribute Name	Data Type	Rule
card	string	Create
cid	integer	Create
date	date	Create
pid	integer	Create
price	float	Create
quantity	integer	Create
reward_account	string	Create

- 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**

Create Relationship
×

---

Relationship Name

Description

Source

×

Target

×

## 2. Relationship: **for product**

Create Relationship
×

---

Relationship Name

for product

Description

Source

▼

Purchase ×

Target

▼

Product ×

Source	Target
Purchase	Product

Cancel
Create

## 3. Relationship: **in category**

Create Relationship
×

---

Relationship Name

in category

Description

Source

▼

Product ×

Target

▼

Category ×

Source	Target
Product	Category

Cancel
Create

#### 4. Relationship: **parent category**

Create Relationship
✕

---

Relationship Name

parent category

Description

Source

▼

Category ✕

Target

▼

Category ✕

Source	Target
Category	Category

Cancel

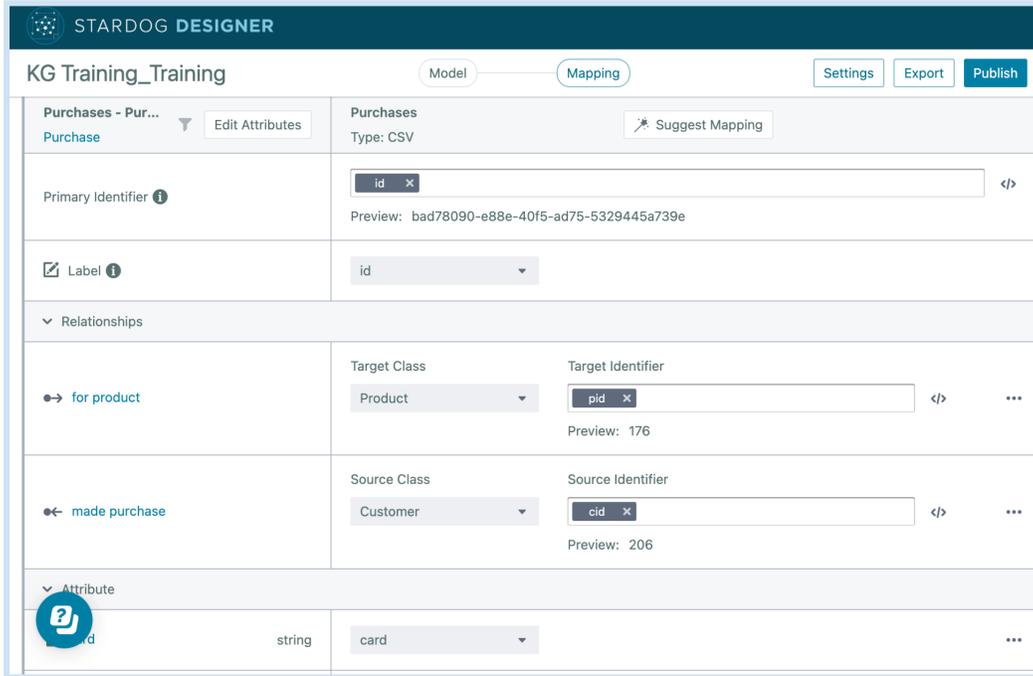
Create

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.

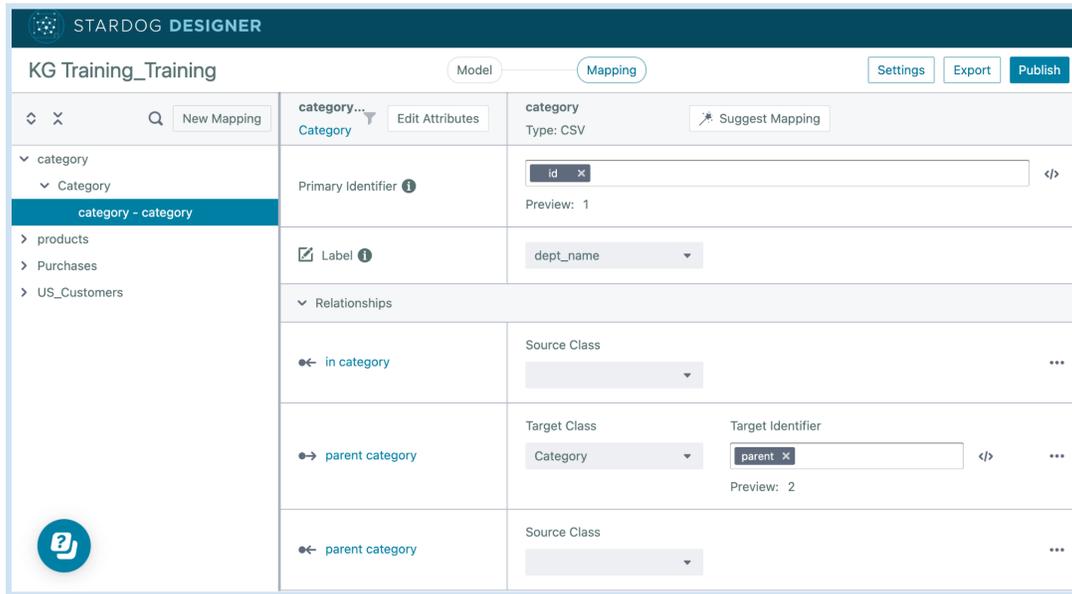


The screenshot shows the Stardog Designer interface for a Knowledge Graph (KG) named 'Training\_Training'. The 'Mapping' tab is active, showing a dataset named 'Purchases' of type 'CSV'. The interface is divided into several sections:

- Primary Identifier:** A text input field containing 'id' with a preview of a UUID: 'bad78090-e88e-40f5-ad75-5329445a739e'.
- Label:** A dropdown menu set to 'id'.
- Relationships:**
  - for product:** Target Class is 'Product', Target Identifier is 'pid' with a preview of '176'.
  - made purchase:** Source Class is 'Customer', Source Identifier is 'cid' with a preview of '206'.
- Attribute:** A dropdown menu set to 'card'.

### 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.

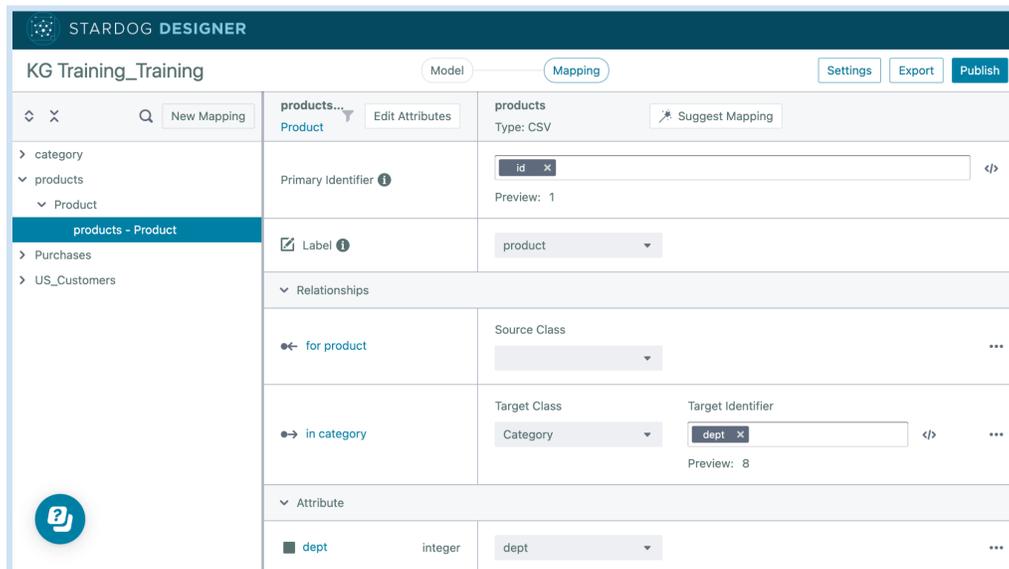


The screenshot shows the Stardog Designer interface for a Knowledge Graph named 'KG Training\_Training'. The 'Mapping' tab is active, showing the configuration for the 'category' class. The left sidebar shows a tree view with 'category' expanded to 'category - category'. The main panel shows the following configuration:

- Primary Identifier:** id
- Label:** dept\_name
- Relationships:**
  - in category:** Source Class is empty.
  - parent category:** Target Class is 'Category', Target Identifier is 'parent'.
  - parent category:** Source Class is empty.

#### 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.

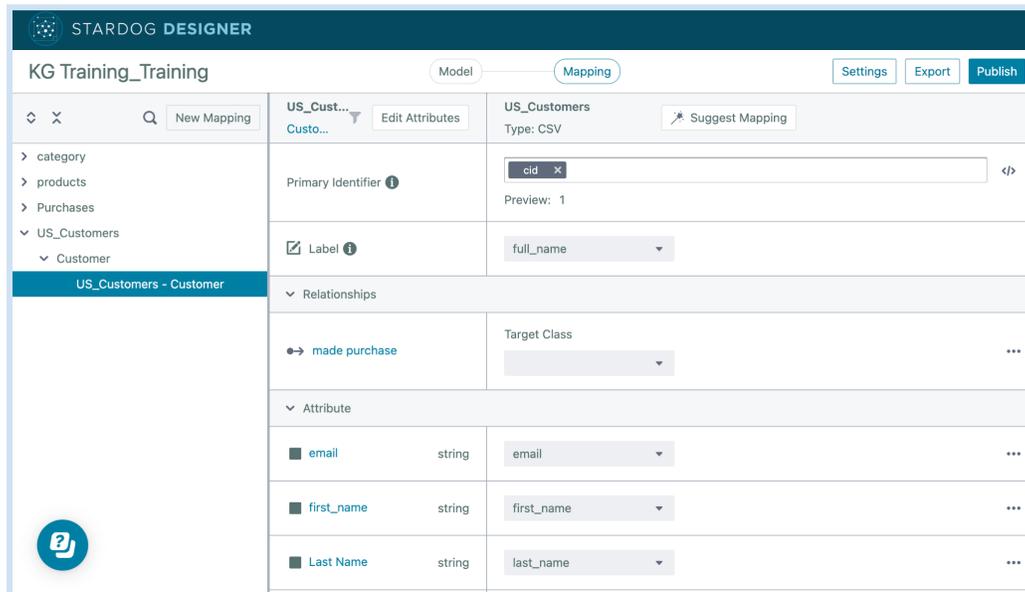


The screenshot shows the Stardog Designer interface for the same Knowledge Graph, but now the 'Mapping' tab is showing the configuration for the 'products' class. The left sidebar shows 'products' expanded to 'products - Product'. The main panel shows the following configuration:

- Primary Identifier:** id
- Label:** product
- Relationships:**
  - for product:** Source Class is empty.
  - in category:** Target Class is 'Category', Target Identifier is 'dept'.
- Attribute:**
  - dept:** integer, value: dept

## 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

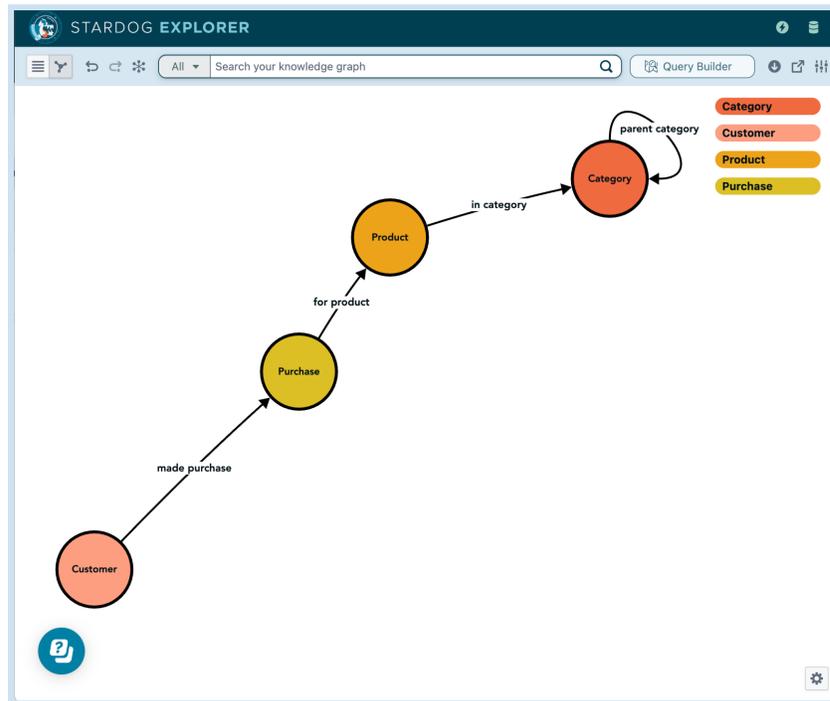
In this step, you will publish your project so that you can view it in Stardog Explorer. This allows you to see the model and view the mapped data. This is a good way to validate your work.

### 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](https://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.

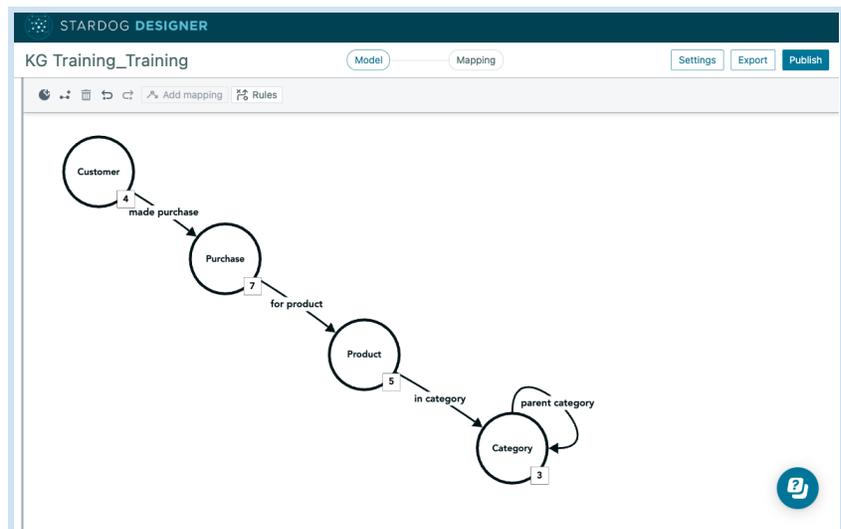
## Exercise 7 - Create a new project and import a model

### Step 1 - Open Designer

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

### Step 2 - Create a new project

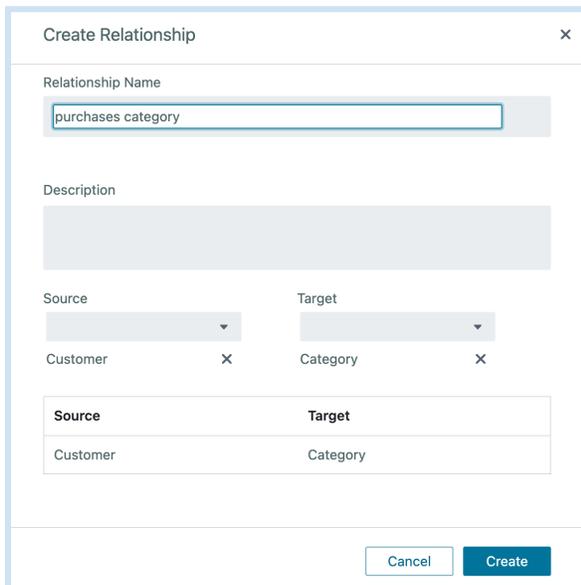
- From the Designer home screen, click on the `New` button in the upper right corner.
- **Project name:** Rules KG Training [Your initials]
- Select the option to `Import a model`
- Select the **database** you created when publishing your project (such as KG\_Training\_[Your initials]).
- Select the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



Create Relationship

Relationship Name  
purchases category

Description

Source Target  
Customer X Category X

Source	Target
Customer	Category

Cancel Create

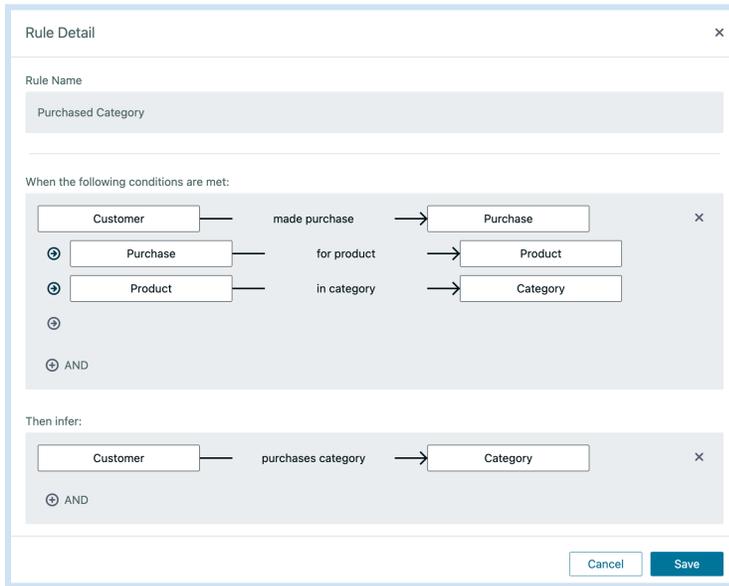
## Inference Rules

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

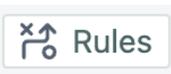


**Please Note:** It is a good best practice to publish the model frequently during development to validate changes by viewing it in Explorer.

## Step 2 - Create classes referenced below

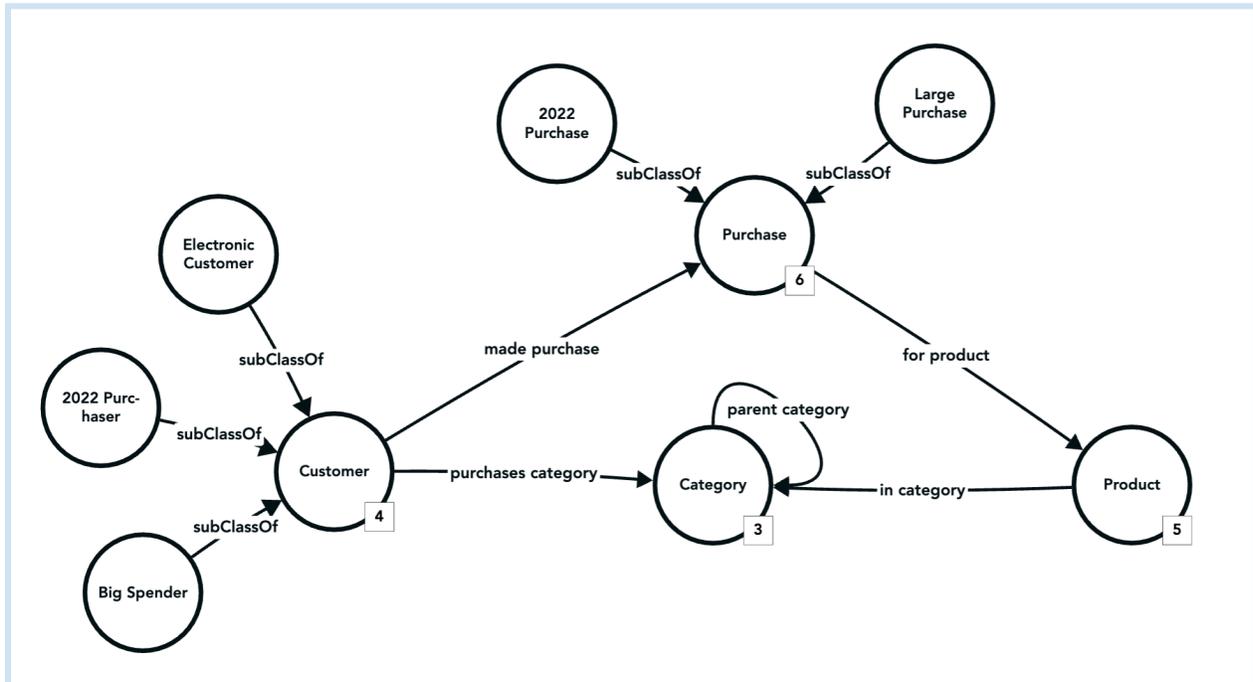
- Remember to create a class, click on the  icon in the Designer toolbar.

## Step 3 - Create rules referenced below

- To create a rule, click on the  icon in the Designer toolbar.

Create Class	Create Rule
<p><b>Class Name:</b> Electronic Customer</p> <p><b>Description:</b></p> <p><b>Parent Class:</b> Customer</p>	<p><b>Rule Name:</b> Electronic Users</p> <p><b>Conditions:</b></p> <p>Customer - purchases category → Category</p> <p>Category - dept_name = Electronics</p> <p><b>Then infer:</b> Customer Classify As Electronic Customer</p>

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



## 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](https://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.

