
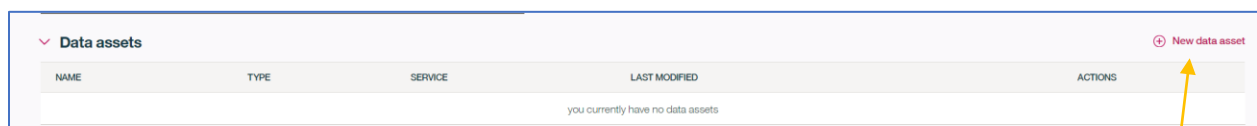


Watson Studio SPSS Modeler Overview

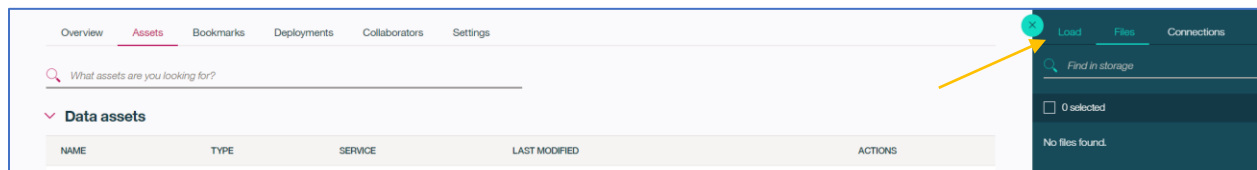
This lab will introduce the SPSS Modeler capability using the Titanic dataset. The lab will guide the development of an SPSS Modeler stream that will prepare the input data for modeling to run a machine learning algorithm predicting survivability of a passenger on the Titanic.

Step 1: Adding a Data Asset to the Watson Studio Labs project

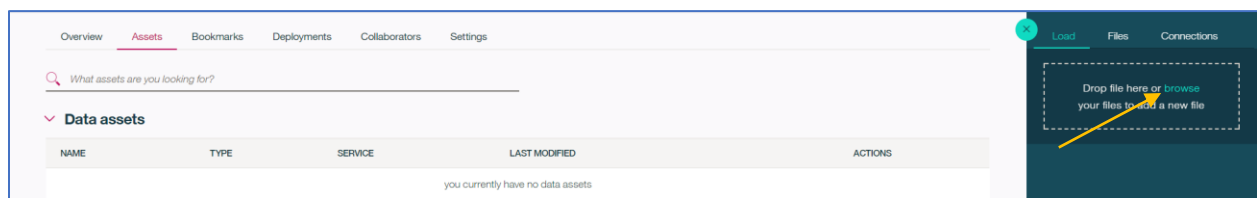
1. For this lab, you will use the **titanic.csv** data set that was downloaded and extracted in Lab-1.
2. In the Watson Studio Labs project **Data assets** section, click on **New data asset**, or if you don't see **New data asset**, click on the  icon.



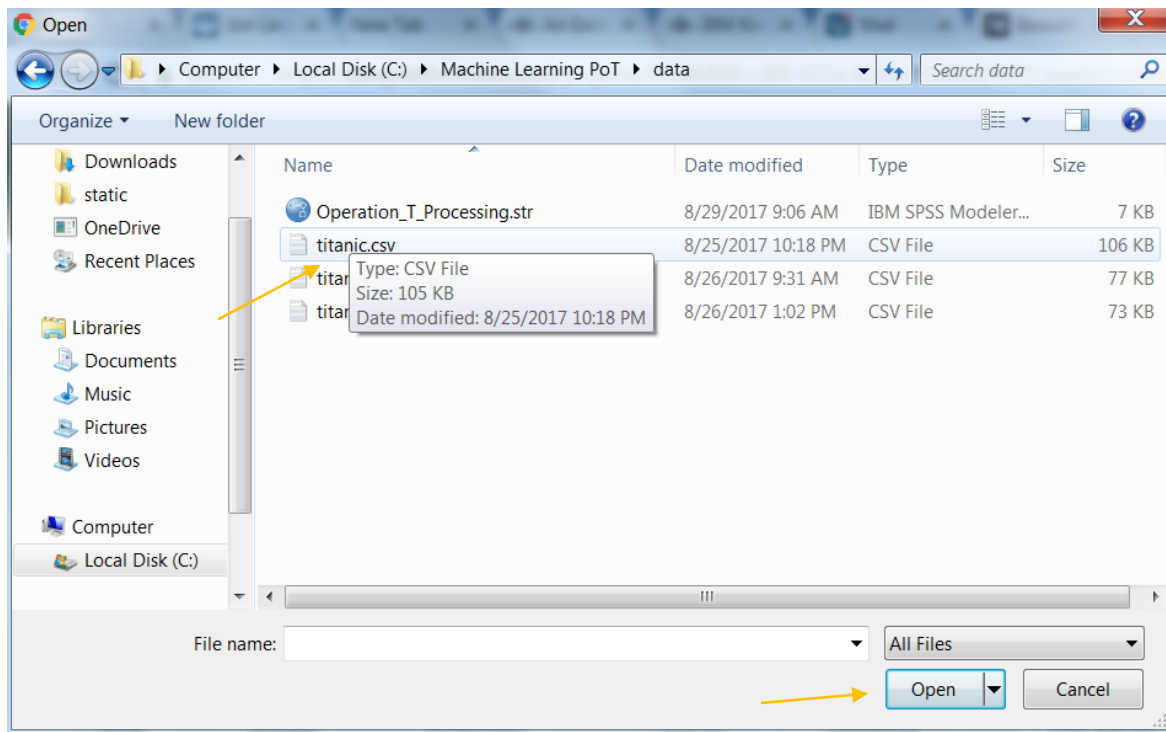
3. Click on the **Load** tab.



4. Click on **browse**.



5. Go to the folder where the **titanic_csv** file is stored. Select the **titanic.csv** file and then click **Open**.



6. The file is now added as a Data Asset.

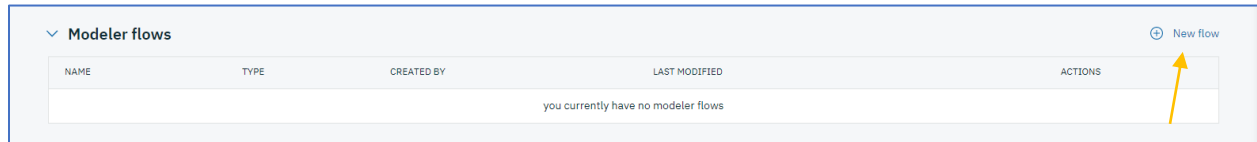
| Data assets | | | | | | New data asset |
|-------------------------------------|-------------|------------|---------|------------|------------------------|----------------|
| 0 assets selected. | | | | | | |
| <input type="checkbox"/> | NAME | TYPE | SERVICE | CREATED BY | LAST MODIFIED | ACTIONS |
| <input checked="" type="checkbox"/> | titanic.csv | Data Asset | Project | Michael | 7 Feb 2018, 5:01:18 pm | ⋮ |

Step 2: Create a Model to predict survival

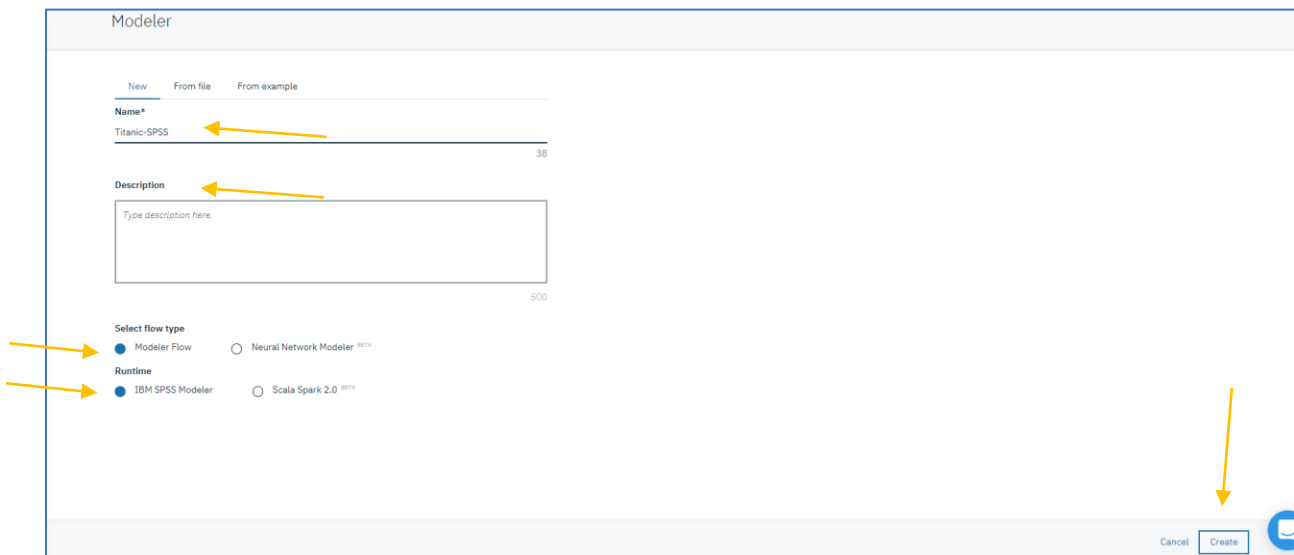
In this section, we will create a Machine Learning flow using SPSS nodes. Documentation describing the nodes is available at <https://dataplatform.ibm.com/docs/content/analyze-data/ml-canvas-spss.html?context=analytics>.

Step 2.1 Create a New Flow and Load the Data

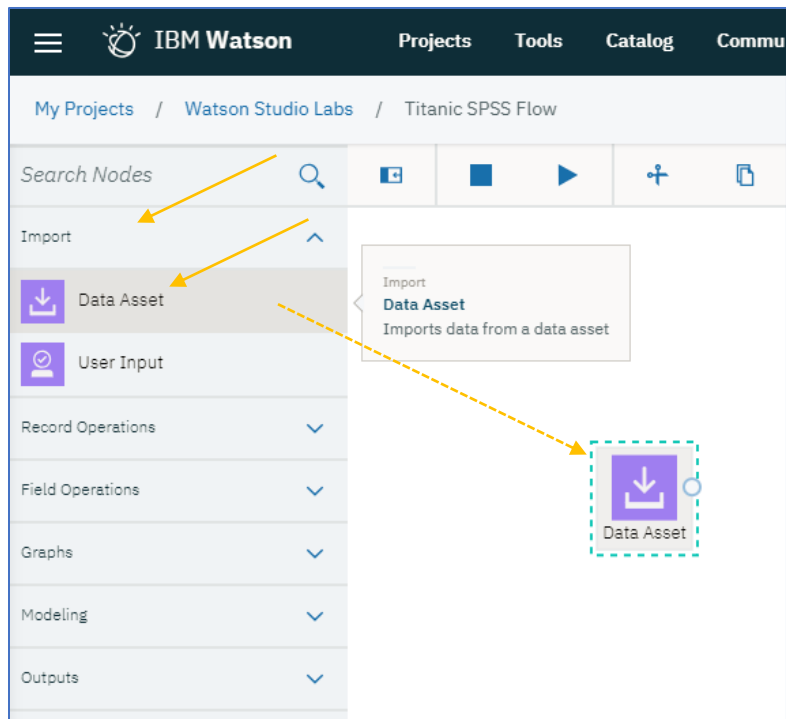
1. In the Watson Studio project, click on **New flow** in the **Modeler flows** section.



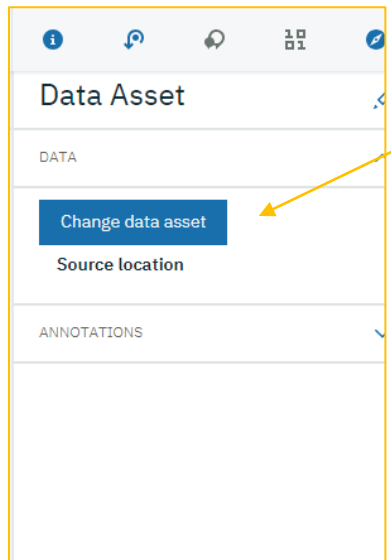
2. Enter a **Name** for the flow, optionally enter a **Description**, click on Modeler Flow for the **flow type** (should be the default), click on IBM SPSS Modeler for the **Runtime** (should be the default), and click on **Create**.



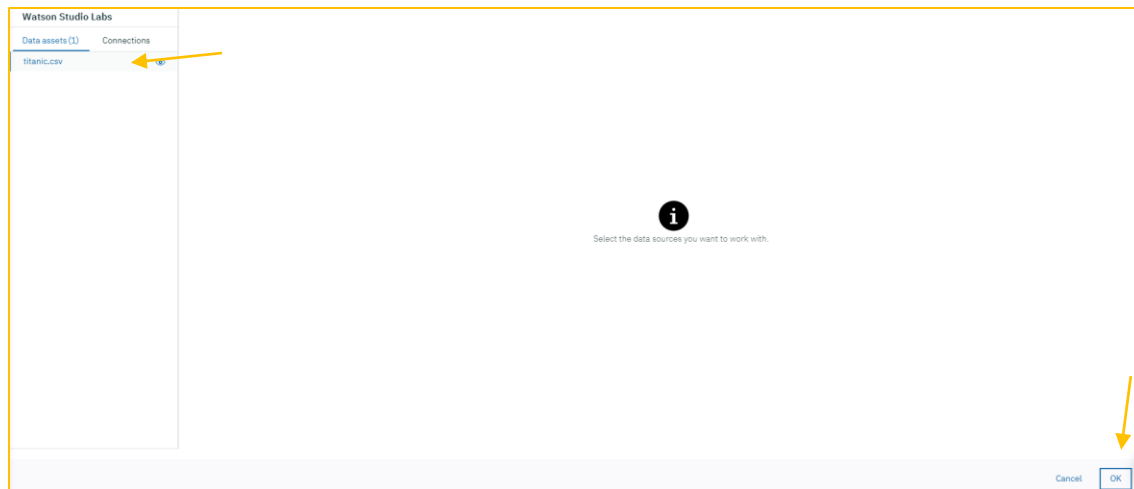
3. This opens the Flow Editor. Click on **Import** and then **Data Asset** and hold the left mouse key on the Data Asset icon and **drag it onto the left side of the canvas**. Release the left mouse key.



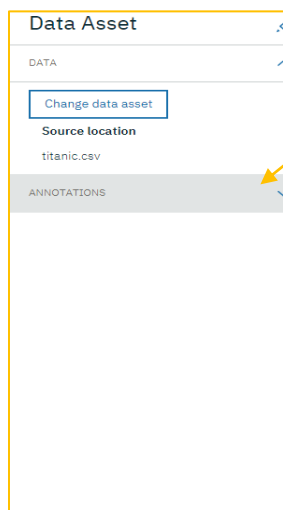
4. Double click on the **Data Asset**. In the window pane on the right-hand-side click on **Change data asset**.



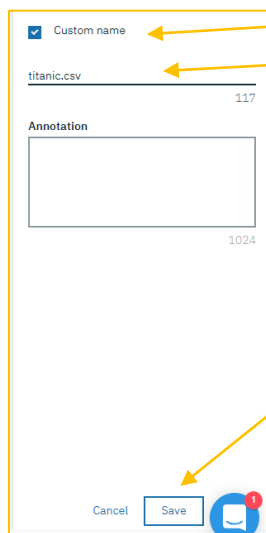
5. Select the **titanic.csv** option, and click **OK**.



6. Click on **Annotation**.




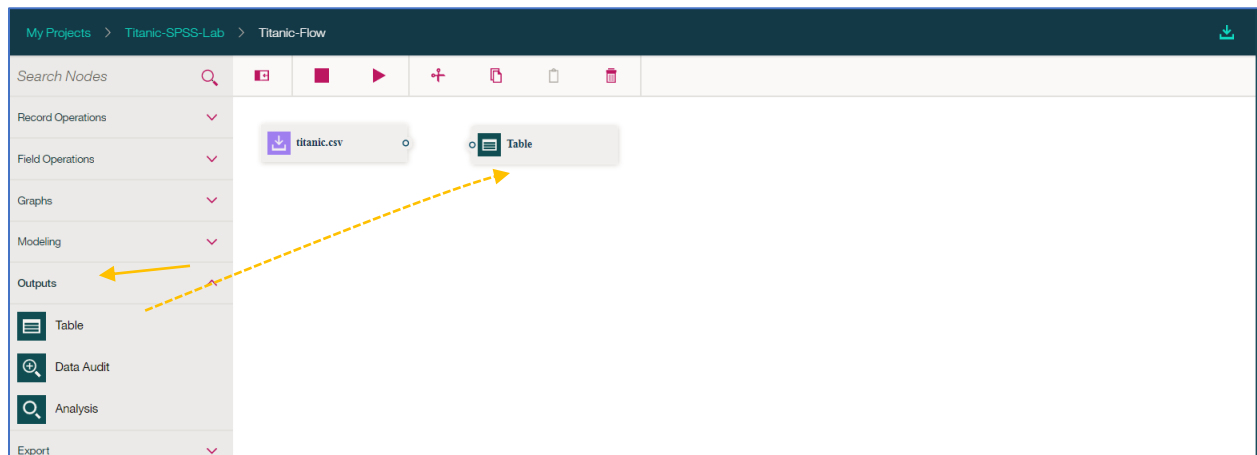
7. Click on **Custom name**, and type **titanic.csv**, and click on **Save**.



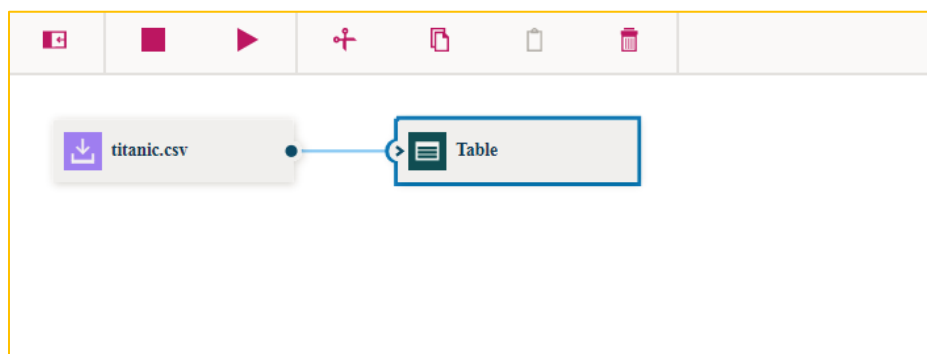
8. Note, the depiction of the flow nodes in the user interface has slightly changed from what is shown in this document. The text in the UI is now below the icon, instead of to the right.



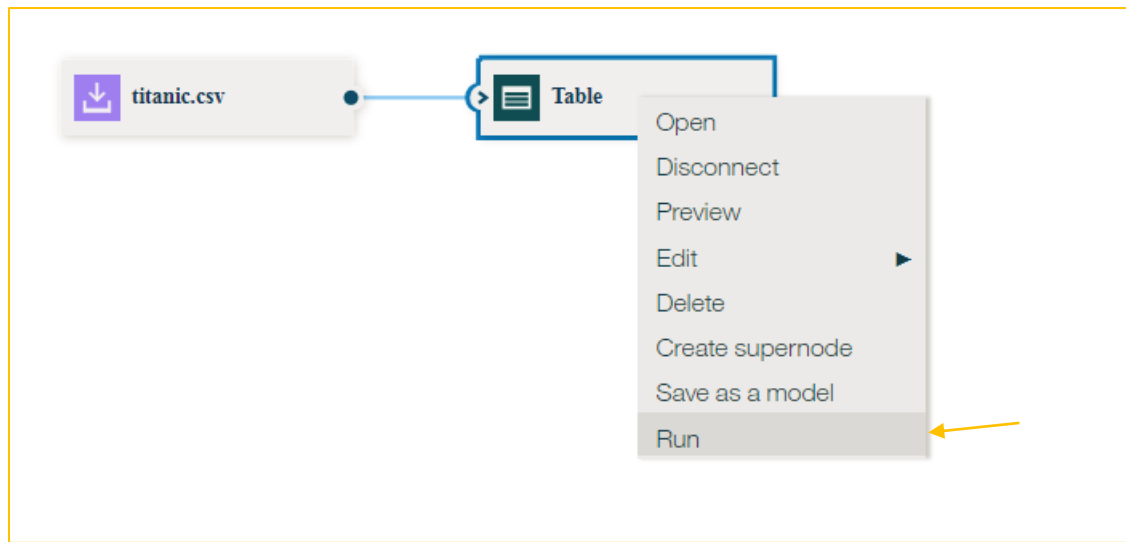
9. Click on the **Outputs** menu item in the Node Palette on the left and then click on the **Table** icon and drag the icon to the right of the titanic.csv icon. The SPSS Table node will display the contents of the csv file. If the Node Palette is not visible, click on the Node Palette icon 




10. Connect the right side of the titanic.csv icon to the left side of the Table icon. This is accomplished by clicking on the little circle at the right side of the titanic.csv icon holding the left mouse key and dragging the mouse to the little circle on the left side of the Table icon, and then releasing the left mouse key.



11. Right click on the **Table** icon, and select **Run**.



12. The “Running Flow” prompt will appear and then when completed a Table output selection will appear on the right side of the screen under the **Outputs** tab. If the Table output selection does not appear, select the  icon.




13. Double click on the Table selection and the contents of the titanic.csv will be displayed. Each row contains information on a passenger on the Titanic. We will use this data to make predictions on survivability.

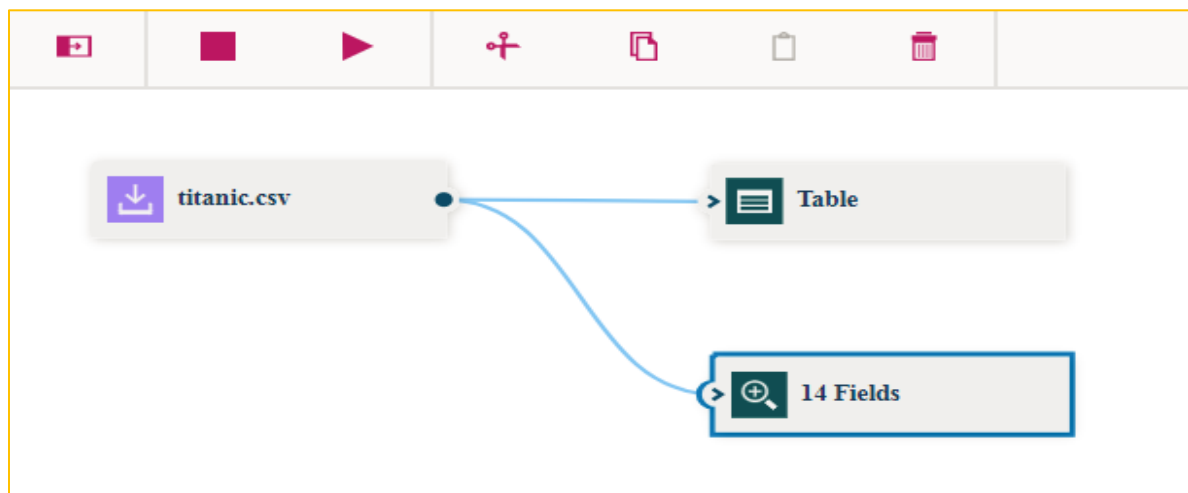
| PCLASS | SURVIVED | NAME | SEX | AGE | SIBSP | PARCH | TICKET | FARE | CABIN | EMBARKED | BOAT |
|--------|----------|------------------------|--------|--------|-------|-------|----------|----------|---------|----------|------|
| 1 | 1 | Allen, Miss. Elisabeth | female | 29 | 0 | 0 | 24100 | 211.3375 | B5 | S | 2 |
| 1 | 1 | Allison, Master. Huds | male | 0.9167 | 1 | 2 | 113781 | 151.55 | C22 C26 | S | 11 |
| 1 | 0 | Allison, Miss. Helen L | female | 2 | 1 | 2 | 113781 | 151.55 | C22 C26 | S | |
| 1 | 0 | Allison, Mr. Hudson J | male | 30 | 1 | 2 | 113781 | 151.55 | C22 C26 | S | |
| 1 | 0 | Allison, Mrs. Hudson | female | 25 | 1 | 2 | 113781 | 151.55 | C22 C26 | S | |
| 1 | 1 | Anderson, Mr. Harry | male | 48 | 0 | 0 | 19952 | 26.55 | E12 | S | 3 |
| 1 | 1 | Andrews, Miss. Korn | female | 63 | 1 | 0 | 13502 | 77.9583 | D7 | S | 10 |
| 1 | 0 | Andrews, Mr. Thoma | male | 39 | 0 | 0 | 112050 | 0 | A36 | S | |
| 1 | 1 | Appleton, Mrs. Edwa | female | 53 | 2 | 0 | 11769 | 51.4792 | C101 | S | 0 |
| 1 | 0 | Artagaveytia, Mr. Rar | male | 71 | 0 | 0 | PC 17609 | 49.5042 | | C | |
| 1 | 0 | Astor, Col. John Jacc | male | 47 | 1 | 0 | PC 17757 | 227.525 | C82 C84 | C | |
| 1 | 1 | Astor, Mrs. John Jacc | female | 18 | 1 | 0 | PC 17757 | 227.525 | C82 C84 | C | 4 |
| 1 | 1 | Aubart, Mme. Leonie | female | 24 | 0 | 0 | PC 17477 | 69.3 | B35 | C | 9 |
| 1 | 1 | Barber, Miss. Ellen ? | female | 26 | 0 | 0 | 19877 | 78.85 | | S | 6 |
| 1 | 1 | Barkworth, Mr. Alger | male | 80 | 0 | 0 | 27042 | 30 | A23 | S | 8 |

Page 1 / 7

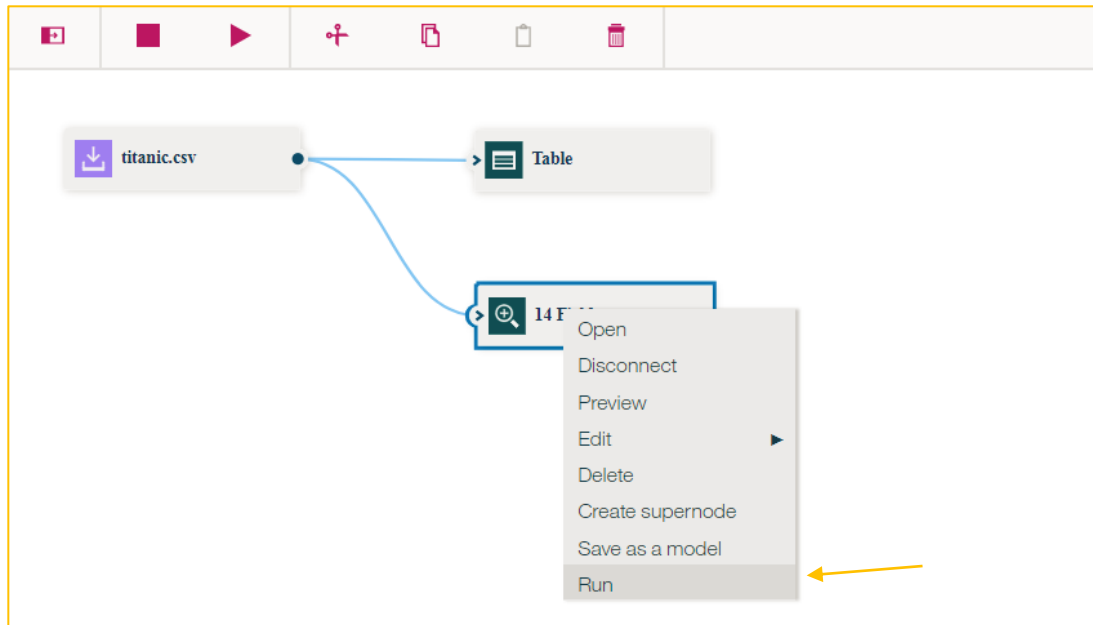
Step 2.2 Explore the Data using the Data Audit Node


Perusing through the data in the table, we can see that there are missing values. The SPSS Modeler has a Data Audit node that provides profiling information on the input data that is useful for cleansing the data. It provides a comprehensive first look at the data, including summary statistics, as well as information about outliers, missing values, and extremes.

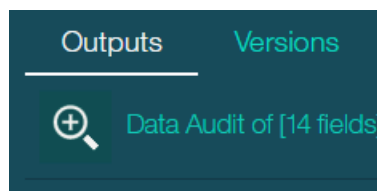
1. Add a **Data Audit** node to the flow clicking on the **Outputs** menu item in the Node Palette, and then dragging the **Data Audit** node to underneath the titanic.csv node. If the Node Palette is not visible, click on the Node Palette icon . Connect the titanic.csv node to the Data Audit node. The canvas should appear as below.



2. Right click on the **Data Audit** node and click **Run**.



3. The “Running Flow” prompt will appear and then when completed a Data Audit output selection will appear on the right side of the screen under the **Outputs** tab. If the **Outputs** tab doesn't display, click on the  icon.




4. Double click on the **Data Audit of [14 fields]** to view the Data Audit output. We can see that several fields have many missing values (cabin, boat,body,home.dest). These fields will be removed using a **Filter** node below. Other fields have only a few missing values (fare, embarked, age). The rows containing the missing values will be removed using a **Select** node below.

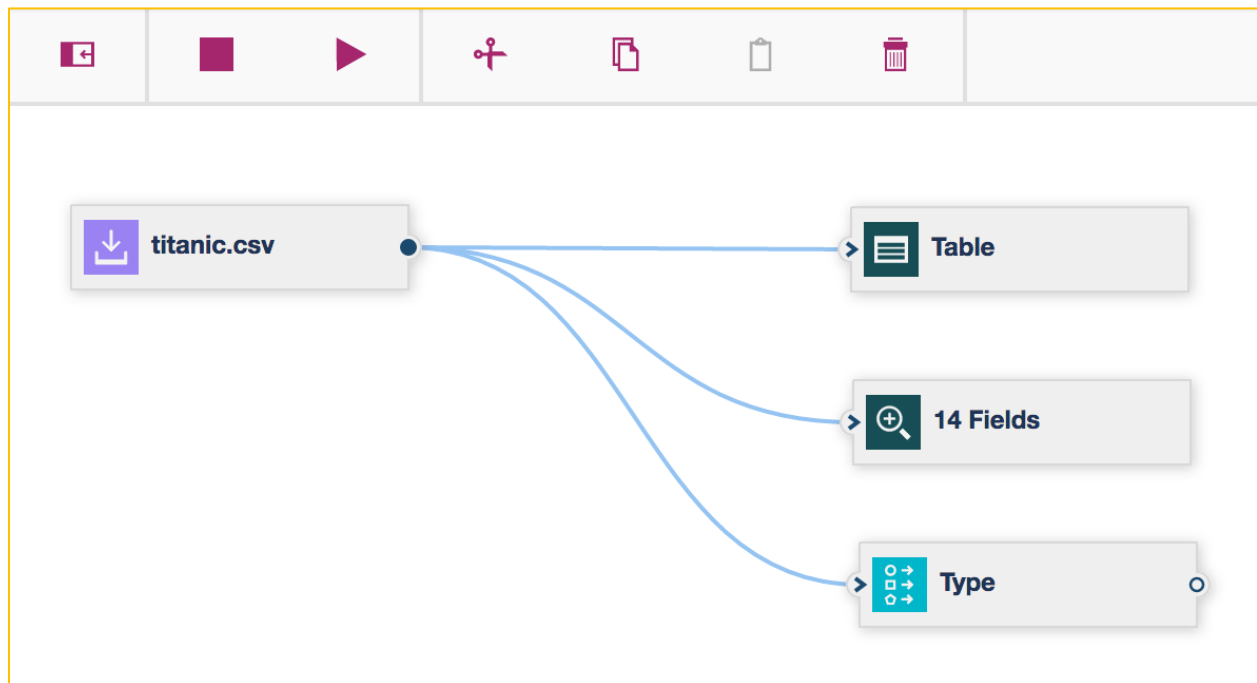
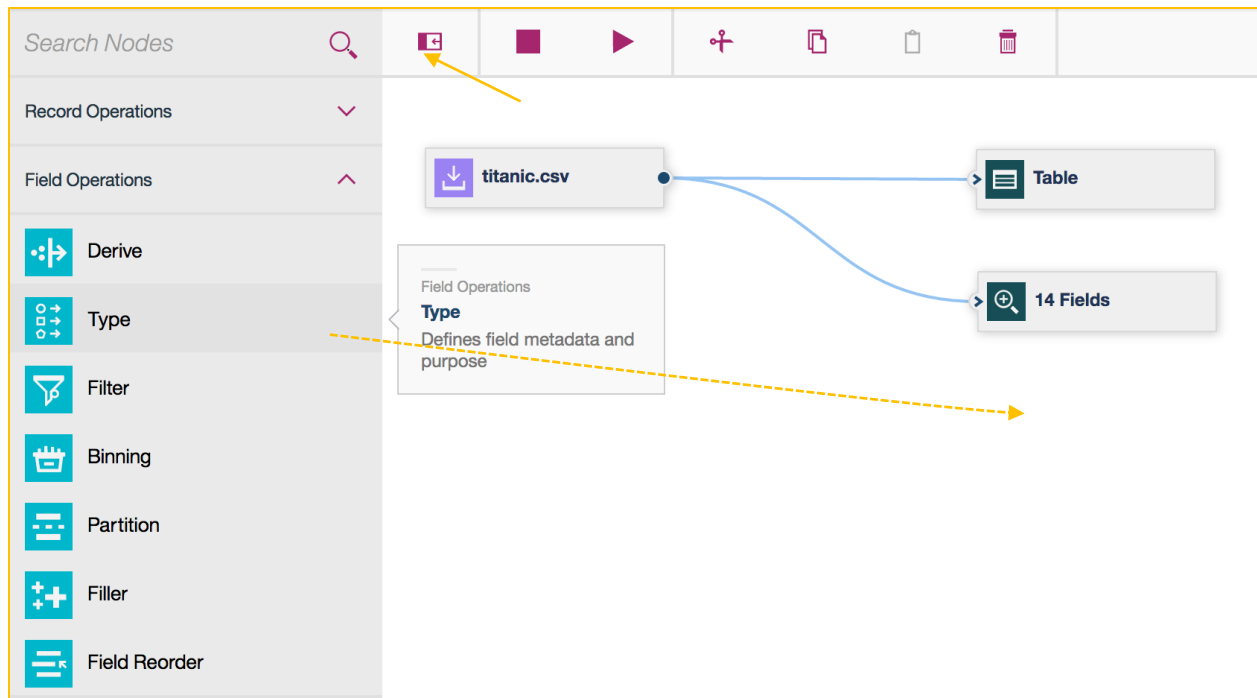
| | Field | Graph | Measurement | Min | Max | Mean | Std. Dev | Skewness | Unique | Valid |
|----|-----------|-------|-------------|-------|---------|---------|----------|----------|--------|-------|
| 1 | pclass | | Continuous | 1 | 3 | 2.295 | 0.838 | -0.599 | -- | 1309 |
| 2 | survived | | Continuous | 0 | 1 | 0.382 | 0.486 | 0.486 | -- | 1309 |
| 3 | name | | Categorical | -- | -- | -- | -- | -- | -- | 1309 |
| 4 | sex | | Categorical | -- | -- | -- | -- | -- | 2 | 1309 |
| 5 | age | | Continuous | 0.167 | 80.000 | 29.881 | 14.413 | 0.408 | -- | 1046 |
| 6 | sibsp | | Continuous | 0 | 8 | 0.499 | 1.042 | 3.844 | -- | 1309 |
| 7 | parch | | Continuous | 0 | 9 | 0.385 | 0.866 | 3.669 | -- | 1309 |
| 8 | ticket | | Categorical | -- | -- | -- | -- | -- | -- | 1309 |
| 9 | fare | | Continuous | 0.000 | 512.329 | 33.295 | 51.759 | 4.368 | -- | 1308 |
| 10 | cabin | | Categorical | -- | -- | -- | -- | -- | 186 | 295 |
| 11 | embarked | | Categorical | -- | -- | -- | -- | -- | 3 | 1307 |
| 12 | boat | | Categorical | -- | -- | -- | -- | -- | 27 | 486 |
| 13 | body | | Continuous | 1 | 328 | 160.810 | 97.697 | 0.092 | -- | 121 |
| 14 | home.dest | | Categorical | -- | -- | -- | -- | -- | -- | 744 |

| | Field | Measurement | Outliers | Extremes | Action | Impute Missing | Method | % Complete | Valid Records | Null Value | Empty String | White Space | Blank Value |
|----|----------|-------------|----------|----------|--------|----------------|--------|------------|---------------|------------|--------------|-------------|-------------|
| 1 | pclass | Continuous | 0 | 0 | None | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 2 | survived | Continuous | 0 | 0 | None | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 3 | name | Categorical | -- | -- | -- | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 4 | sex | Categorical | -- | -- | -- | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 5 | age | Continuous | 3 | 0 | None | Never | Fixed | 79.908 | 1046 | 263 | 0 | 0 | 0 |
| 6 | sibsp | Continuous | 28 | 9 | None | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 7 | parch | Continuous | 14 | 10 | None | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 8 | ticket | Categorical | -- | -- | -- | Never | Fixed | 100.000 | 1309 | 0 | 0 | 0 | 0 |
| 9 | fare | Continuous | 34 | 4 | None | Never | Fixed | 99.924 | 1308 | 1 | 0 | 0 | 0 |
| 10 | cabin | Categorical | -- | -- | -- | Never | Fixed | 22.536 | 295 | 1014 | 0 | 0 | 0 |

Step 2.3 Explore the Data using Graph Nodes.

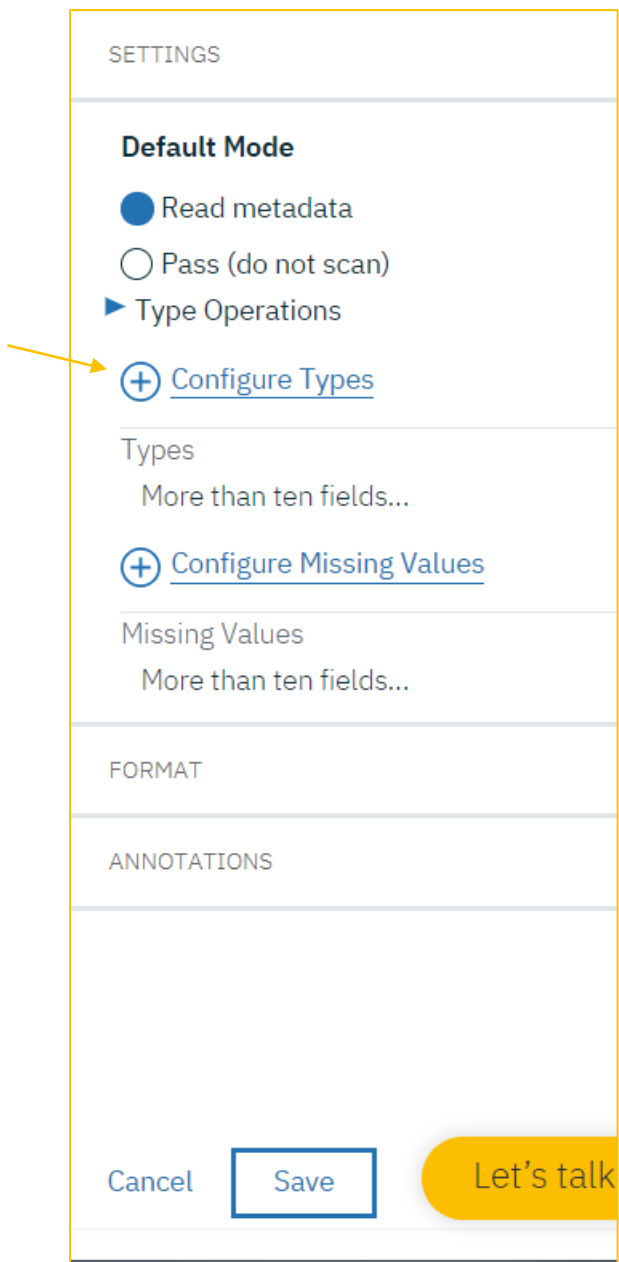
Let's explore the data using Graph Nodes. The Distribution node, and the Histogram node will be used to explore some of the characteristics of the Titanic Data Set. First, we will add a Type node to the canvas. The Type node specifies field metadata and properties. We will change the measurement property for the "pclass" and "survived fields" that was derived as "Continuous" by scanning the data values to "Ordered Set" and "Flag" respectively.

1. Add a **Type** node to the flow by clicking on the **Field Operations** menu item in the Node Palette and then drag the **Type** node underneath the **Data Audit** node. If the Node Palette is not visible, click on the Node Palette icon . Connect the titanic.csv node to the **Type** node. The canvas should appear as below.



2. Double click on the **Type** node. This will open a **Type** menu pallet on the right side of the screen.

3. Select **Configure Types**.





SETTINGS

Default Mode

☒ Read metadata


☐ Pass (do not scan)

▶ Type Operations

  [Configure Types](#)

Types

More than ten fields...

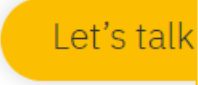
 [Configure Missing Values](#)

Missing Values

More than ten fields...

FORMAT

ANNOTATIONS

Cancel 

4. Select **Add Columns**.

Read Values

Clear All Values

Types

−

+

Add Columns

| Field ^ | Measure ^ | Role ^ | Value mode ^ | Values ^ | Check ^ |
|---------|-----------|--------|--------------|----------|---------|
|---------|-----------|--------|--------------|----------|---------|

Cancel

OK

5. Click on the checkboxes adjacent to the **pclass** and **survived** fields, and then click on **OK**.

Select Fields for Type

Search in column

Field name

Filter:

[Reset](#)

| <input type="checkbox"/> | Field name ^ | Data type ^ |
|-------------------------------------|--------------|-------------|
| <input checked="" type="checkbox"/> | pclass | integer |
| <input checked="" type="checkbox"/> | survived | integer |
| <input type="checkbox"/> | name | string |
| <input type="checkbox"/> | sex | string |
| <input type="checkbox"/> | age | double |
| <input type="checkbox"/> | sibsp | integer |
| <input type="checkbox"/> | parch | integer |
| <input type="checkbox"/> | ticket | string |
| <input type="checkbox"/> | fare | double |
| <input type="checkbox"/> | cabin | string |
| <input type="checkbox"/> | embarked | string |
| <input type="checkbox"/> | boat | string |
| <input type="checkbox"/> | body | integer |
| <input type="checkbox"/> | home.dest | string |

Cancel

OK

- Click on the measurement level field for **pclass** and select **Ordinal**. Click on the measurement level field for **survived** and select **Flag**. Click on **Read Values** after setting the measurement levels . Wait for the flow to complete executing (When the Running Flow pop-up disappears).

Configure Types

Read Values

Clear All Values

Types

⊖ ⊕ Add Columns

| Field ^ | Measure ^ | Role ^ | Value mode ^ | Values ^ | Check ^ |
|----------|-----------|--------|--------------|----------|---------|
| pclass | Ordinal | Input | Read | | None |
| survived | Flag | Input | Read | | None |

7. Click on **OK**.

Configure Types

Read Values

Clear All Values

Types

⊖ ⊕ Add Columns

| Field ^ | Measure ^ | Role ^ | Value mode ^ | Values ^ | Check ^ |
|---------|------------|--------|--------------|-------------|---------|
| fare | Continuous | Input | Specify | 0.0, 512... | None |
| ticket | Typeless | None | Pass | | None |
| sex | Flag | Input | Specify | female, ... | None |
| cabin | Nominal | Input | Specify | A10, A1... | None |

Cancel

OK

8. Click on **Save**.

Type

SETTINGS

Default Mode

☒ Read metadata

☐ Pass (do not scan)

Type Operations

Configure Types

Types

More than ten fields...

Configure Missing Values

Missing Values

More than ten fields...


FORMAT

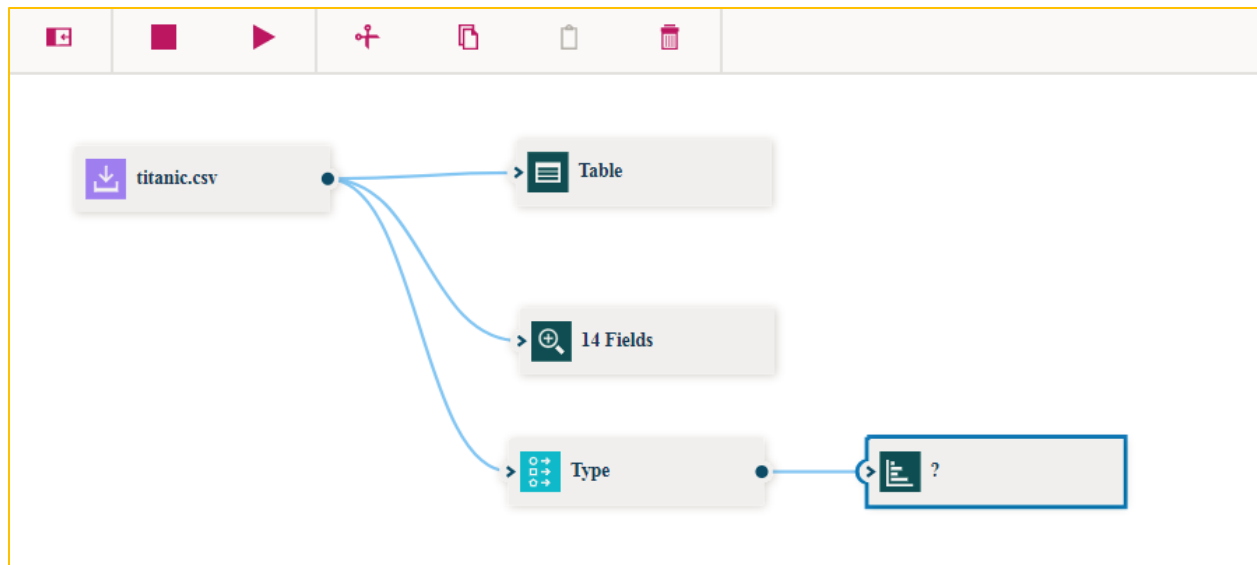
ANNOTATIONS

Cancel

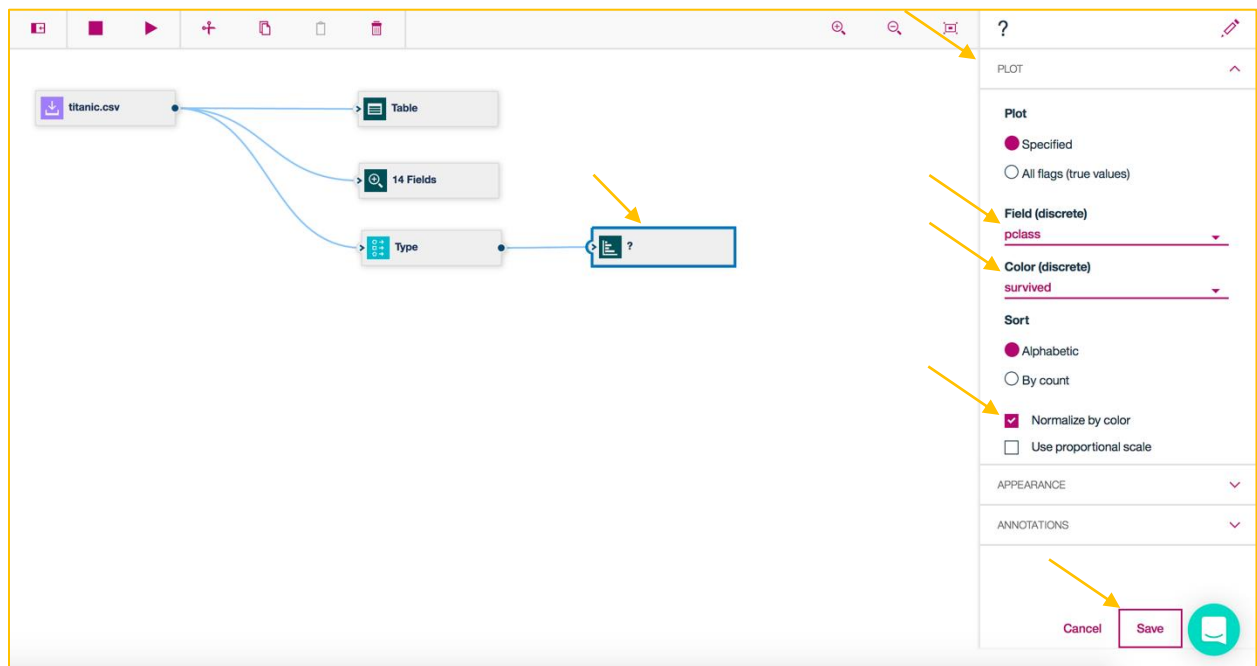
Save

Let's talk

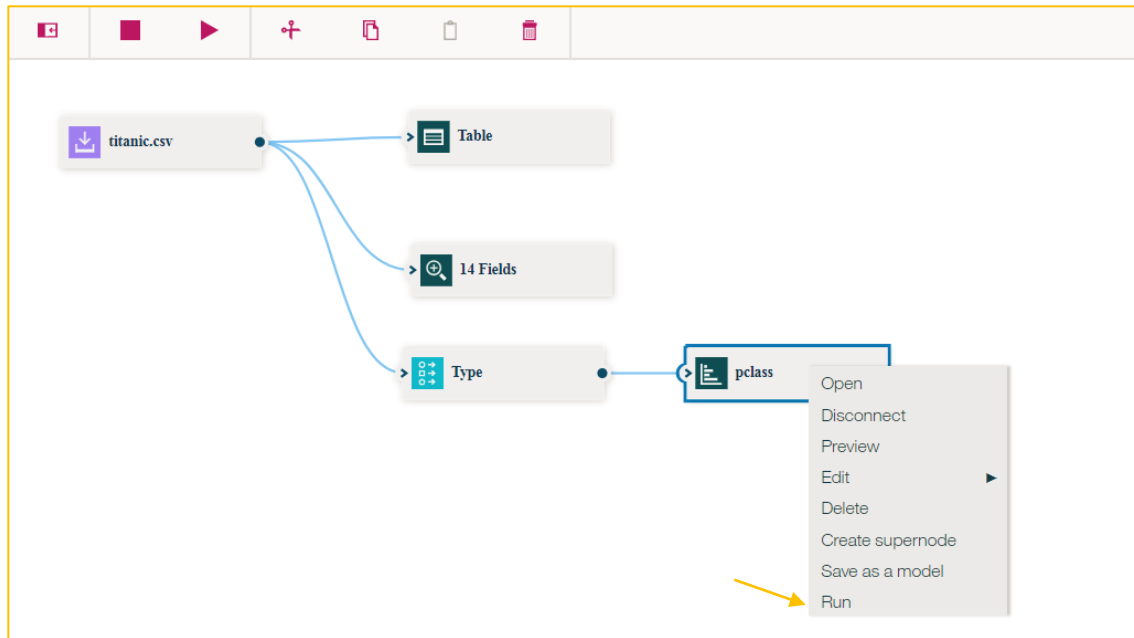
9. Add a **Distribution** node to the flow by clicking on the **Graph** menu item and then dragging the **Distribution** node to the canvas to the right of the **Type** node. If the Node Palette is not visible, click on the Node Palette icon . Connect the **Type** node to the **Distribution** node. The canvas should appear as below. The ? indicates that the fields to be plotted have not been identified.



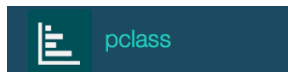
10. Double click on the Distribution Node. Click on the **Plot** dropdown. In the Field (discrete) dropdown, select **pclass**. In the Color (discrete) dropdown, select **survived**. Click on the **normalize by color** checkbox, and then click **Save**.



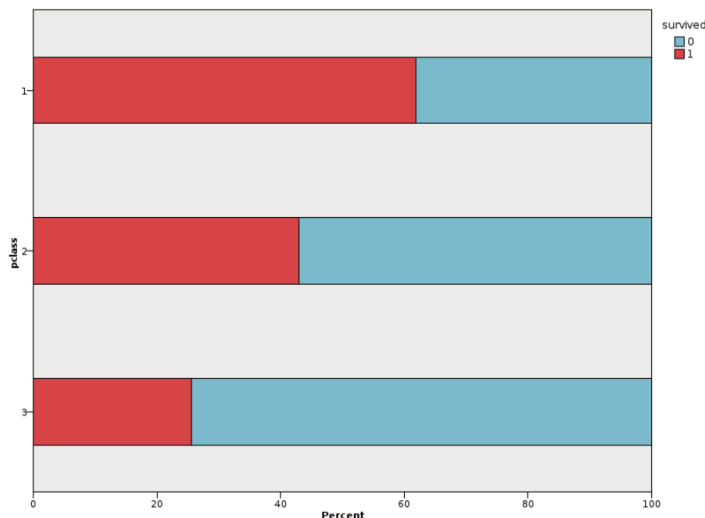
11. Right click on the Distribution node, and select Run.



12. The Distribution of pclass output will appear under the **Outputs** tab.

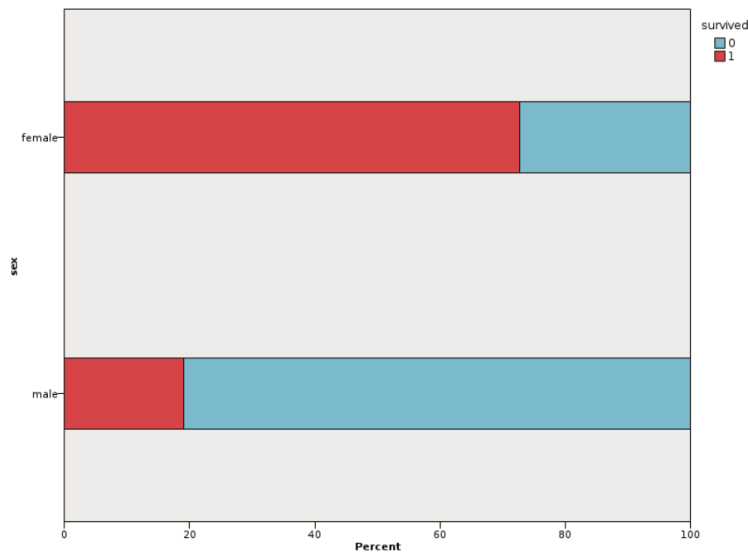



13. Double click on the **Distribution of pclass** to view the graph. We can see from the graph that the likelihood of surviving is correlated to the passenger class. The first class passengers have the highest rate of survivability. **Note if you see a graph with green bars, instead of the one below, redo Steps 10-12.**

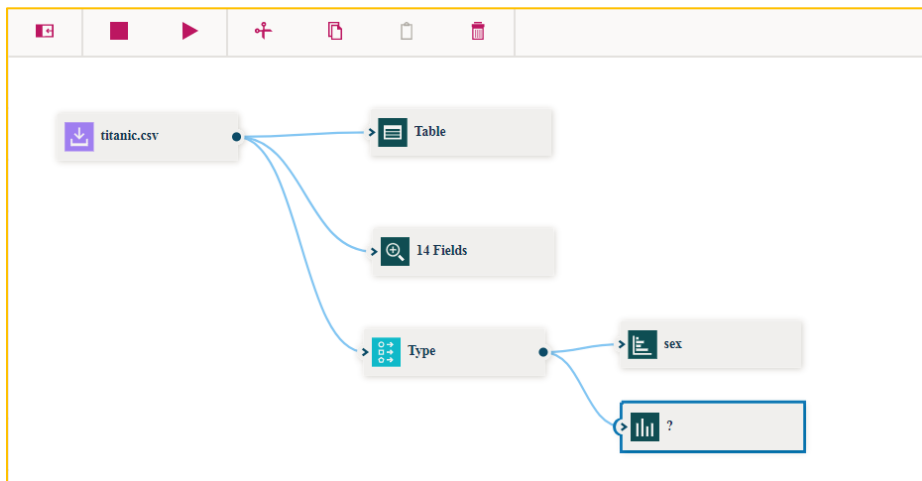


14. You can change the distribution graph to show the survivability by gender by double clicking on the Distribution node and replacing **pclass** with **sex** and clicking Save. Re-run

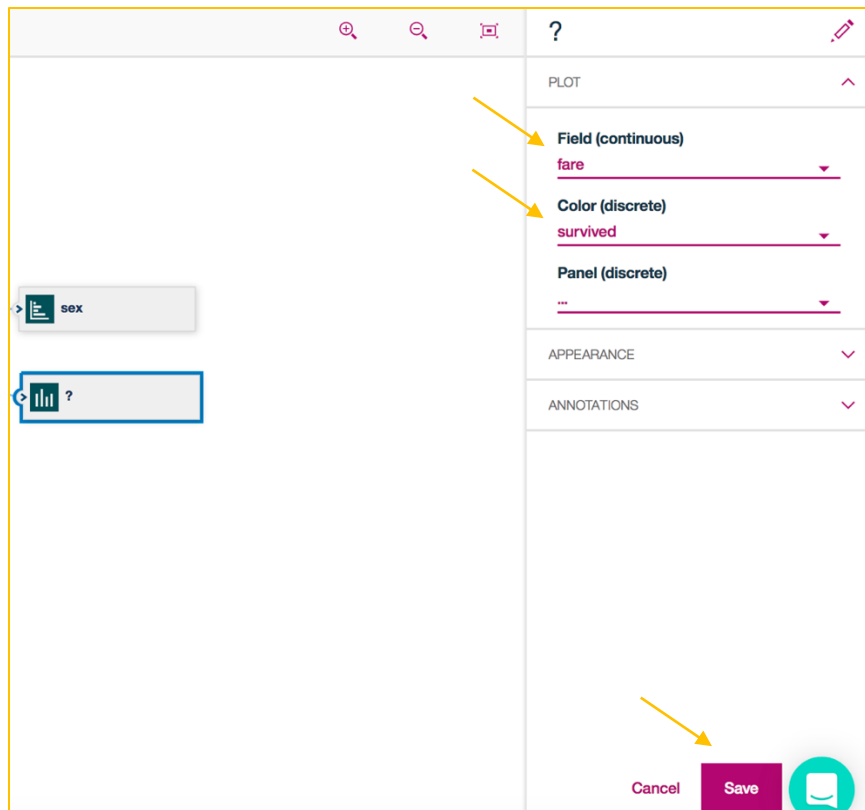
the graph by right clicking on the Distribution node and selecting Run. Double click on the **Distribution of sex** to display the graph.



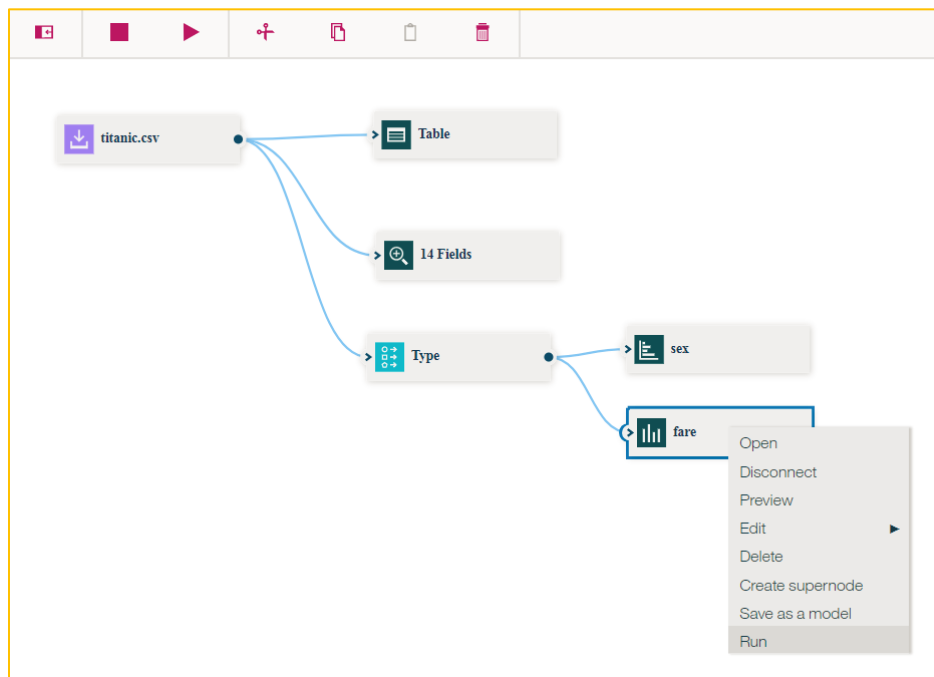
15. Add a **Histogram** node to the flow by clicking on the **Graphs** menu item and then dragging the **Histogram** node to the canvas underneath the **Distribution** node. If the Node Palette is not visible, click on the Node Palette icon . Connect the **Type** node to the **Histogram** node. The canvas should appear as below. The ? indicates that the fields to be plotted have not been identified.



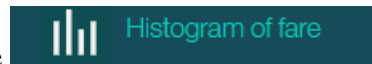
16. Double click on the **Histogram** node. Click on the **Plot** dropdown. Select **fare** from the Field (continuous) dropdown. Select **survived** from the Color (discrete) dropdown. Click on **Save**.



17. Right click on the **Histogram** node and select **Run**.

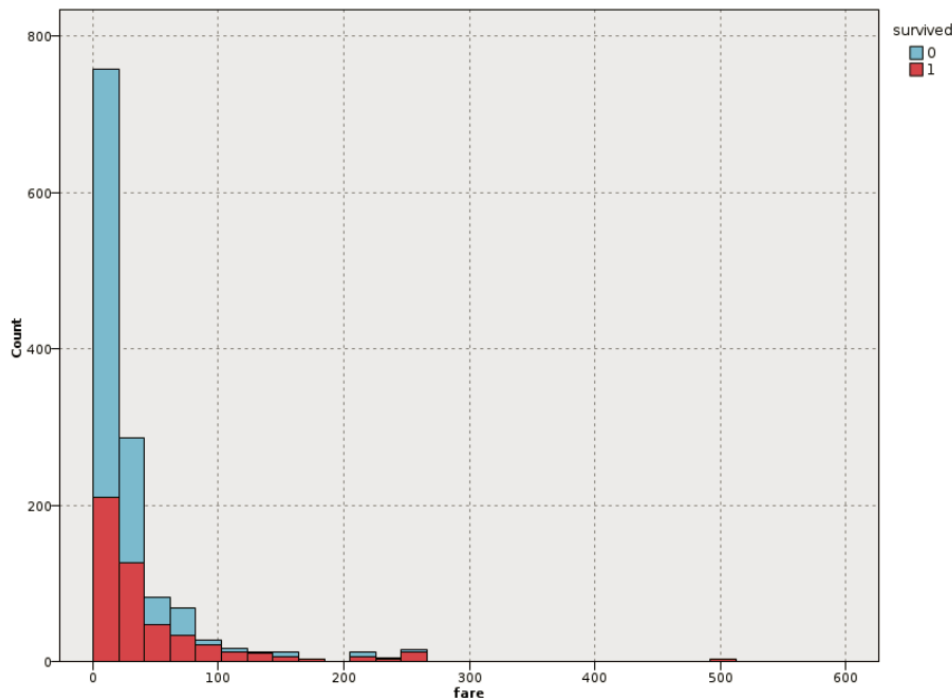


18. Double click on the Histogram of fare



under the Outputs

tab at the right of the screen.



19. We can see that the higher fares have a higher percentage of survival. We can also see that the histogram is skewed. Skewness will impact the effectiveness of some machine learning techniques. One way to deal with skewness is to do a logarithmic transformation of the data. We will do this transformation in the preparing the data for modeling section below.


Step 2.4 Prepare the Data for Modeling

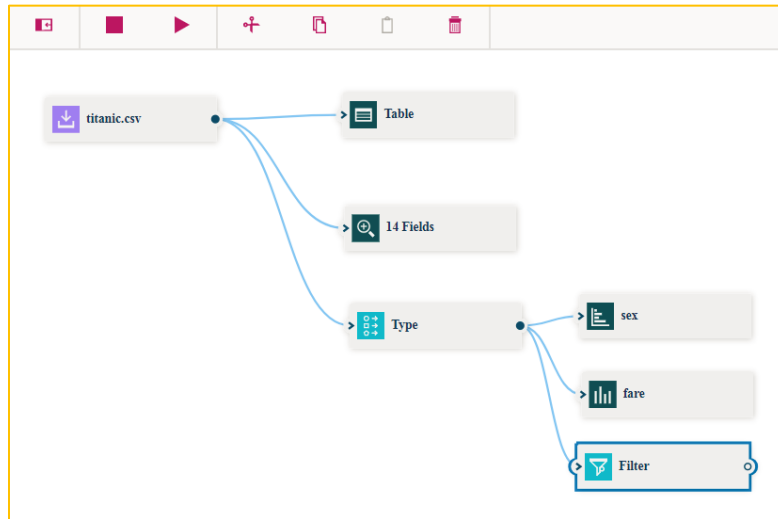
Based on our exploration of the data, there are several transformations that are needed to prepare the data for modeling. This section will introduce, the **Filter** node, the **Select** node, and the **Derive** node that will do the necessary transformations. The **Filter** and **Derive** nodes act on a field level, whereas the **Select** node acts on a record level.

Filter node – The **Filter** node performs two functions. It specifies fields that can be dropped. It also allows fields to be renamed. We will drop the fields cabin,boat,body, and home.dest.

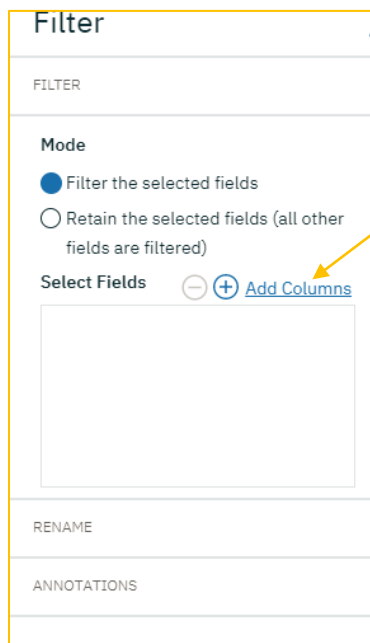
Derive node – The **Derive** node modifies data values or creates new fields from one or more existing fields. We will use the derive node to do a logarithmic transformation of the fare field. We will also use this node to bin the age and fare fields.

Select node – The **Select** node is used to select or discard a subset of records from the data stream based on a specific condition. We will remove the rows where there are missing information in the fare, age, or embarked fields.

1. Add a **Filter** node to drop fields with many missing values. Add the **Filter** node by clicking on the **Field Operations** menu item in the Node palette and dragging the **Filter** node onto the canvas underneath the fare **Histogram** node. If the Node Palette is not visible, click on the Node Palette icon  first. Connect the **Type** node to the **Filter** node. The canvas should appear as below.



2. Double click on the **Filter** node. Click on the **Filter** dropdown. In the Filter panel, click on **Add Columns**.



- Click on the checkboxes adjacent to the **cabin**, **boat**, **body**, and **home.dest** fields, and then click on **OK**.

Select Fields for Filter

Search in column Field name Filter: [Reset](#)

| <input type="checkbox"/> | Field name ^ | Data type ^ |
|-------------------------------------|--------------|-------------|
| <input type="checkbox"/> | pclass | integer |
| <input type="checkbox"/> | survived | integer |
| <input type="checkbox"/> | name | string |
| <input type="checkbox"/> | sex | string |
| <input type="checkbox"/> | age | double |
| <input type="checkbox"/> | sibsp | integer |
| <input type="checkbox"/> | parch | integer |
| <input type="checkbox"/> | ticket | string |
| <input type="checkbox"/> | fare | double |
| <input checked="" type="checkbox"/> | cabin | string |
| <input type="checkbox"/> | embarked | string |
| <input checked="" type="checkbox"/> | boat | string |
| <input checked="" type="checkbox"/> | body | integer |
| <input checked="" type="checkbox"/> | home.dest | string |

[Cancel](#) [OK](#)

- Click **Save** on the Filter panel.

Filter

FILTER

Mode

☒ Filter the selected fields

☐ Retain the selected fields (all other fields are filtered)

Select Fields [Add Columns](#)

cabin

boat


body

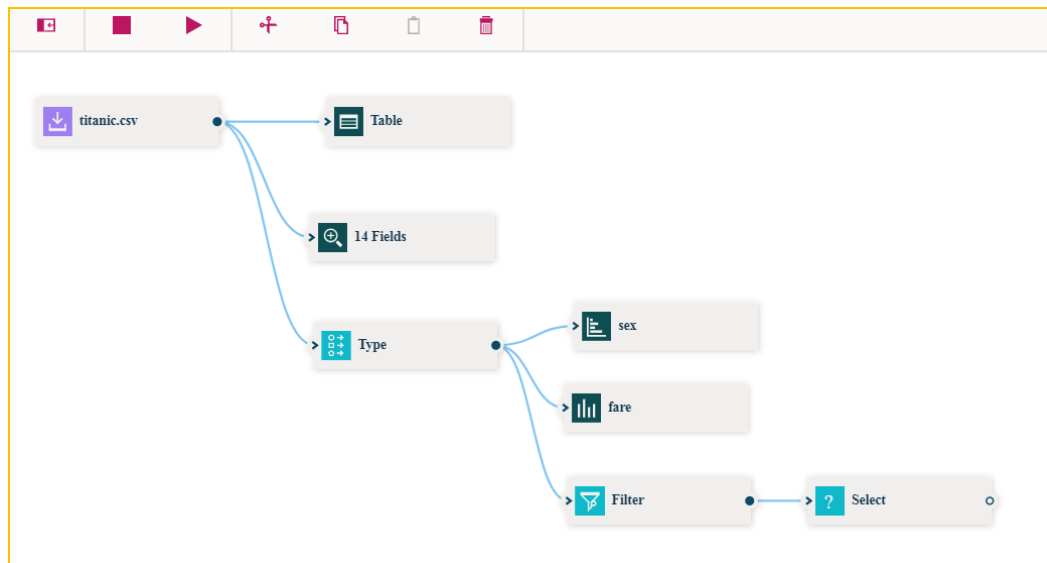
home.dest

RENAME

ANNOTATIONS

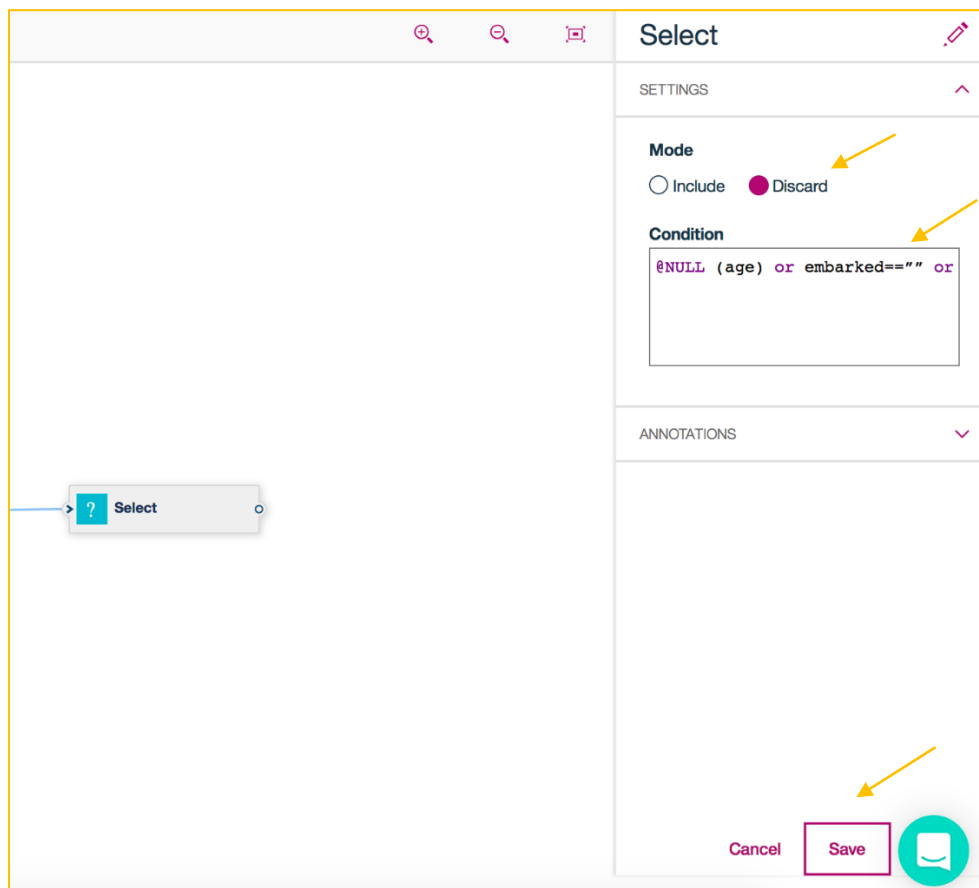
Cancel Save


5. Add a **Select** node by clicking on the **Record Operations** menu item in the Node palette, and then dragging the **Select** node to the canvas to the right of the **Filter** node. Connect the **Filter** node to the **Select** node. If the Node Palette is not visible, click on the Node Palette icon  first. The canvas should appear as below.

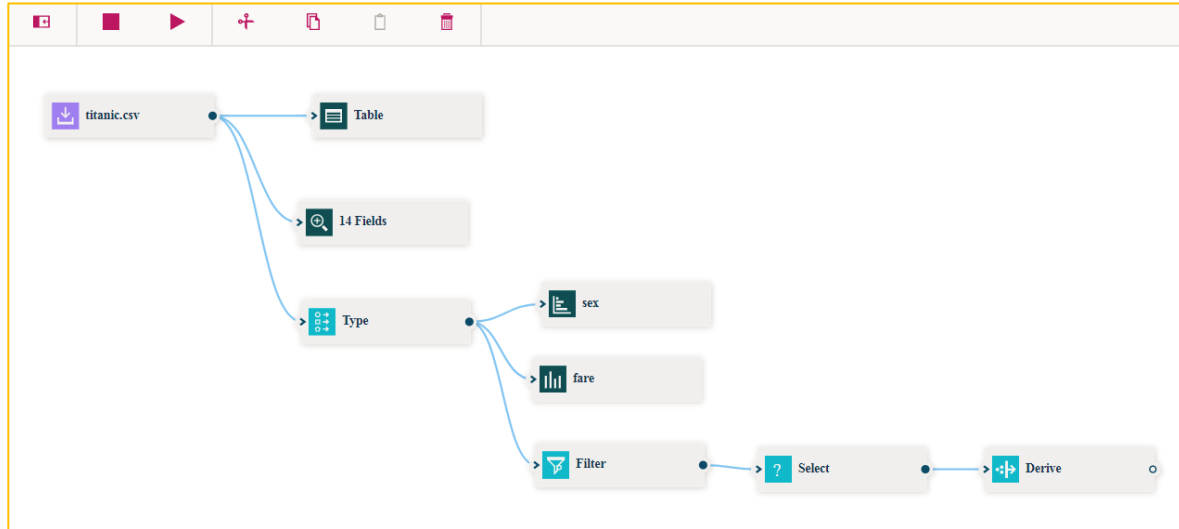


6. Double click on the **Select** node. Click on the **Settings** dropdown. In the **Select** panel, click on the **Discard** radio button, and re-type in the code shown below in the **Condition** text box, and then click **Save**.

@NULL (age) or embarked==" or @NULL(fare)



7. Add a **Derive** node to the canvas by clicking on the **Field Operations** menu item in the Node palette, and then dragging the **Derive node** onto the canvas to the right of the **Select** node. If the Node Palette is not visible, click on the Node Palette icon  first. Connect the **Select** node to the **Derive** node. The canvas should appear as below.



- Double click on the **Derive** node. Click on the **Settings** Dropdown. Click on the **Single** radio button, enter log_fare for the **Derive** field, select **Continuous** for the measurement, enter the following code in the **Expression** text box, and click Save.

```
if (fare /=0) then log(fare)
```

```
else 0
```

```
endif
```

SETTINGS

Mode

☒ Single field

☐ Multiple fields

Derived Field Name

log_fare 120

Derive As

Formula

Measurement


Continuous

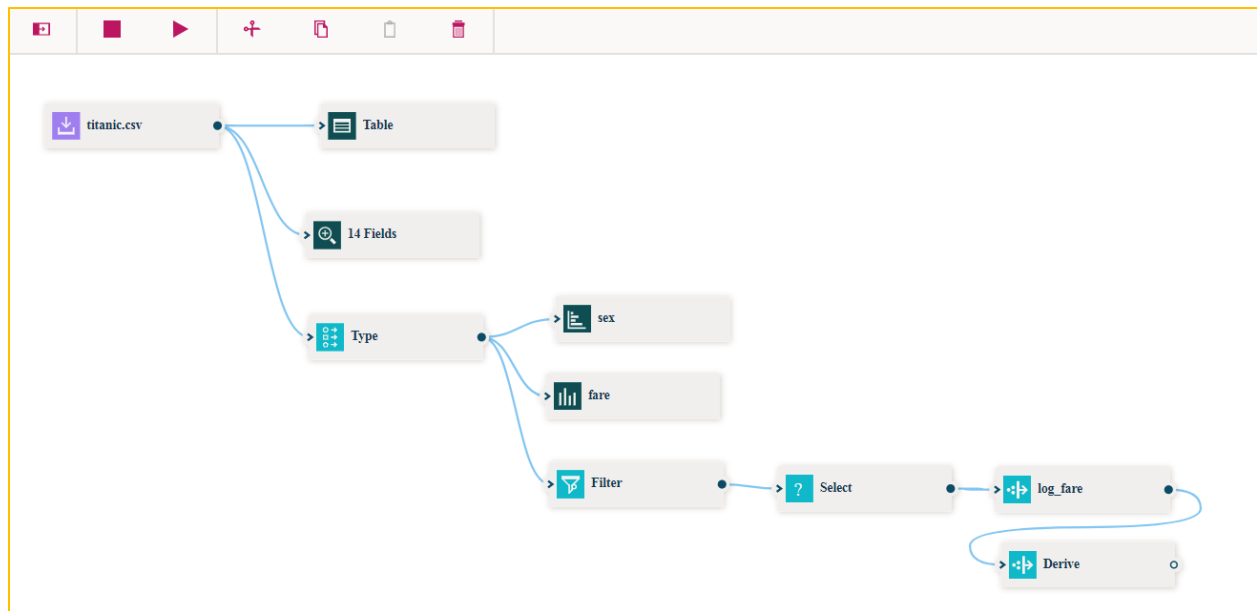
Expression

if (fare /=0) then log(fa

Cancel Save

- Binning of continuous fields is a technique sometimes used in preparing data for modeling. We will bin the age field, and the log_fare field. Add a **Derive** node by clicking on the **Field Operations** menu item in the Node palette and dragging the **Derive** node on the canvas underneath the log_fare **Derive** node.

If the Node Palette is not visible, click on the Node Palette icon  first. Connect the log_fare **Derive** node to the newly added **Derive** node. The canvas should appear as below.



10. Double click on the **Derive** node. Click on the **Settings** dropdown. Click on the **Single** radio button, enter **age_bucket** for the **Derived Field Name**, select **Ordinal** for the **Measurement**, cut and paste the following code in the **Expression** text box, and then click **Save**.

```
if age >=0 and age < 6 then 0
else if age >=6 and age < 12 then 1
else if age >=12 and age < 18 then 2
else if age >=18 and age < 40 then 3
else if age >=40 and age < 65 then 4
else if age >=65 and age < 80 then 5
else 6
endif
endif
endif
endif
endif
endif
```

Mode

☒ Single field

☐ Multiple fields

Derived Field Name

age_bucket

Derive As

Formula

Measurement

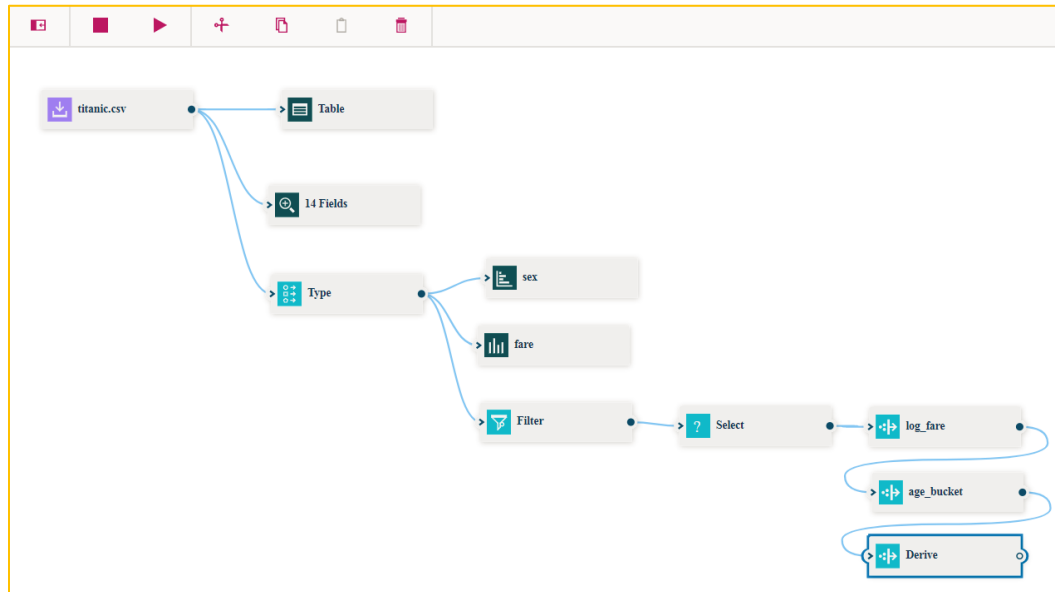
Ordinal

Expression

```
if age >=0 and age < 6
else if age >=6 and age < 12
else if age >=12 and age < 18
else if age >=18 and age < 40
else if age >=40 and age < 65
else if age >=65 and age < 80
else 6
endif
endif
endif
endif
endif
```

Cancel Save

11. Add a **Derive** node by clicking on the Field Operations menu item in the Node palette and dragging the **Derive** node onto the canvas underneath the age_bucket **Derive** node. Connect the age_bucket **Derive** node to the newly created **Derive** Node. The canvas should appear as below.



12. Double click the **Derive** node. In the **Derive** panel, click on the **Single** radio button, enter fare_bucket in the **Derived Field Name**, click on Ordinal for the **Measurement**, enter the following code in the **Expression** text box, and click on **Save**.

```
if log_fare < 0 then 0
else if log_fare > 8 then 9
else to_integer(log_fare)+1
endif
endif
```

Mode

☒ Single field

☐ Multiple fields

Derived Field Name

fare_bucket

Derive As

Formula

Measurement

Ordinal

Expression

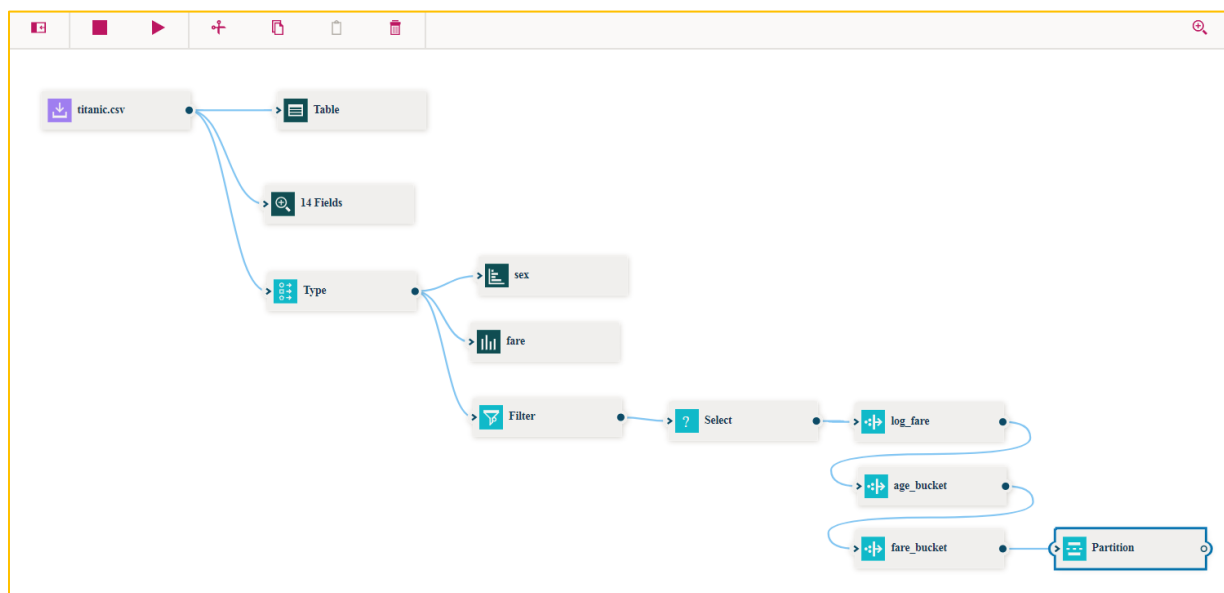
```
if log_fare < 0 then 0
else if log_fare > 8 then 9
else to_integer(log_fare)+1
endif
endif
```

Cancel Save

Step 2.5 Modeling and Evaluation

Now that the data is prepared, we can start the modeling effort. First, we will add a **Partition** node to divide the data set into Training and Testing sets. In addition, a **Type** node is needed prior to modeling to type the new data fields that were created. Then we will add a **Logistic Regression** node, and use the Training set to train the model. Finally, we will add an **Analysis** node to evaluate the results.

1. Add a **Partition** node by clicking on the Field Operations menu item in the Node palette and dragging the **Partition** node onto the canvas to the right of the fare_bucket **Derive** node. Connect the fare_bucket **Derive** node to the **Partition** node. The canvas should appear as below.



2. Double click on the Partition node. Set the **Training Partition** to 70 and the **Test Partition** to 30. Leave the other defaults, and click on **Save**.

The screenshot shows the 'Partition' node configuration panel. On the left, a 'Select' node is connected to the 'Partition' node. The 'Partition' node's settings are displayed on the right. The 'Derived Field Name' is 'Partition'. The 'Training Partition' is set to 70, and the 'Testing Partition' is set to 30. The 'Create validation partition' checkbox is unchecked, and the 'Repeatable partition assignment' checkbox is checked. The 'Seed' is 1234567, and the 'Use unique field to assign partitions' checkbox is unchecked. The 'Annotations' section is empty. At the bottom, there are 'Cancel' and 'Save' buttons, with a yellow arrow pointing to the 'Save' button. A teal chat icon is also visible in the bottom right corner.

Partition

SETTINGS

Derived Field Name
Partition

Training Partition
70

Testing Partition
30

☐ Create validation partition

☒ Repeatable partition assignment

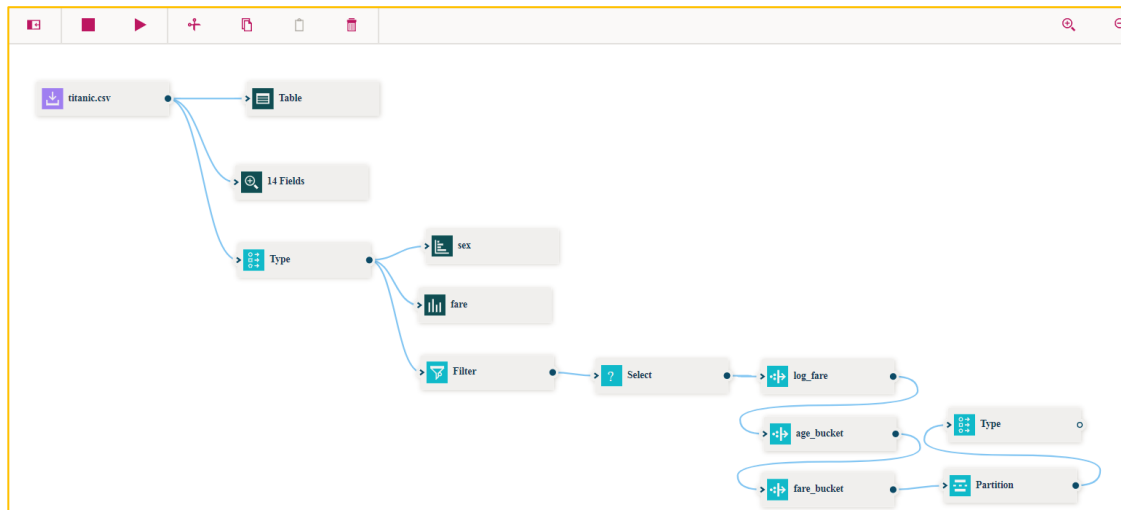
Seed [Generate](#)
1234567

☐ Use unique field to assign partitions

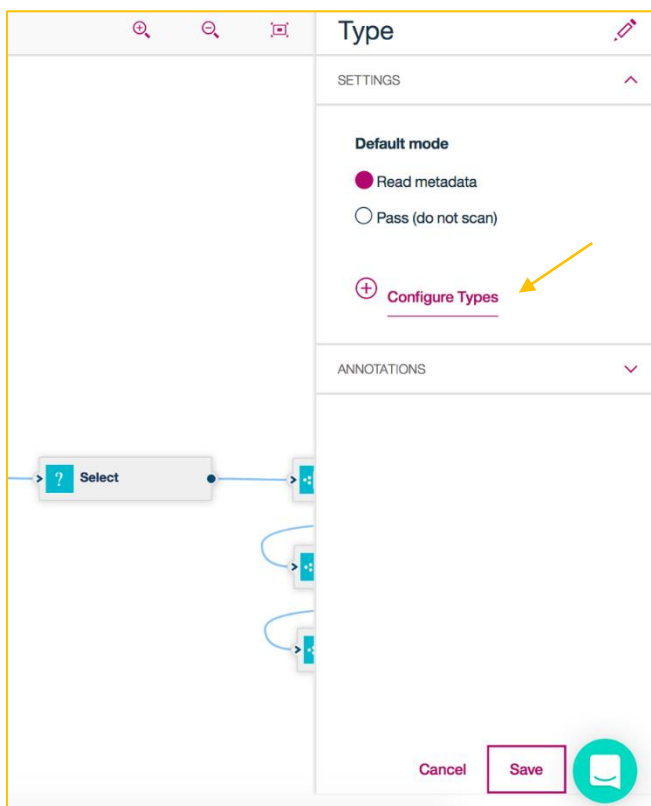
ANNOTATIONS

Cancel Save

3. Add a **Type** node by clicking on the **Field Operations** in the Node palette and dragging the **Type** node onto the canvas above the **Partition** node. Connect the **Partition** node to the **Type** node. The canvas should appear as below.



4. Double click on the **Type** node. Click on **Configure Types**.



5. Click on **Add Columns**.

Configure Types

Types

⊖ ⊕ Add Columns

| Field ^ | Measure ^ | Role ^ | Value mode ^ | Values ^ | Check ^ |
|---------|-----------|--------|--------------|----------|---------|
| | | | | | |






Cancel




















OK




- Click on checkboxes adjacent to the **log_fare**, **age_bucket**, **fare_bucket**, and **Partition** fields (You may need to scroll down). Click on **OK**.


Select Fields for Type

 Filter:    [Reset](#) 

| <input type="checkbox"/> | Field name ^ | Data type ^ |
|-------------------------------------|---|---|
| <input type="checkbox"/> | sex |  string |
| <input type="checkbox"/> | age |  double |
| <input type="checkbox"/> | sibsp |  integer |
| <input type="checkbox"/> | parch |  integer |
| <input type="checkbox"/> | ticket |  string |
| <input type="checkbox"/> | fare |  double |
| <input type="checkbox"/> | cabin |  string |
| <input type="checkbox"/> | embarked |  string |
| <input type="checkbox"/> | boat |  string |
| <input type="checkbox"/> | body |  integer |
| <input type="checkbox"/> | home.dest |  string |
| <input checked="" type="checkbox"/> |  log_fare |  double |
| <input checked="" type="checkbox"/> |  age_bucket |  integer |
| <input checked="" type="checkbox"/> |  fare_bucket |  integer |
| <input checked="" type="checkbox"/> |  Partition |  string |

[Cancel](#) 

OK



7. For the **Partition** field, select **Ordinal** for the **Measurement**. For the **log_fare**, select **Continuous** for the **Measurement**. For the **fare_bucket** field, select **Ordinal** for the **Measurement**, and for the **age_bucket**, select **Ordinal** for the **Measurement**, and click **OK**.

Configure Types

Read Values

Types

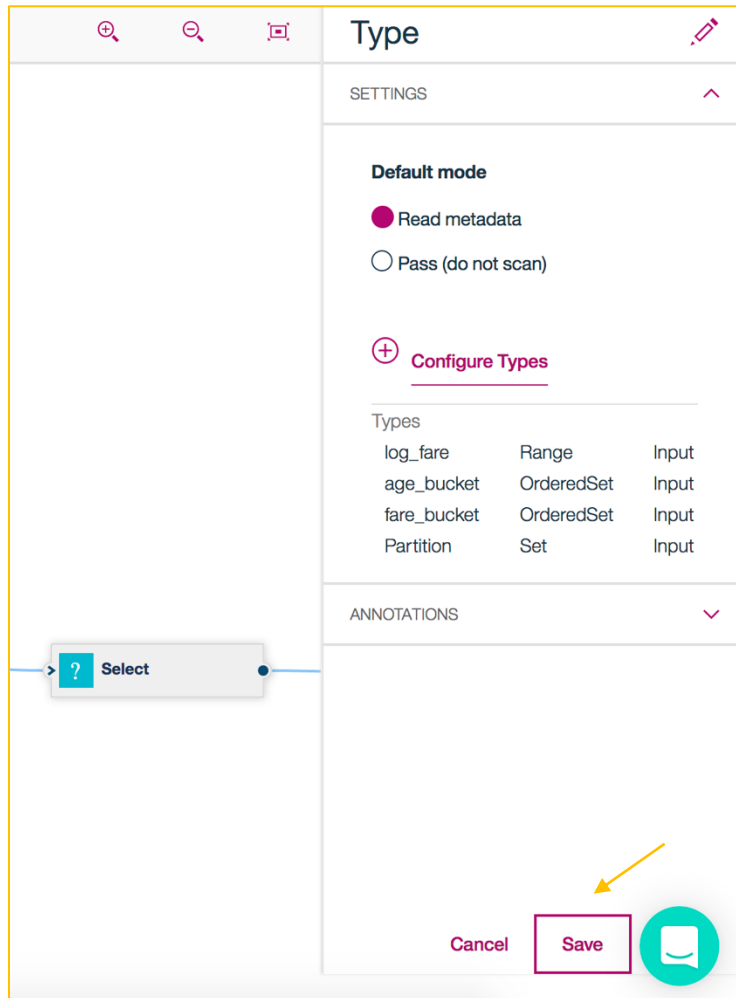
Add Columns

| Field^ | Measure^ | Role^ | Value mode^ | Values^ | Check^ |
|-------------|------------|-------|-------------|----------------|--------|
| Partition | Ordinal | Input | Specify | 1_Trainin... | None |
| log_fare | Continuous | Input | Specify | 0.0, 6.23... | None |
| fare_bucket | Ordinal | Input | Specify | 1, 2, 3, 4,... | None |
| age_bucket | Ordinal | Input | Specify | 0, 1, 2, 3,... | None |

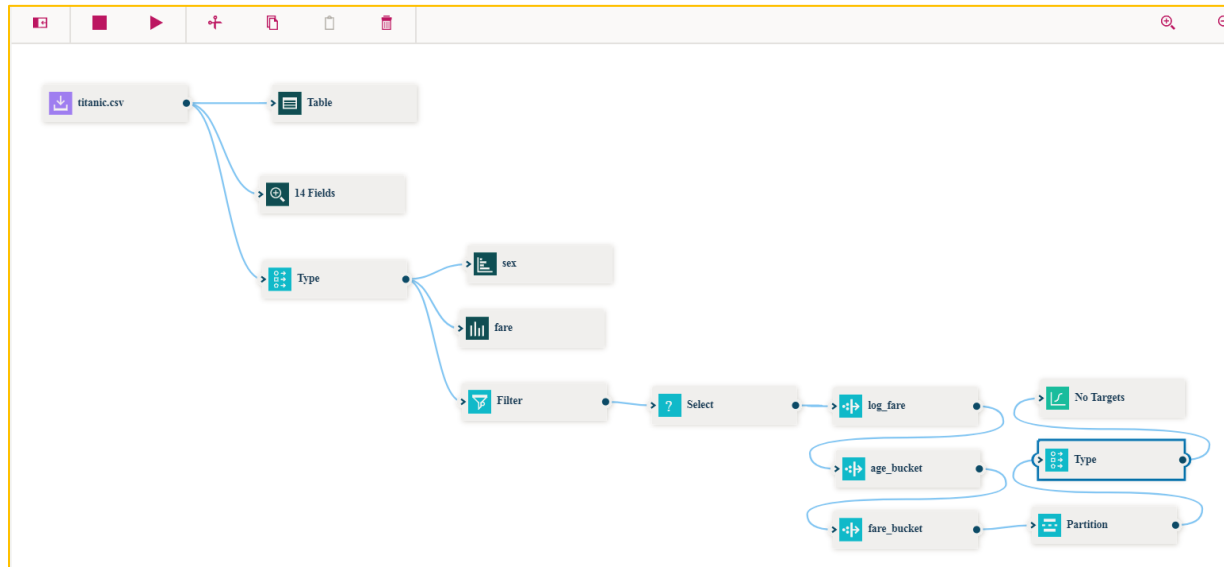
Cancel

OK

8. Click on **Save**



9. Add a **Logistic Regression** node by clicking on the **Modeling** menu item in the Node palette and dragging the **Logistic** node onto the canvas above the **Type** node. Connect the **Type** node to the **Logistic Regression** node. The canvas should appear as below.



10. Double click on the **Logistic Regression** node. Click on the checkbox next to **Use custom field roles**, select **survived** for the **Target**, select **Partition** for the **Partition**, and click on **Add Columns** to add the input fields.

The screenshot shows a configuration window titled "No Targets" for a Logistic Regression node. The window is divided into two main sections: "FIELDS" and "ANNOTATIONS".

FIELDS Section:

- ☒ Use custom field roles
- Target:** survived
- Inputs:** (Empty list with a minus icon and a plus icon labeled "Add Columns")
- Partition:** Partition

ANNOTATIONS Section:




(Empty list)


Bottom Buttons: Cancel, Save, and a chat icon.













11. Click on the checkboxes next to **pclass**, **sex**, **sibsp**, **parch**, **embarked**, **age_bucket**, **fare_bucket** fields (you have to scroll down), and then click **OK**

Select Fields for No Targets

Search in column Field name


Filter:   

Reset 

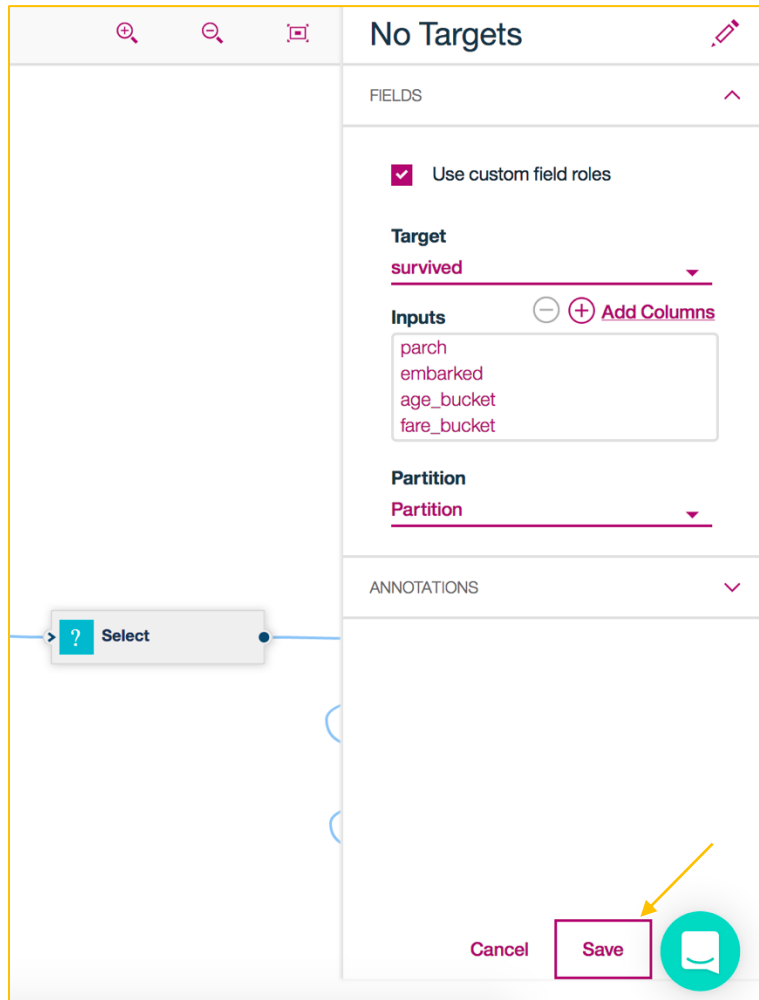
| <input type="checkbox"/> | Field name ^ | Data type ^ |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | pclass |  integer |
| <input type="checkbox"/> | name |  string |
| <input checked="" type="checkbox"/> | sex |  string |
| <input type="checkbox"/> | age |  double |
| <input checked="" type="checkbox"/> | sibsp |  integer |
| <input checked="" type="checkbox"/> | parch |  integer |
| <input type="checkbox"/> | ticket |  string |
| <input type="checkbox"/> | fare |  double |
| <input checked="" type="checkbox"/> | embarked |  string |
| <input type="checkbox"/> | log_fare |  double |
| <input checked="" type="checkbox"/> | age_bucket |  integer |
| <input checked="" type="checkbox"/> | fare_bucket |  integer |

Cancel

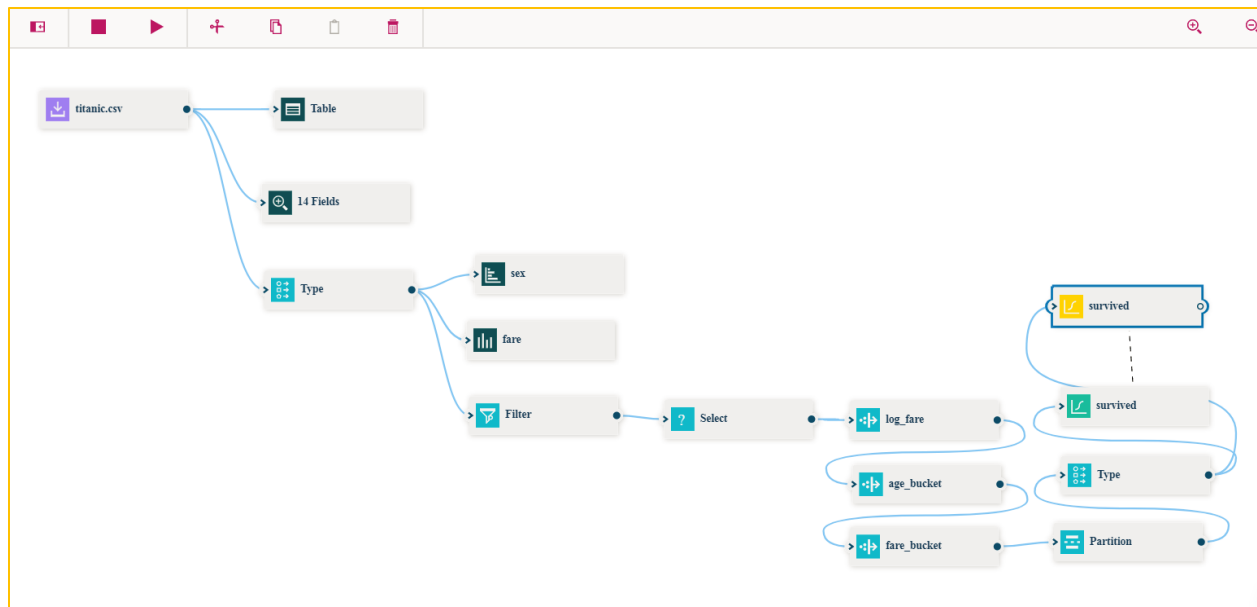
OK



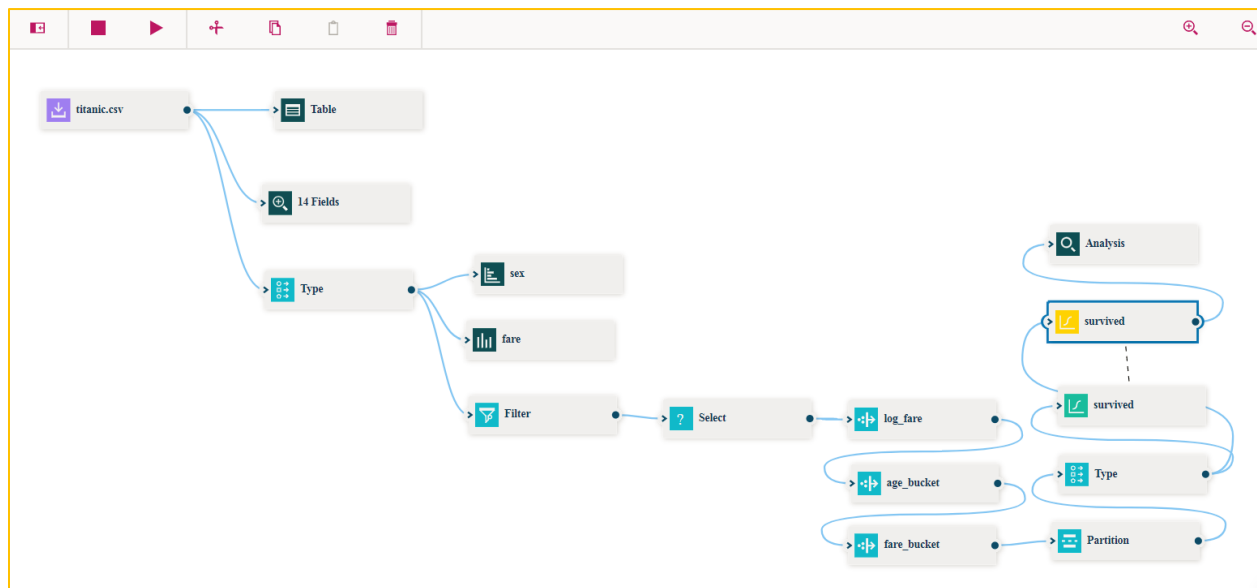
12. Click **Save**.



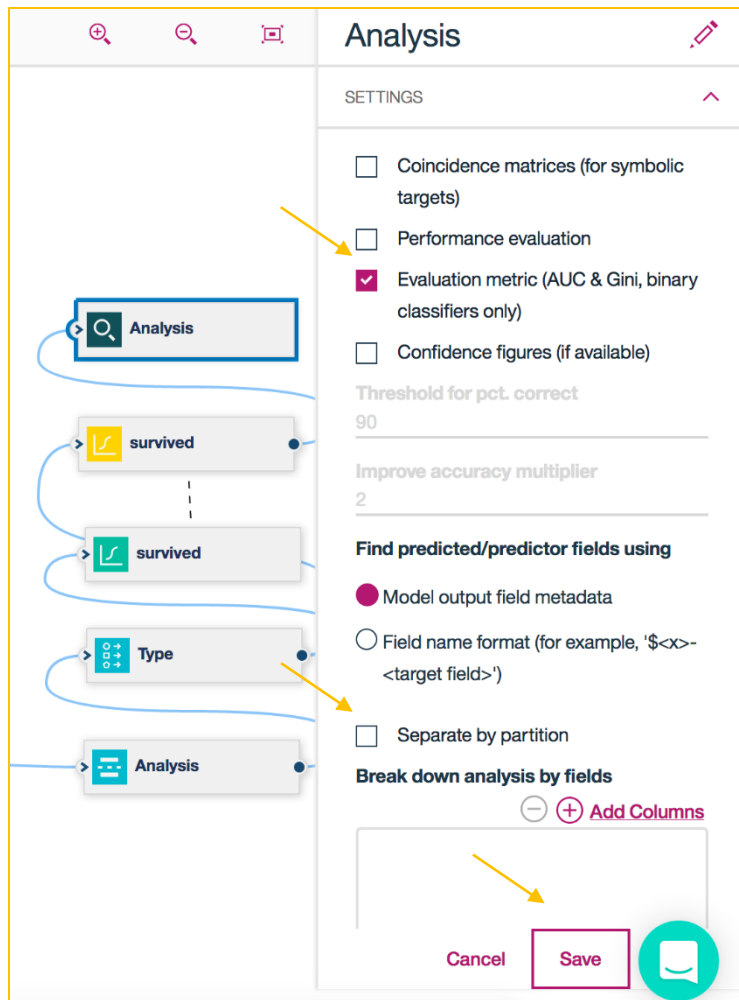
13. Right click on the **Logistic Regression** node and then click **Run**. A **Logistic Regression** “nugget will be created” connected by a dotted line to the **Logistic Regression** node. Drag the nugget and place it above the **Logistic Regression** node. The canvas should appear as below.

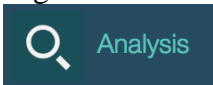


14. Add an **Analysis** node by clicking on the **Outputs** menu item in the Node palette and dragging the **Analysis** node onto the canvas above the nugget icon. Connect the nugget icon to the **Analysis** node. The canvas should appear as below.



15. Double click on the Analysis node. Click on the **Settings** dropdown. Click on the **Evaluation metric** checkbox, uncheck **Separate by partition**, and click on **Save**.



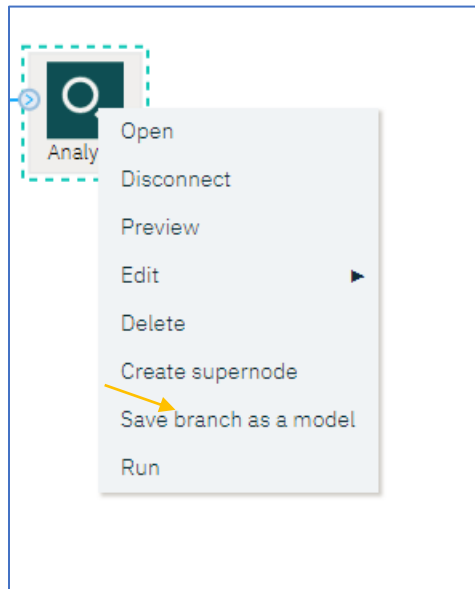
16. Right click on the Analysis node and select Run. After completion, double click on the  link in the Outputs tab on the right side of the screen. The results should be similar to those shown below.

| Results for output field survived | | |
|--------------------------------------|-------|--------|
| Individual Models | | |
| Comparing \$L-survived with survived | | |
| Correct | 828 | 79.39% |
| Wrong | 215 | 20.61% |
| Total | 1,043 | |
| Evaluation Metrics | | |
| Model | AUC | Gini |
| \$L-survived | 0.857 | 0.714 |

Step 2.6 Saving a Model

Now that we have created and evaluated a model, we will save the model as an asset. This saved model can be deployed at a future date, removing the need to recreate the same model from scratch.

1. Right click on the Analysis node and then click on **Save branch as a model**.



2. Type in “**TitanicSPSS**” as the Model Name and click **Save**.

IBM Data Science Experience | Projects Tools Community Services US South

My Projects / Titanic-SPSS-Lab / Titanic-Flow / Save

Save Model

Terminal node
Analysis

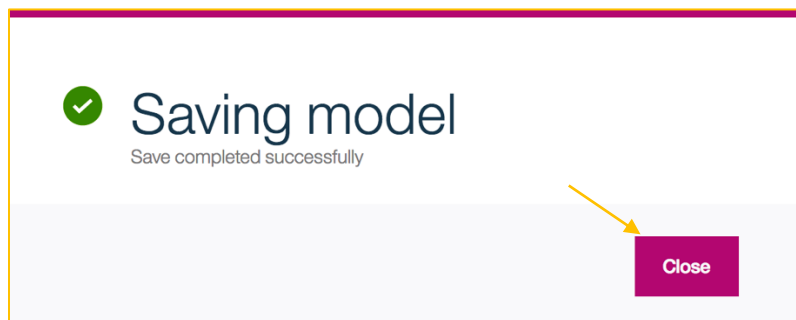
Model Name
TitanicSPSS

Machine Learning Service
predictive-modeling-fj

The model will be saved to your DSX project. You can access your model and create deployment jobs from the Models section of Analytic Assets.

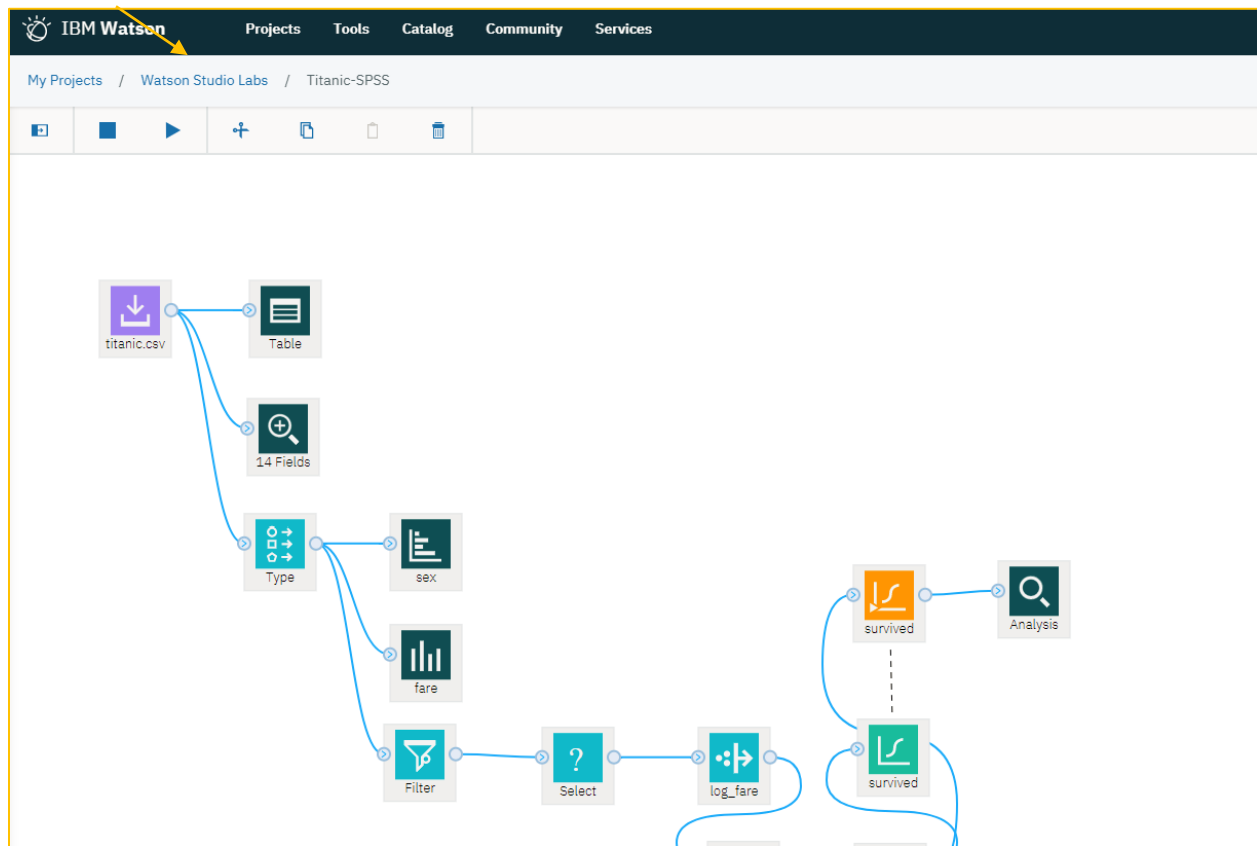
Cancel Save

3. Click **Close**.



4. Navigate to your project “assets” page. In this example, click on **Watson Studio Labs**.

*



5. Note that the model you built is now saved as an asset and the work you have completed can be easily reused in the future.

The screenshot shows the IBM Data Science Experience interface for a project named 'Titanic-SPSS-Lab'. The 'Models' section is expanded, showing a table of models.

| NAME | STATUS | TYPE | RUNTIME | LAST MODIFIED | ACTIONS |
|-------------|---------|-------------------|-------------------|---------------|---------|
| TitanicSPSS | trained | spss-modeler-18.1 | spss-modeler-18.1 | 13 Feb 2018 | ⋮ |