

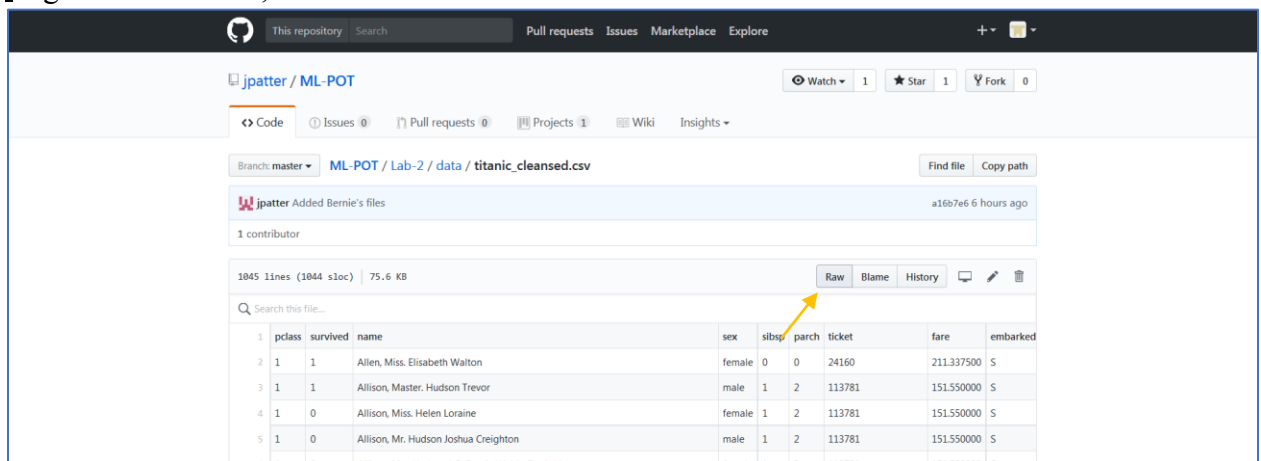
Watson Studio SPSS Modeler Overview

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. Download the Titanic data file by clicking on the link [Titanic Data Set](#) and following the instructions below.

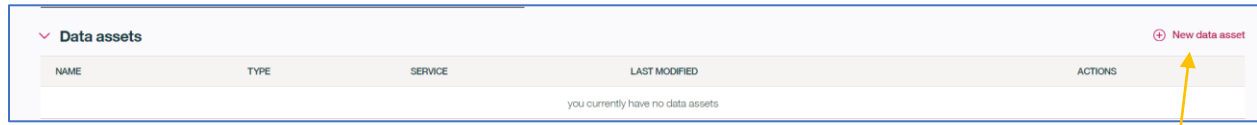
Right click on Raw, and click on Save link as



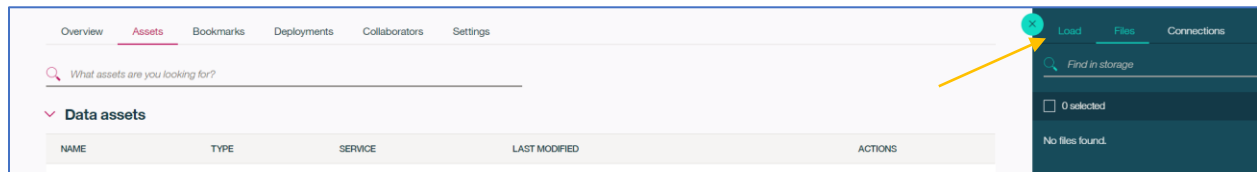
The screenshot shows the GitHub interface for the repository 'jpatter / ML-POT'. The file 'titanic_cleansed.csv' is selected, showing its commit history and file details. The file is 1045 lines (1044 sloc) and 75.6 KB. The 'Raw' button is highlighted with a yellow arrow.

1	pclass	survived	name	sex	sibsp	parch	ticket	fare	embarked
2	1	1	Allen, Miss. Elisabeth Walton	female	0	0	24160	211.337500	S
3	1	1	Allison, Master. Hudson Trevor	male	1	2	113781	151.550000	S
4	1	0	Allison, Miss. Helen Loraine	female	1	2	113781	151.550000	S
5	1	0	Allison, Mr. Hudson Joshua Creighton	male	1	2	113781	151.550000	S

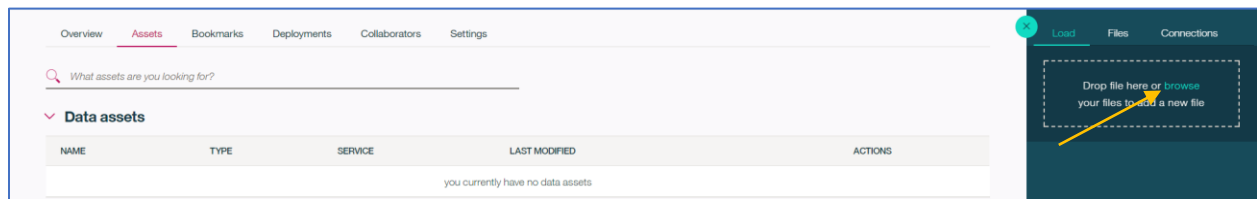
- Go back to the Watson Studio project. Click on **New data asset**, or if you don't see **New data asset**, click on the  icon.



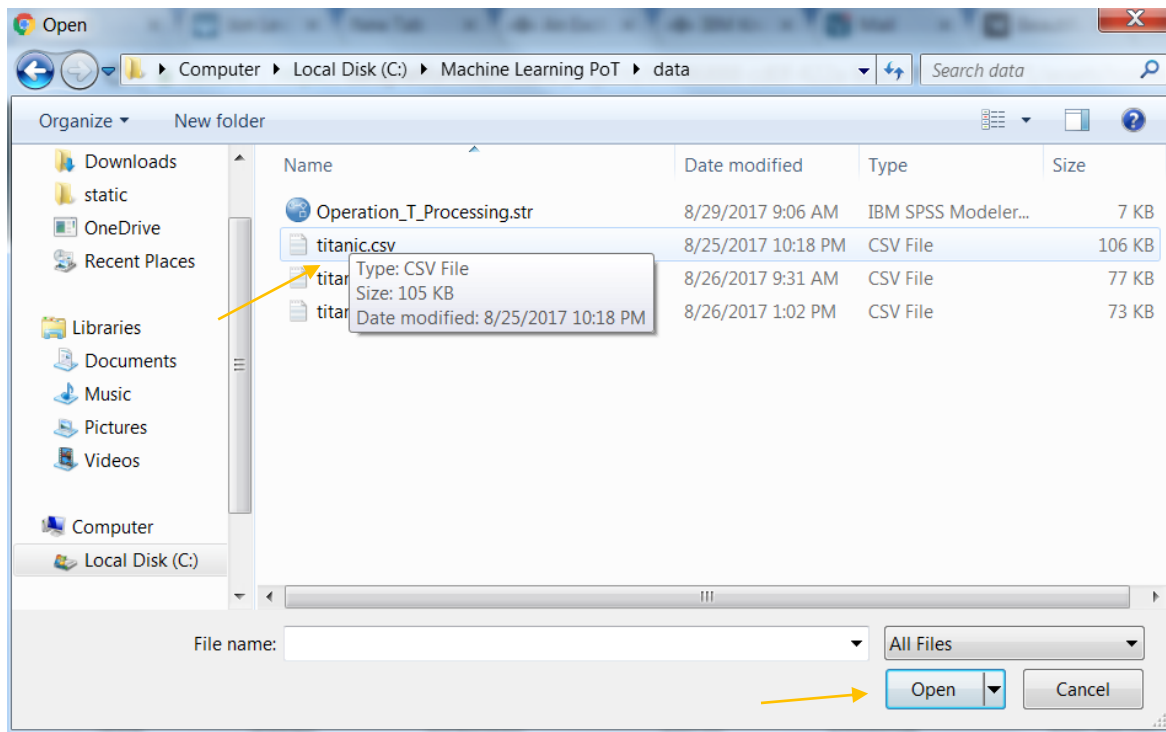
- Click on the **Load** tab.



- Click on **browse**.



- 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.

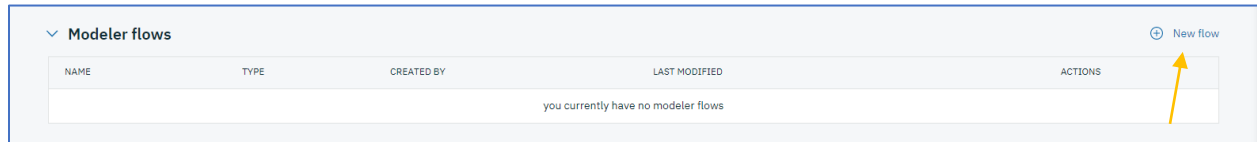
Data assets						New data asset
0 assets selected.						
<input type="checkbox"/>	NAME	TYPE	SERVICE	CREATED BY	LAST MODIFIED	ACTIONS
<input checked="" type="checkbox"/>	titanic.csv	Data Asset	Project	Michael	7 Feb 2018, 5:01:18 pm	⋮

Step 2: Create a Model to predict survival

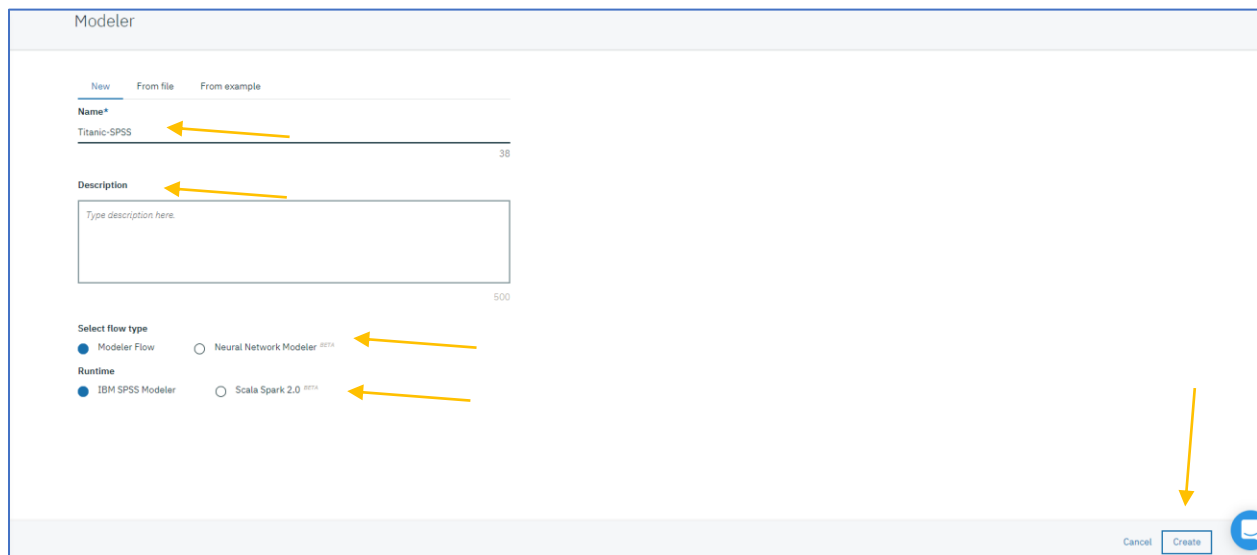
In this section, we will create a Machine Learning flow using SPSS nodes. Documentation describing the nodes is available at <https://dataplatform.ibm.com/docs/content/analyze-data/ml-canvas-spss.html?context=analytics>.

Step 2.1 Create a New Flow and Load the Data

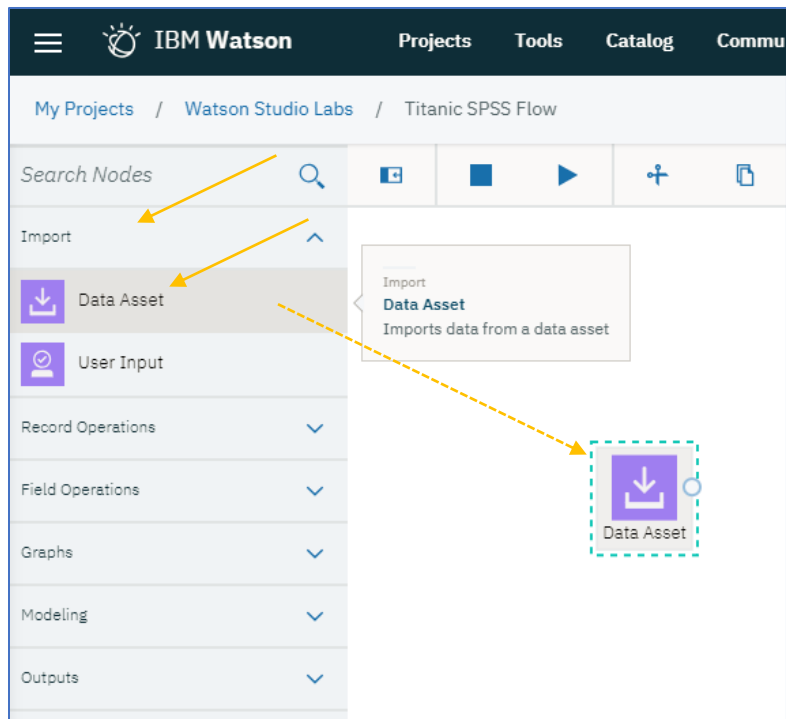
1. In the Watson Studio project, click on **New flow** in the **Modeler flows** section.



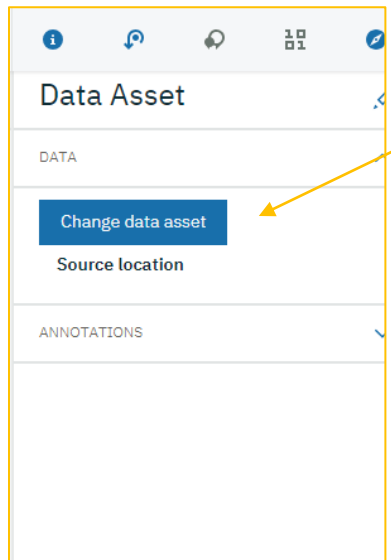
2. Enter a **Name** for the flow, optionally enter a **Description**, click on Modeler Flow for the **flow type** (should be the default), click on IBM SPSS Modeler for the **Runtime** (should be the default), and click on **Create**.



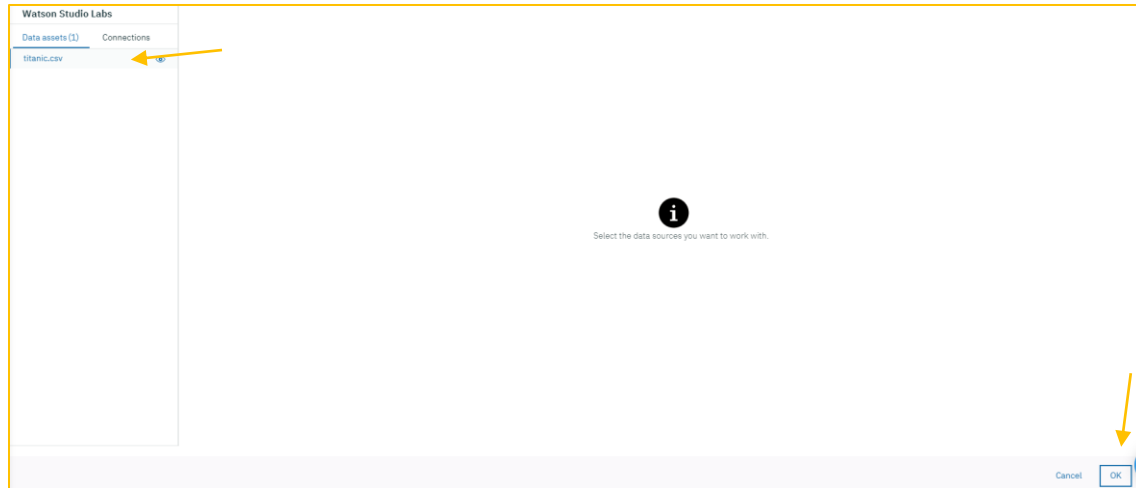
3. This opens the Flow Editor. Click on **Import** and then **Data Asset** and hold the left mouse key on the Data Asset icon and **drag it onto the left side of the canvas**. Release the left mouse key.



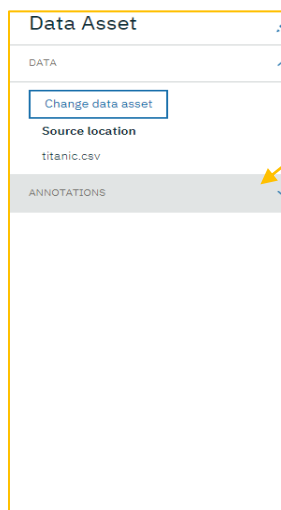
4. Double click on the **Data Asset**. In the window pane on the right-hand-side click on **Change data asset**.



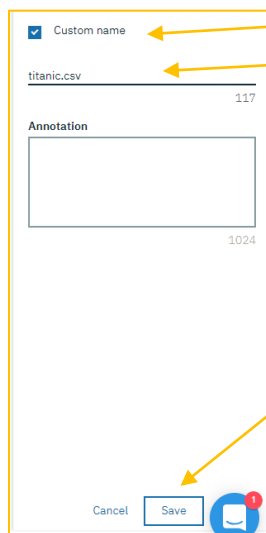
5. Select the **titanic.csv** option, and click **OK**.



6. Click on **Annotation**.

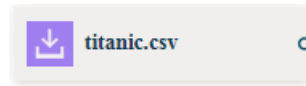


7. Click on **Custom name**, and type **titanic.csv**, and click on **Save**.

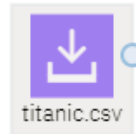



8. Note, the depiction of the flow nodes in the user interface has slightly changed from what is shown in this document. The text in the UI is now below the icon, instead of to the right.

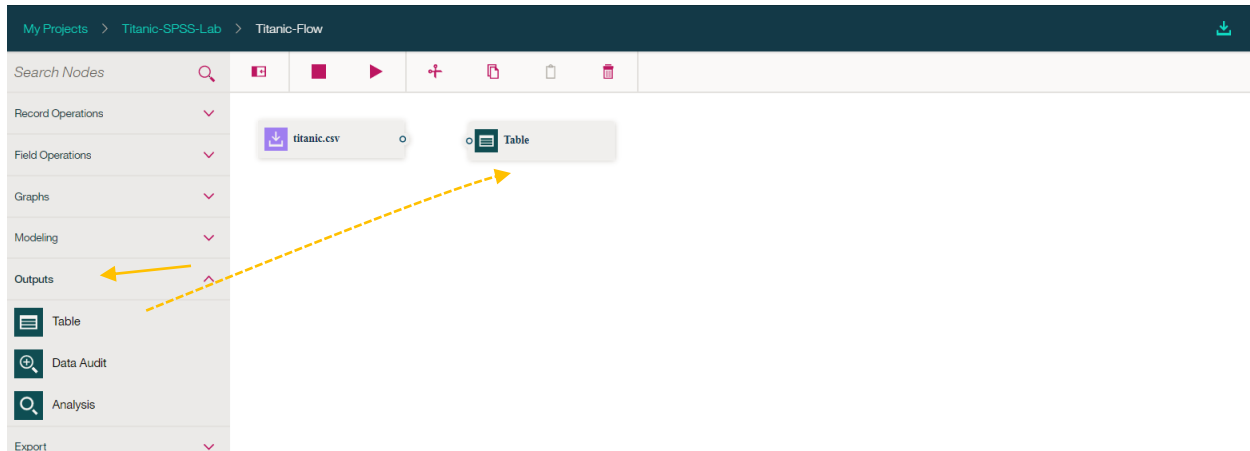
Old icon --



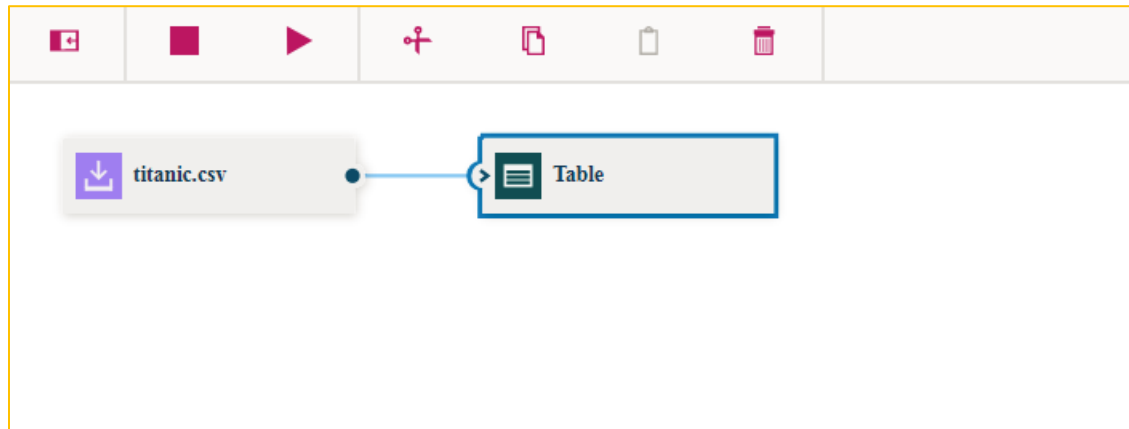
New icon-



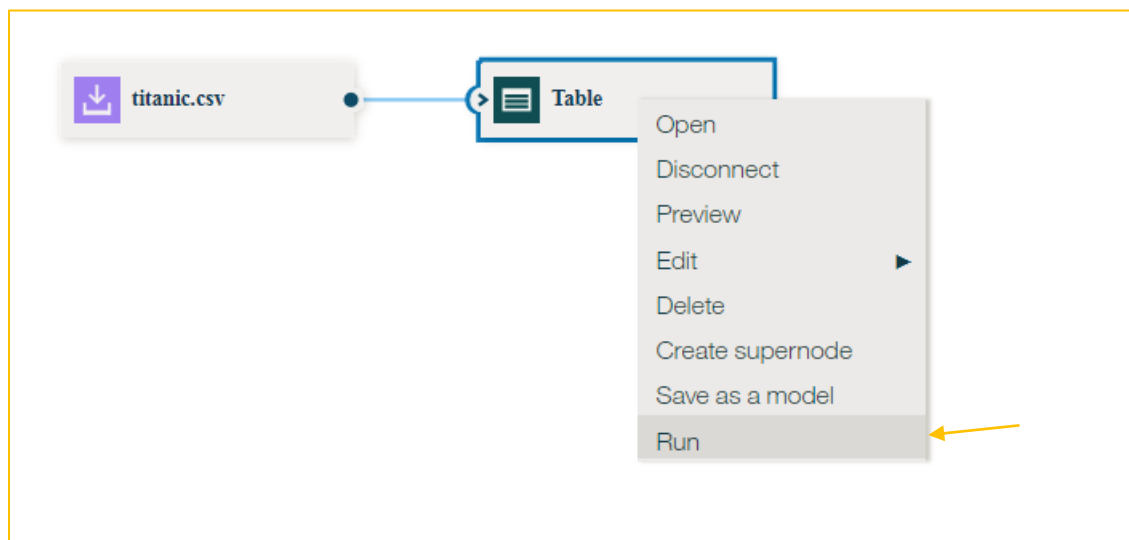
9. Click on the **Outputs** menu item in the Node Palette on the left and then click on the **Table** icon and drag the icon to the right of the titanic.csv icon. The SPSS Table node will display the contents of the csv file. If the Node Palette is not visible, click on the Node Palette icon 




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.

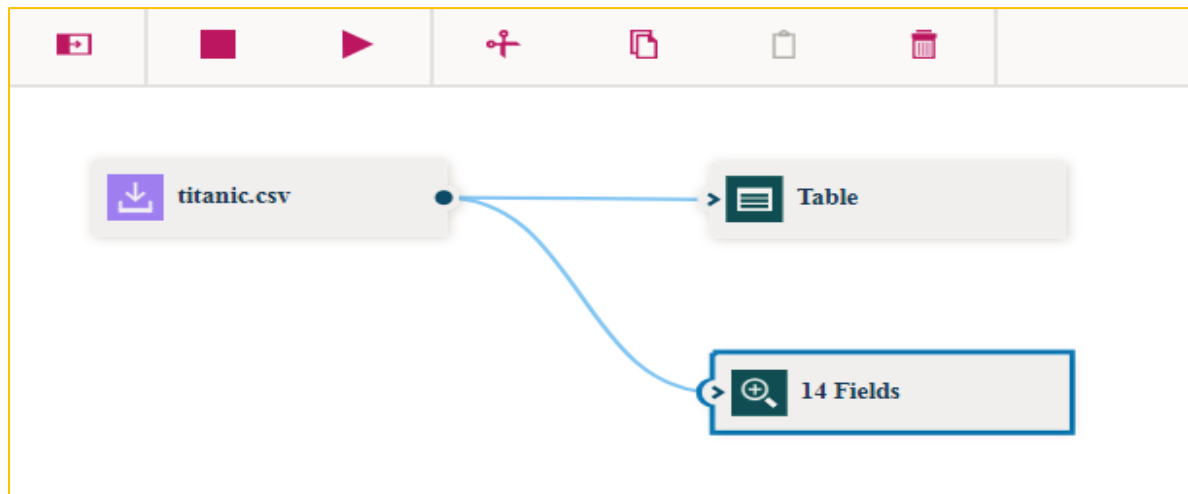
PCLASS	SURVIVED	NAME	SEX	AGE	SIBSP	PARCH	TICKET	FARE	CABIN	EMBARKED	BOAT
1	1	Allen, Miss. Elisabeth	female	29	0	0	24160	211.3375	B5	S	2
1	1	Allison, Master. Huds	male	0.9167	1	2	113781	151.55	C22 C26	S	11
1	0	Allison, Miss. Helen L	female	2	1	2	113781	151.55	C22 C26	S	
1	0	Allison, Mr. Hudson J	male	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	10952	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	11789	51.4792	C101	S	D
1	0	Artagaveytia, Mr. Ra	male	71	0	0	PC 17609	49.5042		C	
1	0	Astor, Col. John Jacc	male	47	1	0	PC 17757	227.525	C62 C64	C	
1	1	Astor, Mrs. John Jac	female	18	1	0	PC 17757	227.525	C62 C64	C	4
1	1	Aubart, Mme. Leonti	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	B

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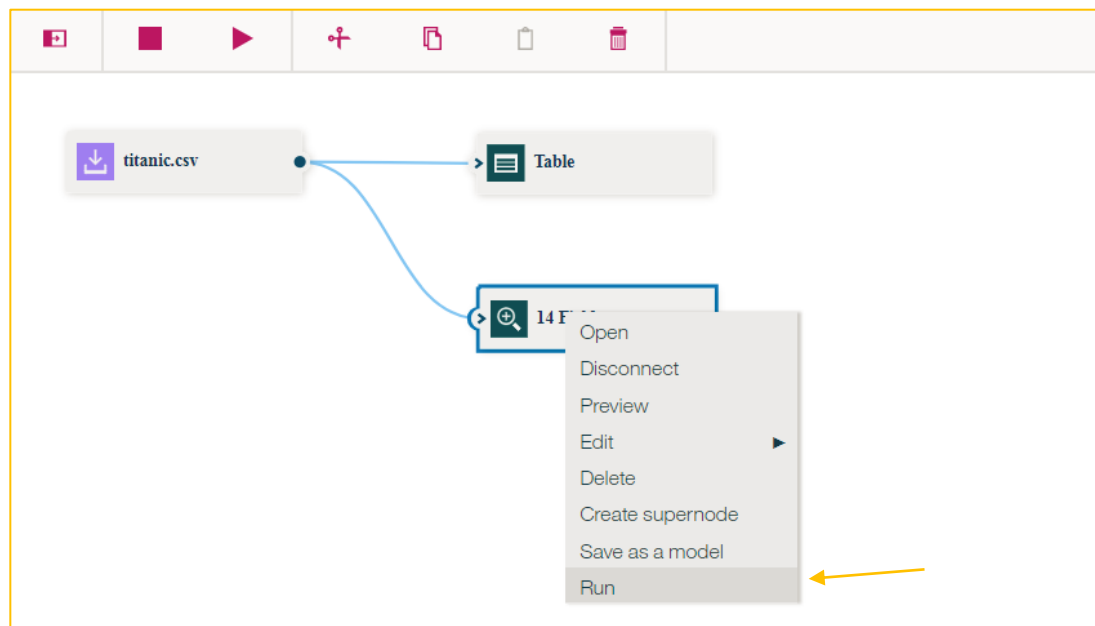
Step 2.2 Explore the Data using the Data Audit Node


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.

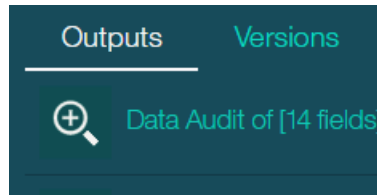
1. Add a **Data Audit** node to the flow clicking on the **Outputs** menu item in the Node Palette, and then dragging the **Data Audit** node to underneath the titanic.csv node. If the Node Palette is not visible, click on the Node Palette icon . Connect the titanic.csv node to the Data Audit node. The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







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



- 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.



- 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.

IBM Data Science Experience | Projects | Tools | Data Services | Community | US South |    

My Projects > Titanic-SPSS-Lab > Titanic-Flow > Data Audit of [14 fields] #8

Data Audit of [14 fields] #8


	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	--	--	--	--	--	--	745

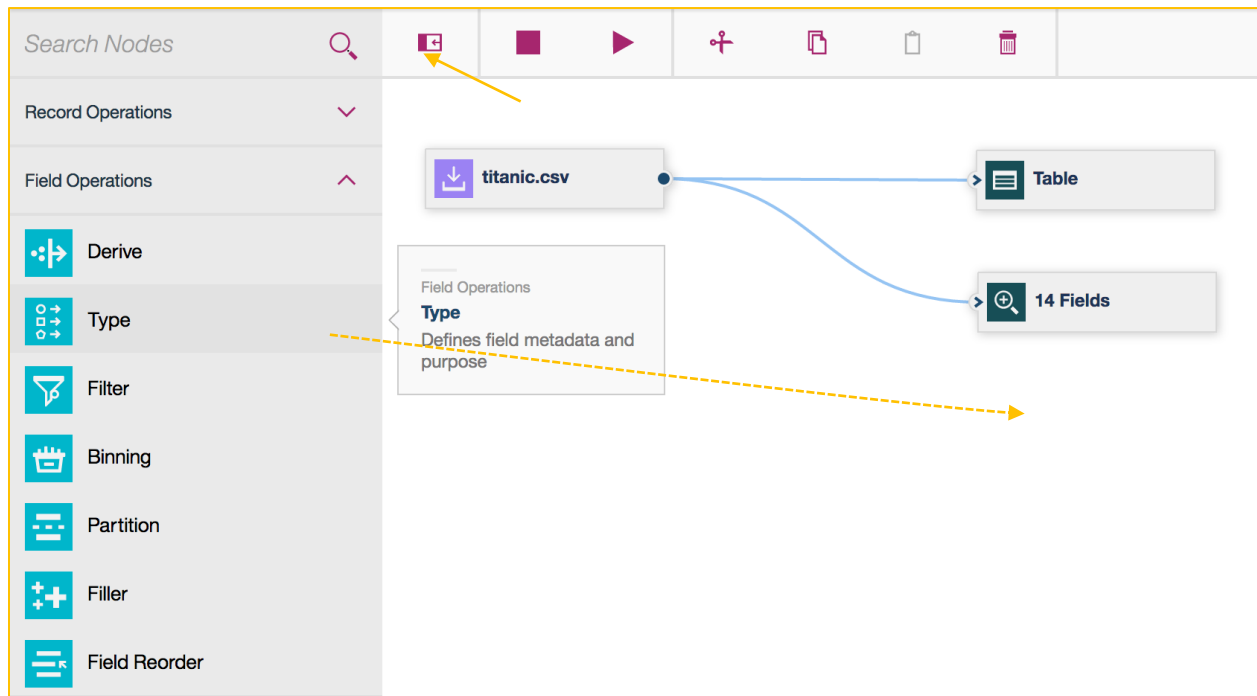
	Field	Measurement	Outliers	Extremes	Action	Impute Missing	Method	% Complete	Valid Records	Null Value	Empty String	White Space	Blank Value
1	pclass	Continuous	0	0	None	Never	Fixed	100.000	1309	0	0	0	0
2	survived	Continuous	0	0	None	Never	Fixed	100.000	1309	0	0	0	0
3	name	Categorical	--	--	--	Never	Fixed	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

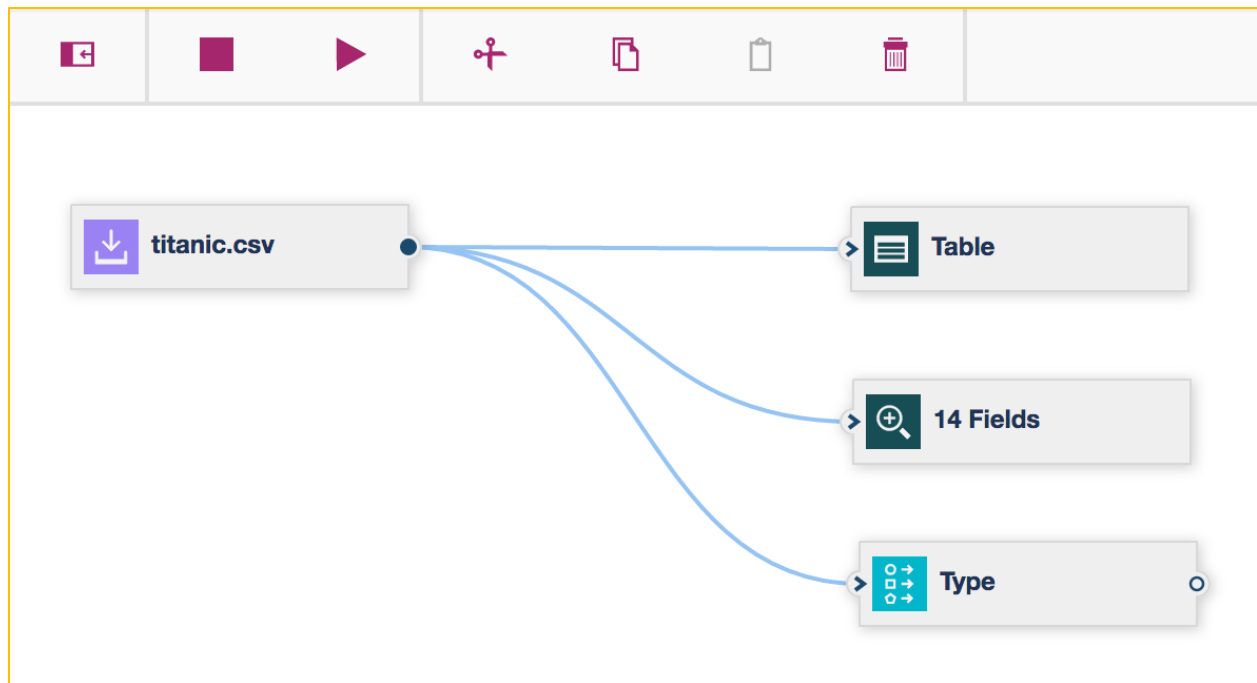
Step 2.3 Explore the Data using Graph Nodes.

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

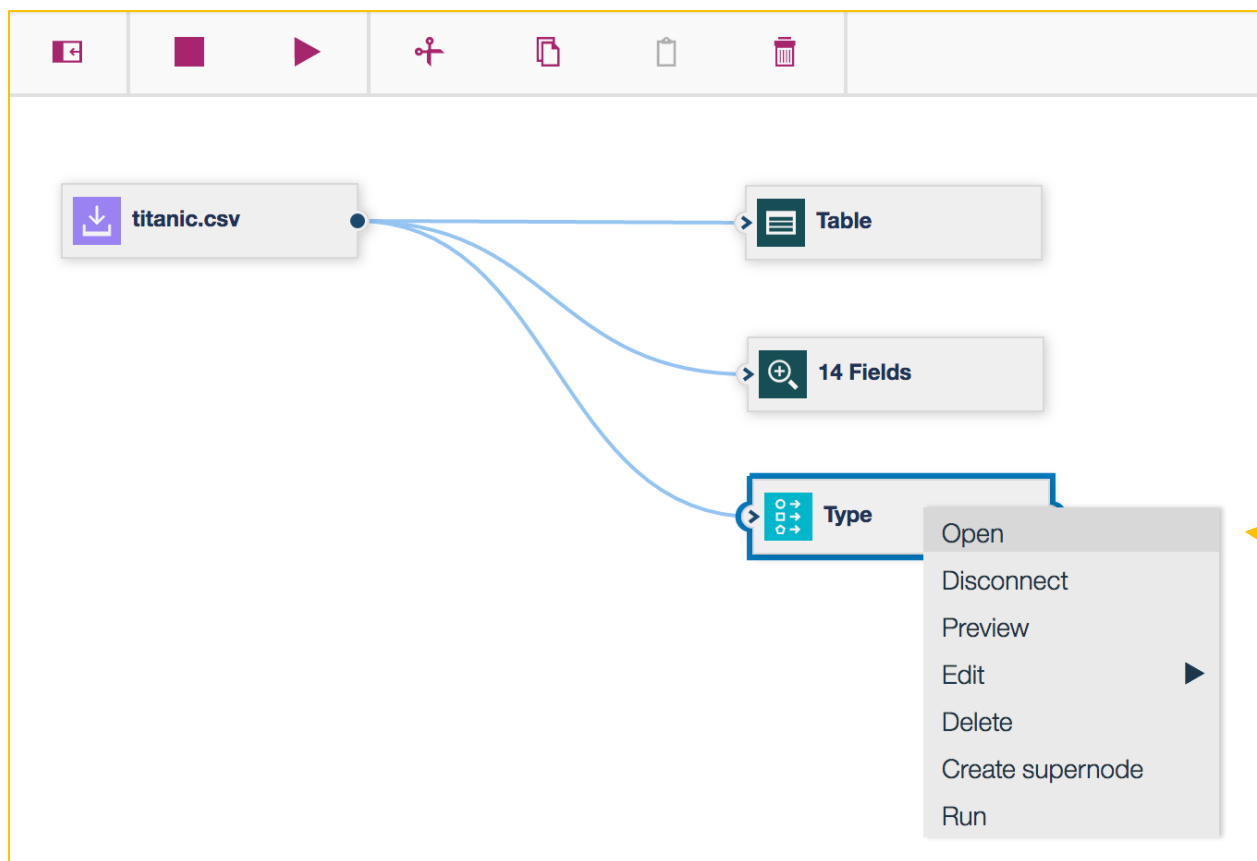
measurement property for the “pclass” and “survived fields” that was derived as “Continuous” by scanning the data values to “Ordered Set” and “Flag” respectively.

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.

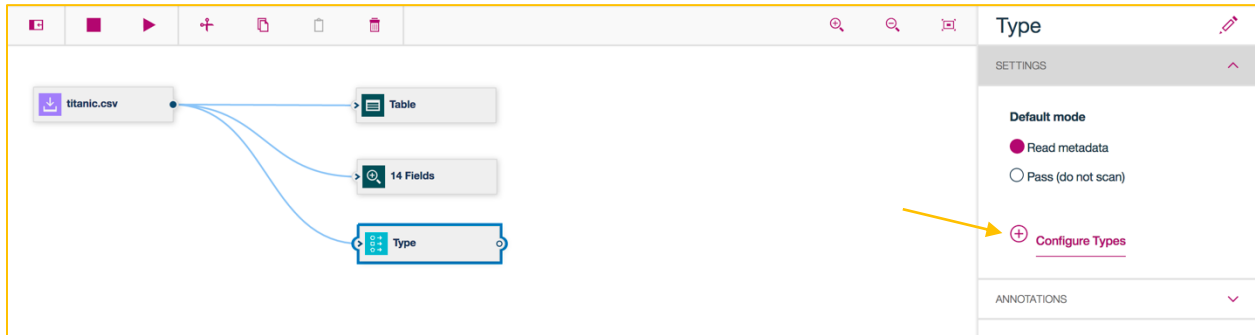




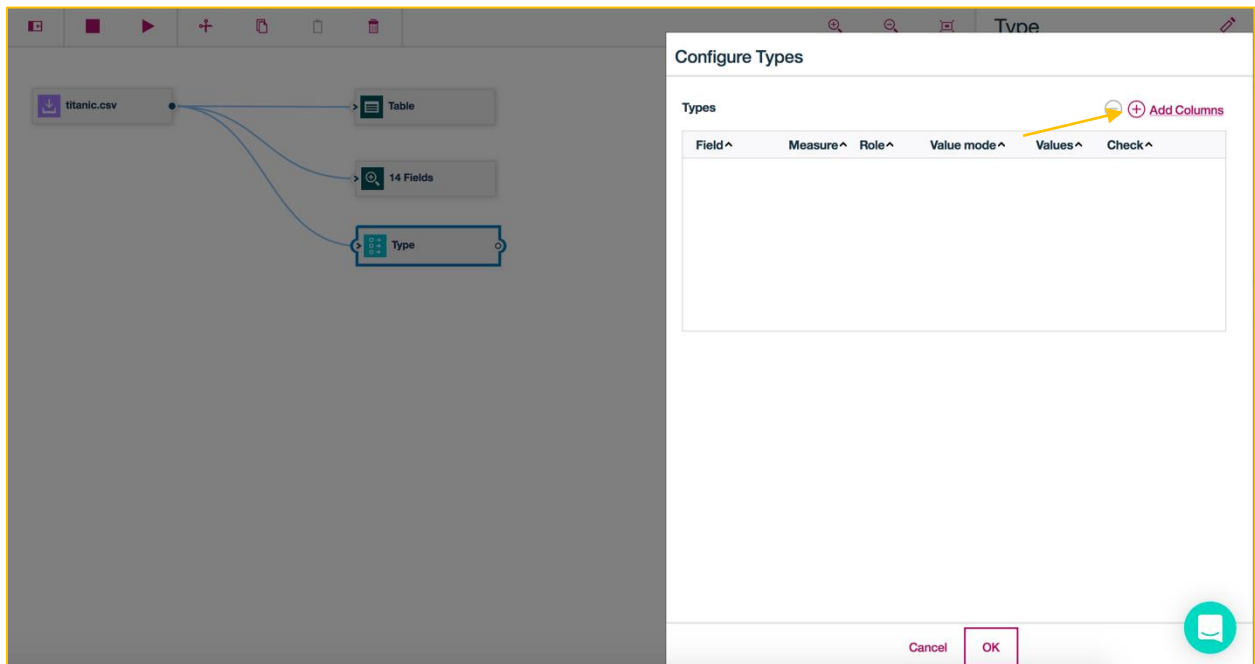
2. Double click on the **Type** node. This will open a **Type** menu pallet on the right side of the screen.



3. Click on the **Settings** dropdown. Select **Configure Types**.



4. Select **Add Columns**.



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

Configure Types

Read Values

Types

  [Add Columns](#)

Field^	Measure^	Role^	Value mode^	Values^	Check^
pclass	Ordinal	Input	Read	None	<input type="checkbox"/>
survived	Flag	Input	Read	None	<input type="checkbox"/>

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 **OK**.

Configure Types

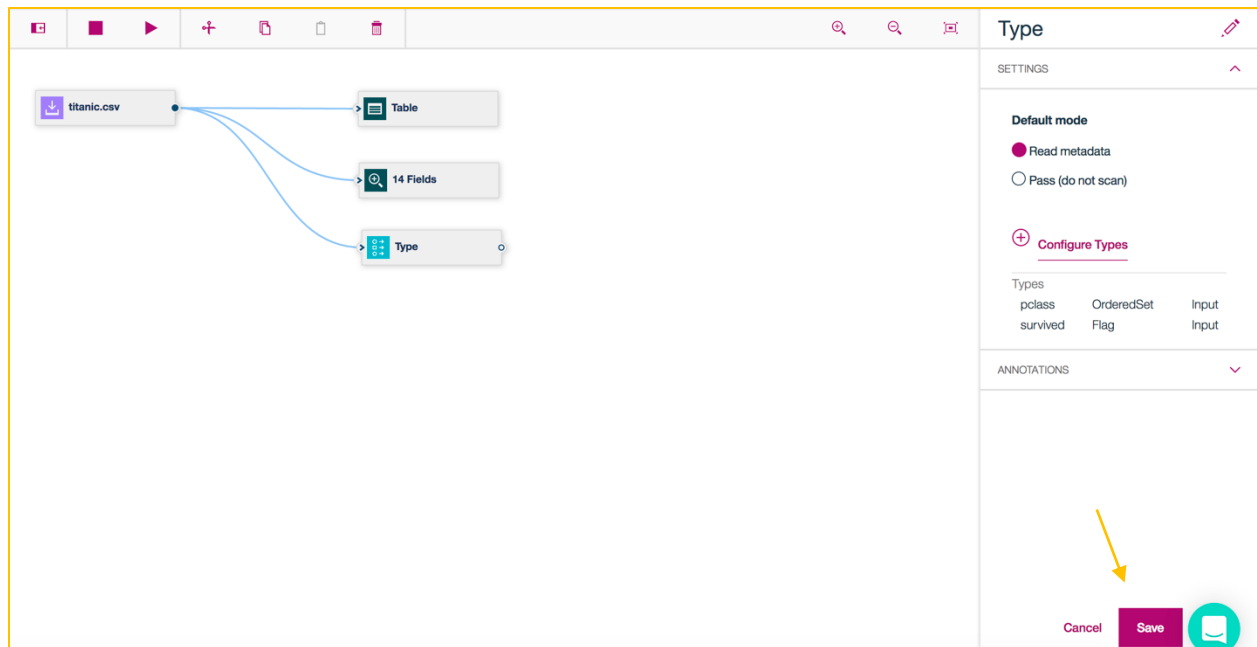
[Read Values](#)


Types ⊖ ⊕ Add Columns

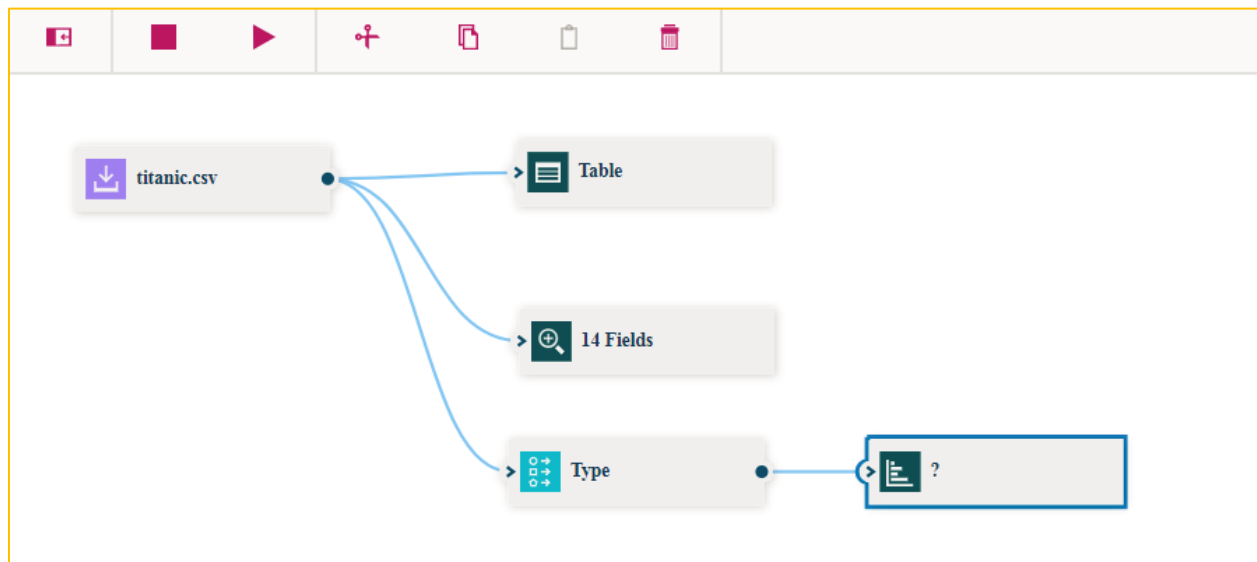
Field^	Measure^	Role^	Value mode^	Values^	Check^
pclass	Ordinal	Input	Read		None
survived	Flag	Input	Read		None

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

- Click on **Save** in the bottom right of the Types pallet.



8. 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.



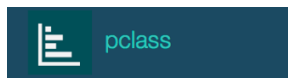
9. Double click on the Distribution Node. Click on the **Plot** dropdown. In the Field (discrete) dropdown, select **pclass**. In the Color (discrete) dropdown, select **survived**. Click on the **normalize by color** checkbox, and then click **Save**.

The screenshot shows the Orange3 data mining software interface. On the left, a workflow is visible with nodes: 'titanic.csv', 'Table', '14 Fields', 'Type', and a 'Distribution' node (represented by a bar chart icon with a question mark). A yellow arrow points to the 'Distribution' node. On the right, the 'Distribution' node's configuration panel is open. It has several sections: 'PLOT' with radio buttons for 'Specified' (selected) and 'All flags (true values)'; 'Field (discrete)' with a dropdown menu showing 'pclass'; 'Color (discrete)' with a dropdown menu showing 'survived'; 'Sort' with radio buttons for 'Alphabetic' (selected) and 'By count'; a checked checkbox for 'Normalize by color'; and an unchecked checkbox for 'Use proportional scale'. Below these are sections for 'APPEARANCE' and 'ANNOTATIONS'. At the bottom of the panel are 'Cancel' and 'Save' buttons, with a yellow arrow pointing to the 'Save' button.

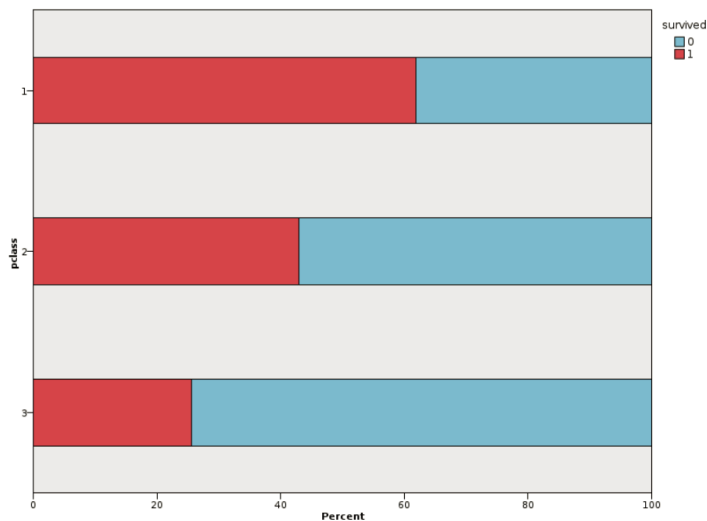
10. Right click on the Distribution node, and select Run.

The screenshot shows the same Orange3 workflow as before. A right-click context menu is open over the 'Distribution' node, which now displays 'pclass' instead of a question mark. The menu options are: 'Open', 'Disconnect', 'Preview', 'Edit', 'Delete', 'Create supernode', 'Save as a model', and 'Run'. A yellow arrow points to the 'Run' option at the bottom of the menu.

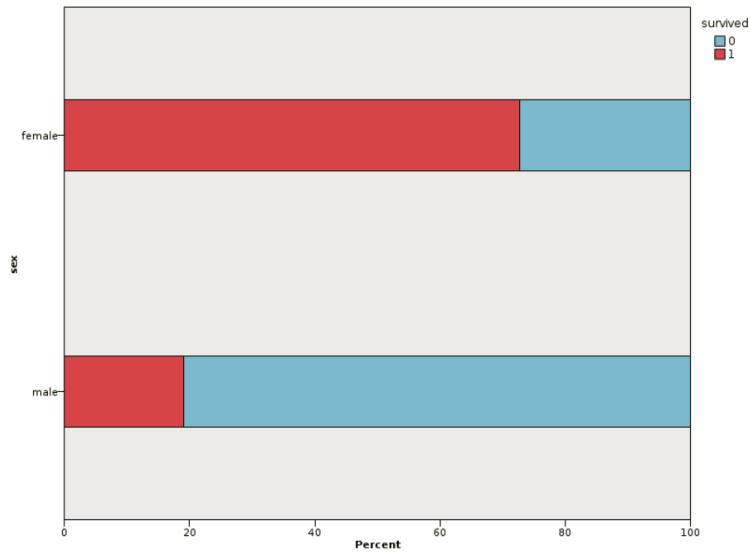
11. The Distribution of pclass output will appear under the **Outputs** tab.




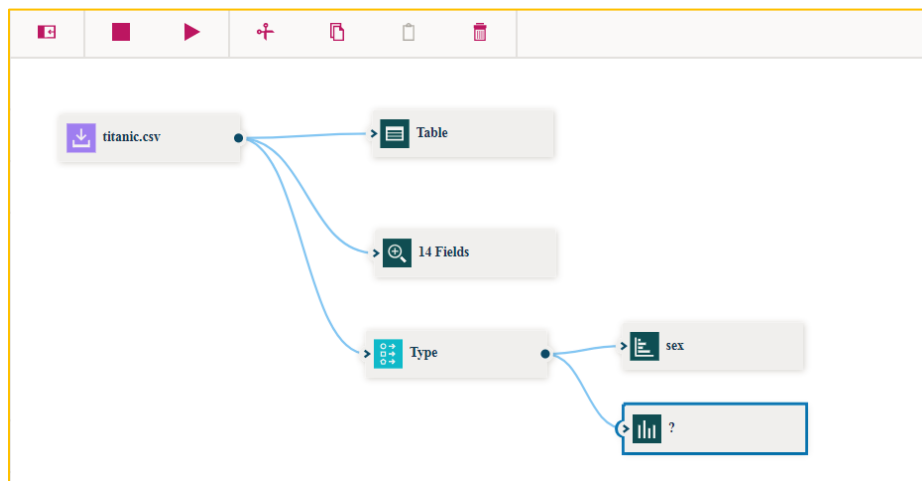
12. Double click on the **Distribution of pclass** to view the graph. We can see from the graph that the likelihood of surviving is correlated to the passenger class. The first class passengers have the highest rate of survivability. **Note if you see a graph with green bars, instead of the one below,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



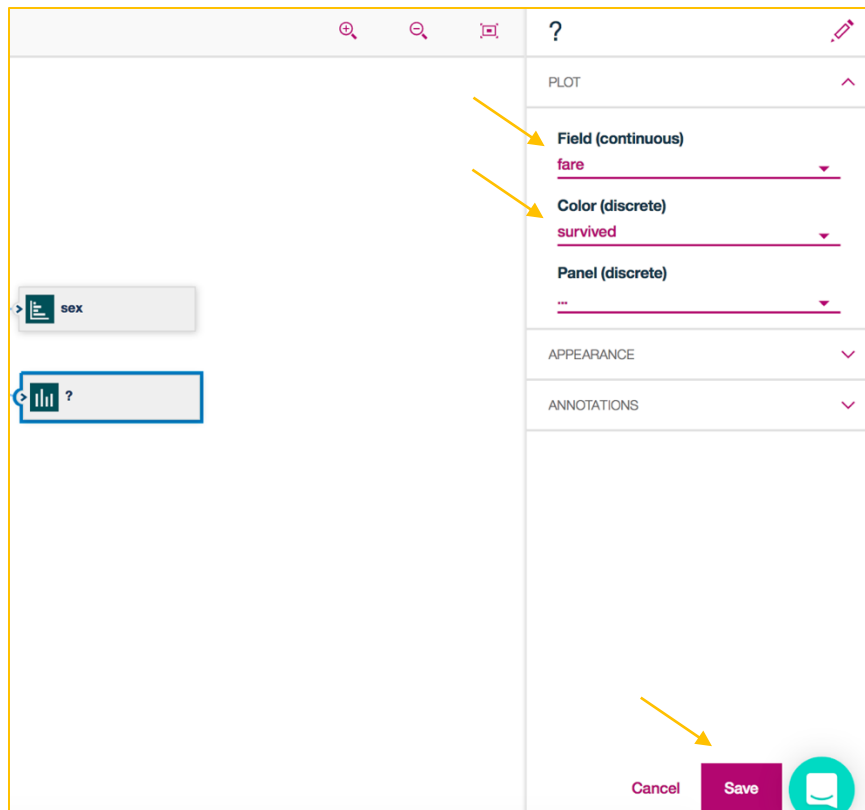
13. You can change the distribution graph to show the survivability by gender by double clicking on the Distribution node and replacing **pclass** with **sex** and clicking Save. Re-run the graph by right clicking on the Distribution node and selecting Run. Double click on the **Distribution of sex** to display the graph.



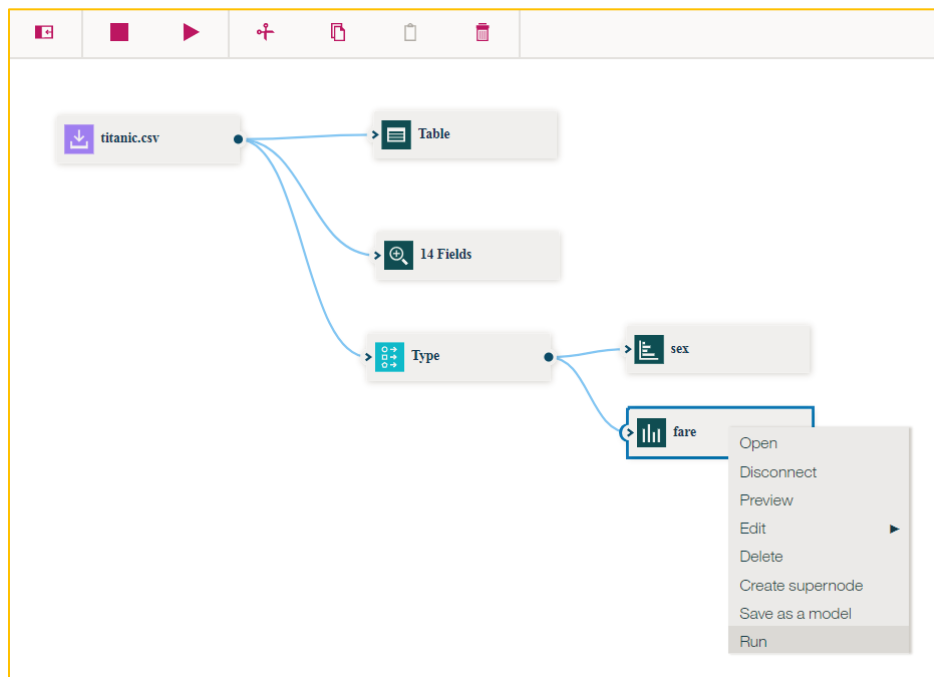
14. Add a **Histogram** node to the flow by clicking on the **Graphs** menu item and then dragging the **Histogram** node to the canvas underneath the **Distribution** node. If the Node Palette is not visible, click on the Node Palette icon . Connect the **Type** node to the **Histogram** node. The canvas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



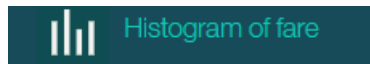
15. Double click on the **Histogram** node. Click on the **Plot** dropdown. Select **fare** from the Field (continuous) dropdown. Select **survived** from the Color (discrete) dropdown. Click on **Save**.



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

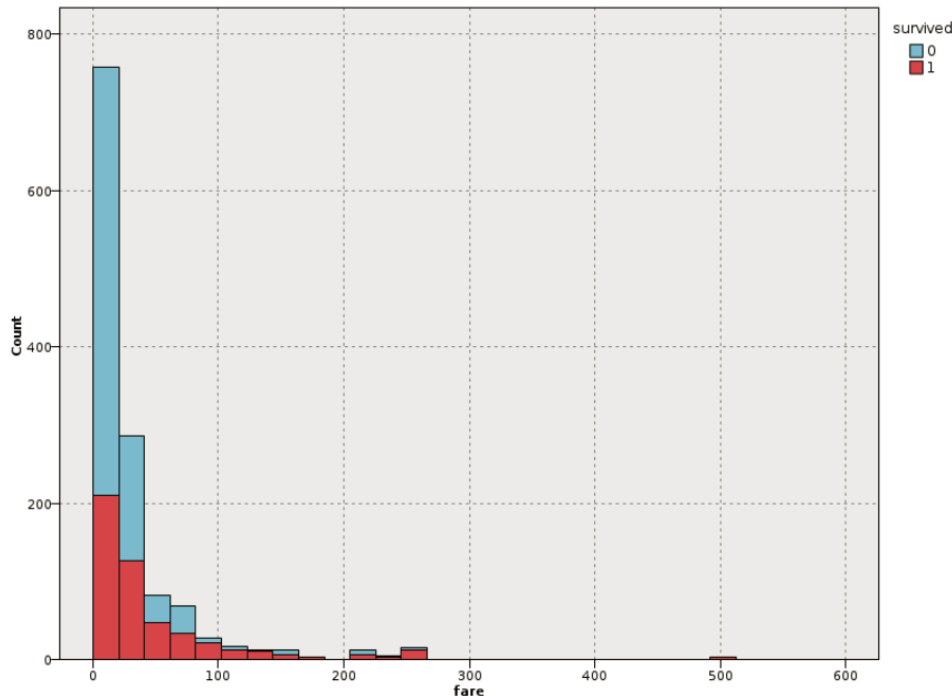


17. Double click on the Histogram of fare



under the Outputs

tab at the right of the screen.



18. 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

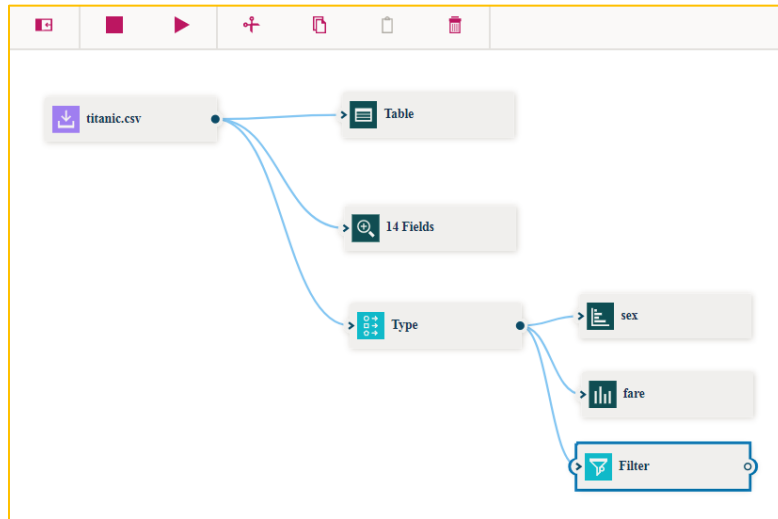
Based on our exploration of the data, there are several transformations that are needed to prepare the data for modeling. This section will introduce, the **Filter** node, the **Select** node, and the **Derive** node that will do the necessary transformations. The **Filter** and **Derive** nodes act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

Filter

FILTER

Mode

☒ Filter the selected fields

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

Select Fields [Add Columns](#)

RENAME

ANNOTATIONS

3. 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	<div></div> integer
<input type="checkbox"/> survived	<div></div> integer
<input type="checkbox"/> name	<div>A</div> string
<input type="checkbox"/> sex	<div>A</div> string
<input type="checkbox"/> age	<div></div> double
<input type="checkbox"/> sibsp	<div></div> integer
<input type="checkbox"/> parch	<div></div> integer
<input type="checkbox"/> ticket	<div>A</div> string
<input type="checkbox"/> fare	<div></div> double
<input checked="" type="checkbox"/> cabin	<div>A</div> string
<input type="checkbox"/> embarked	<div>A</div> string
<input checked="" type="checkbox"/> boat	<div>A</div> string
<input checked="" type="checkbox"/> body	<div></div> integer
<input checked="" type="checkbox"/> home.dest	<div>A</div> string

Cancel

OK

4. 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

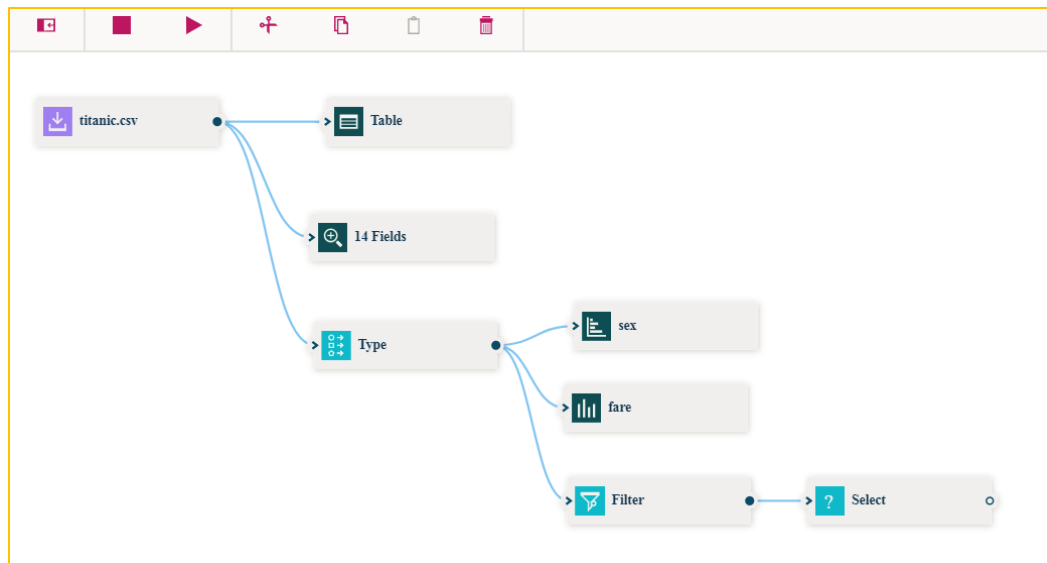
home.dest

RENAME

ANNOTATIONS

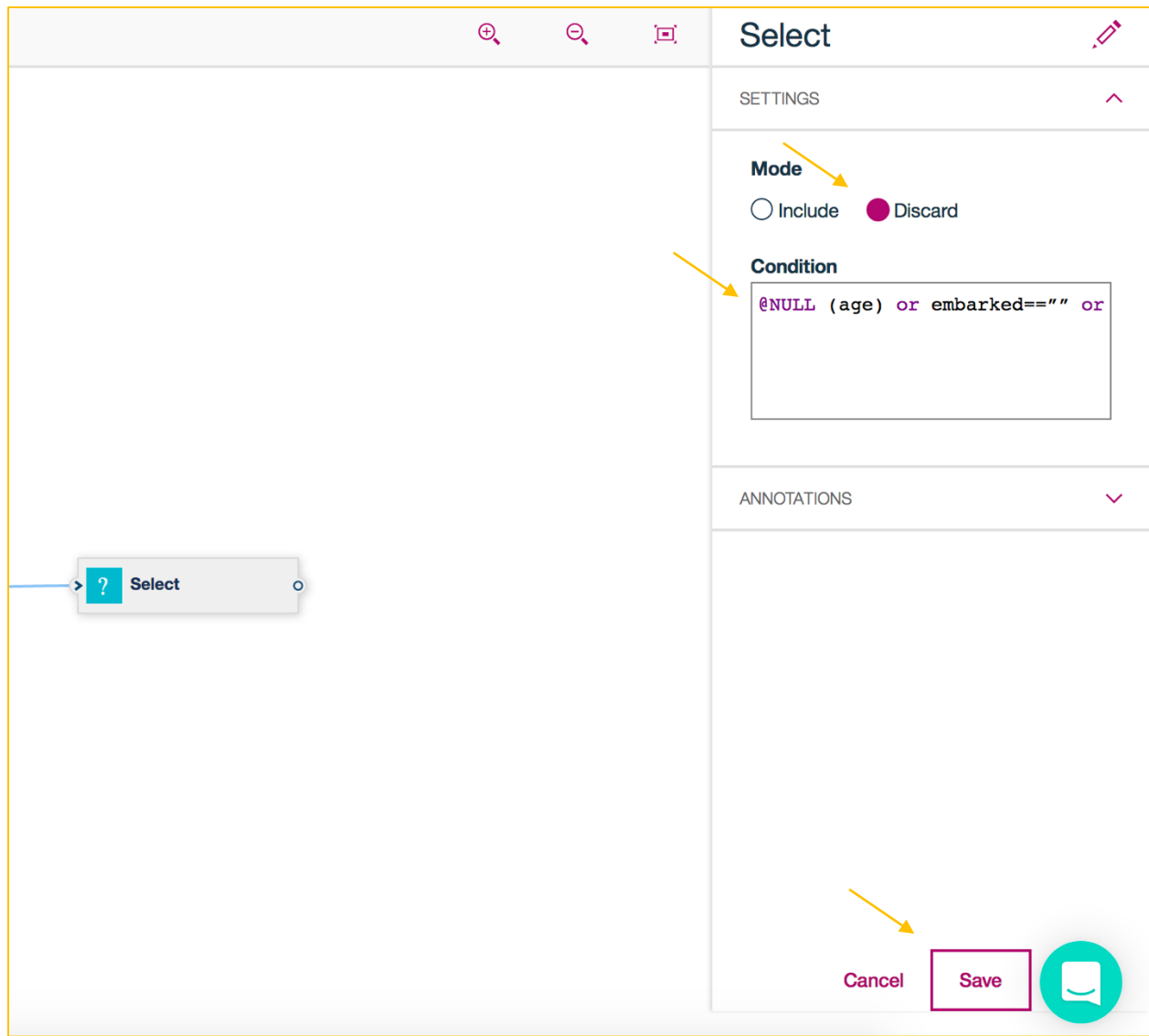
Cancel Save


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.

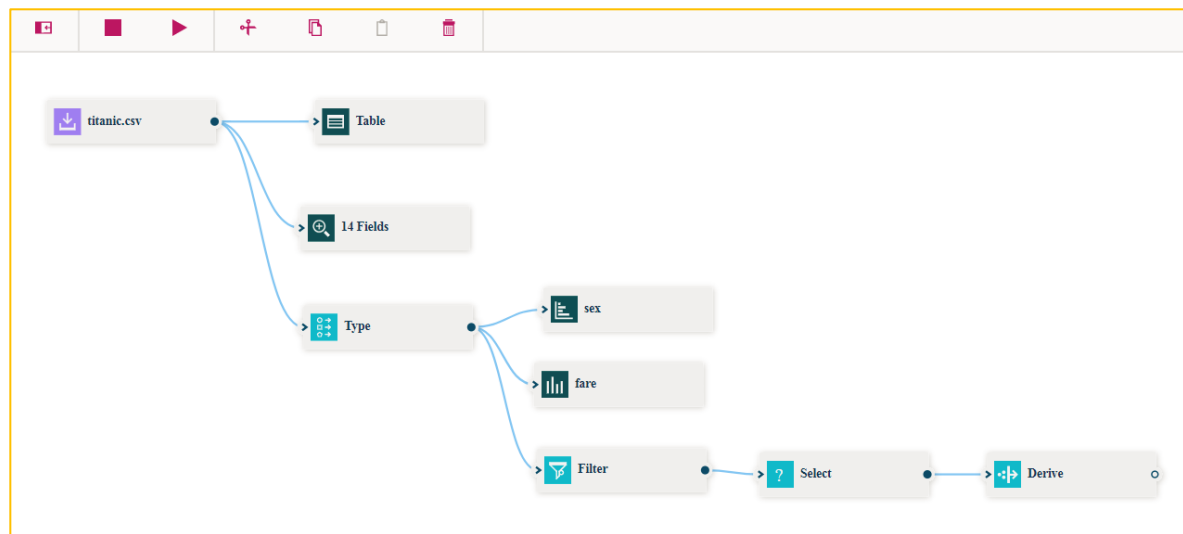


6. Double click on the **Select** node. Click on the **Settings** dropdown. In the **Select** panel, click on the **Discard** radio button, and re-type in the code shown below in the **Condition** text box, and then click **Save**.

@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.



8. 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 **Range** for the measurement, enter the following code in the **Expression** text box, and click Save.


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

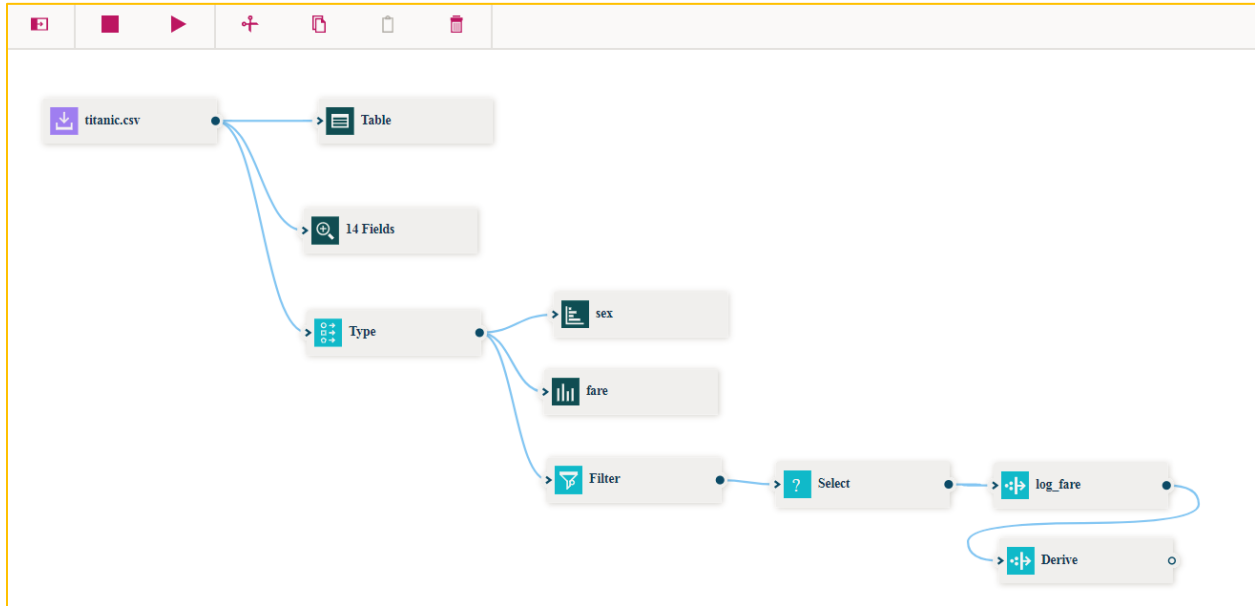
```
else 0
```

```
endif
```

The screenshot shows the 'Derive' node settings in QGIS. The 'SETTINGS' dropdown is open. The 'Mode' section has 'Single' selected. The 'Derive field' is 'log_fare'. The 'Derive As' dropdown is 'Formula'. The 'Measurement' dropdown is 'Range'. The 'Expression' text box contains the code: 'if (fare /=0) then log(fa', 'else 0', 'endif'. The 'Save' button is highlighted with a red box.

9. 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 **Derive** field, select OrderedSet for the **Measurement**, enter 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
```

Derive

SETTINGS

Mode

☒ Single

☐ Multiple

Derive field

age_bucket

118

Derive As

Formula

Measurement

OrderedSet

Expression

```
if age >=0 and age < 6 th
else if age >=6 and age <
else if age>=12 and age<
else if age>=18 and age <
```

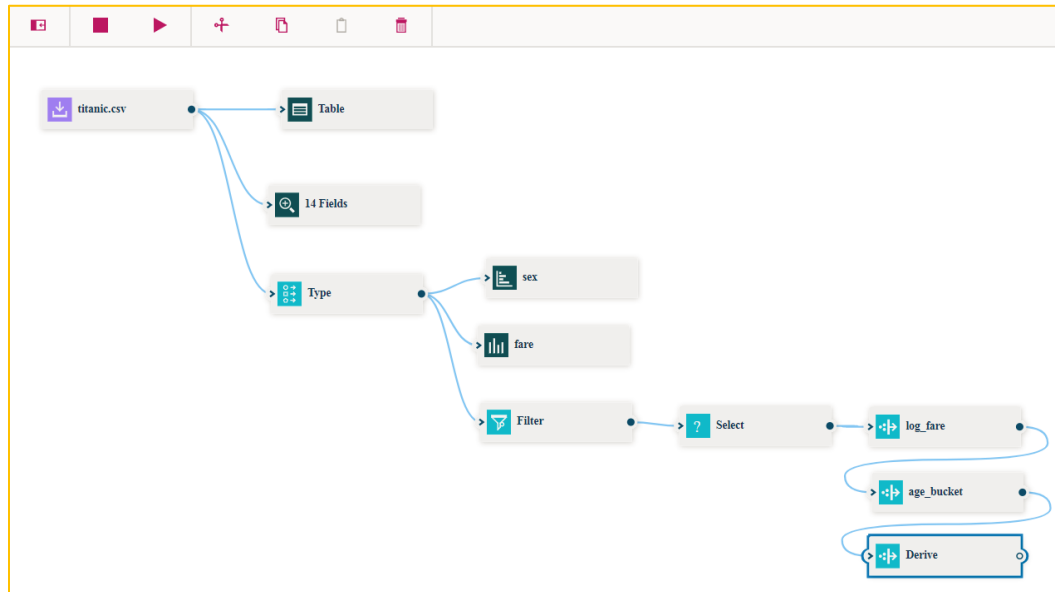
Cancel

Save

?

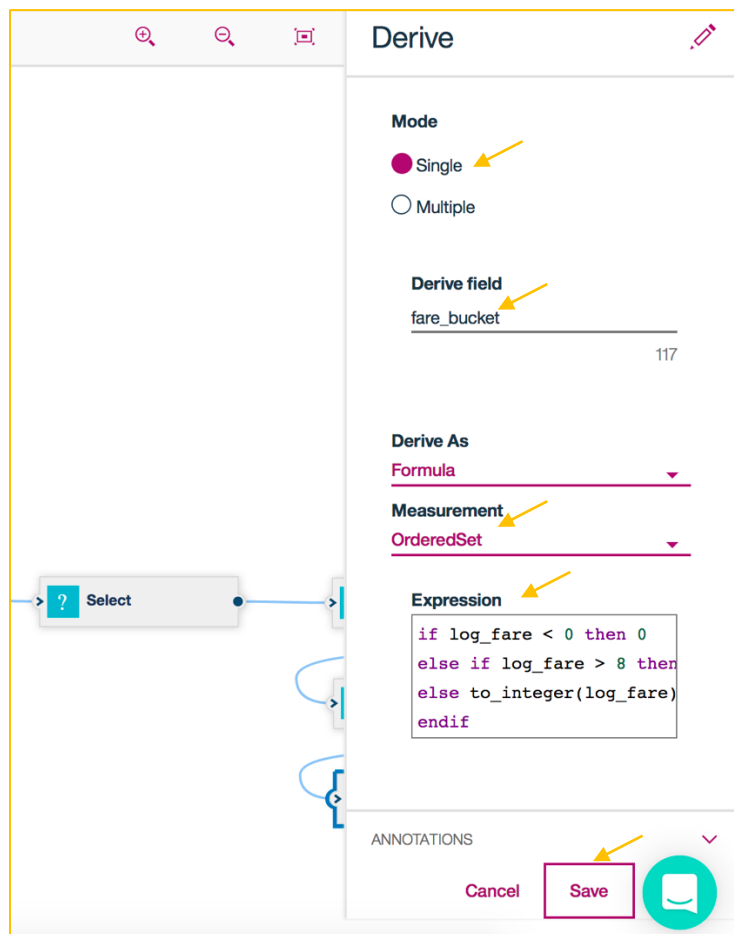
Select

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 **Derive field**, click on OrderedSet for the **Measurement**, enter the following code in the **Expression** text box, and click on **Save**.

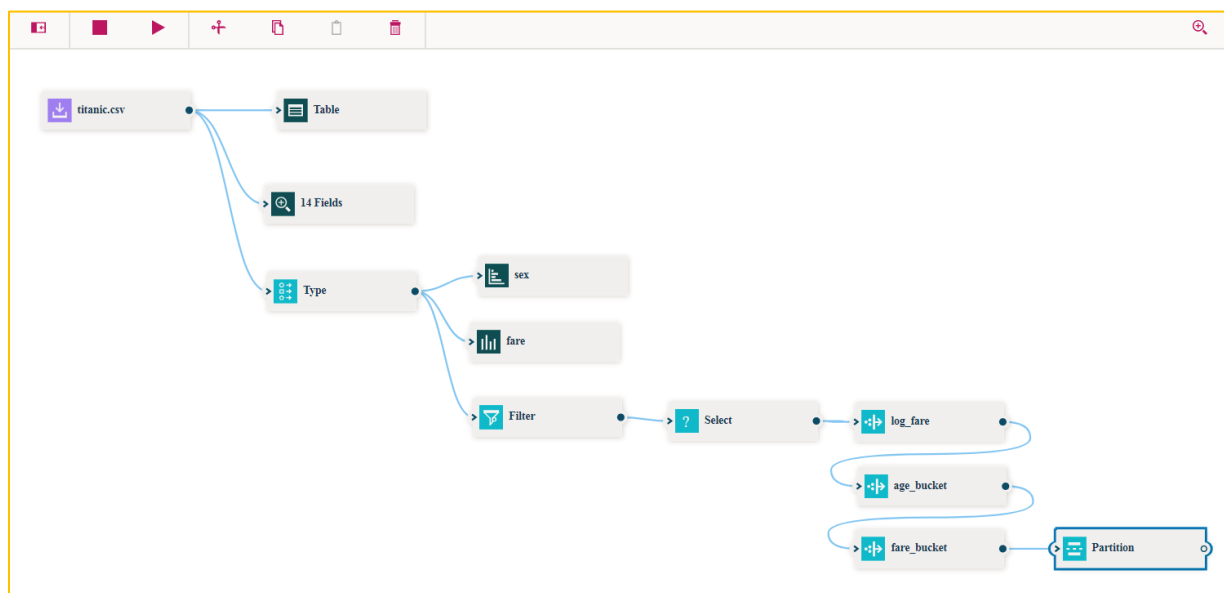
```
if log_fare < 0 then 0
else if log_fare > 8 then 9
else to_integer(log_fare)+1
endif
endif
```



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 interface. On the left, a 'Select' node is connected to the 'Partition' node. The 'Partition' node's settings are displayed on the right, with yellow arrows pointing to the 'Training Partition' and 'Testing Partition' fields. The 'Training Partition' is set to 70 and the 'Testing Partition' is set to 30. The 'Derived Field Name' is 'Partition' with a count of 119. The 'Seed' is 1234567. The 'Repeatable partition assignment' checkbox is checked. The 'Annotations' section is empty. At the bottom, there are 'Cancel' and 'Save' buttons, with a yellow arrow pointing to the 'Save' button.

Partition

SETTINGS

Derived Field Name
Partition
119

Training Partition
70

Testing Partition
30

☐ Create validation partition

☒ Repeatable partition assignment

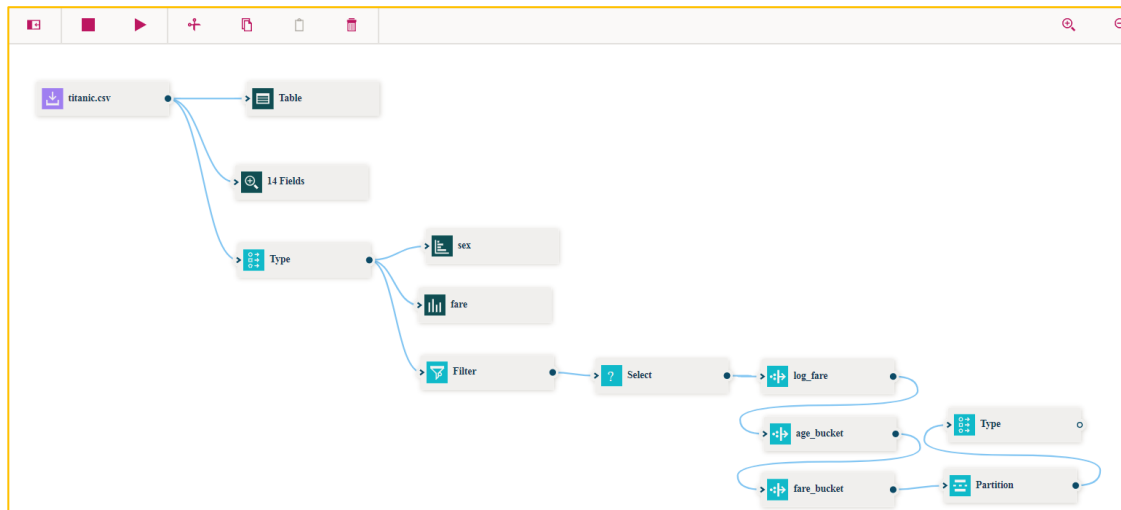
Seed [Generate](#)
1234567

☐ Use unique field to assign partitions

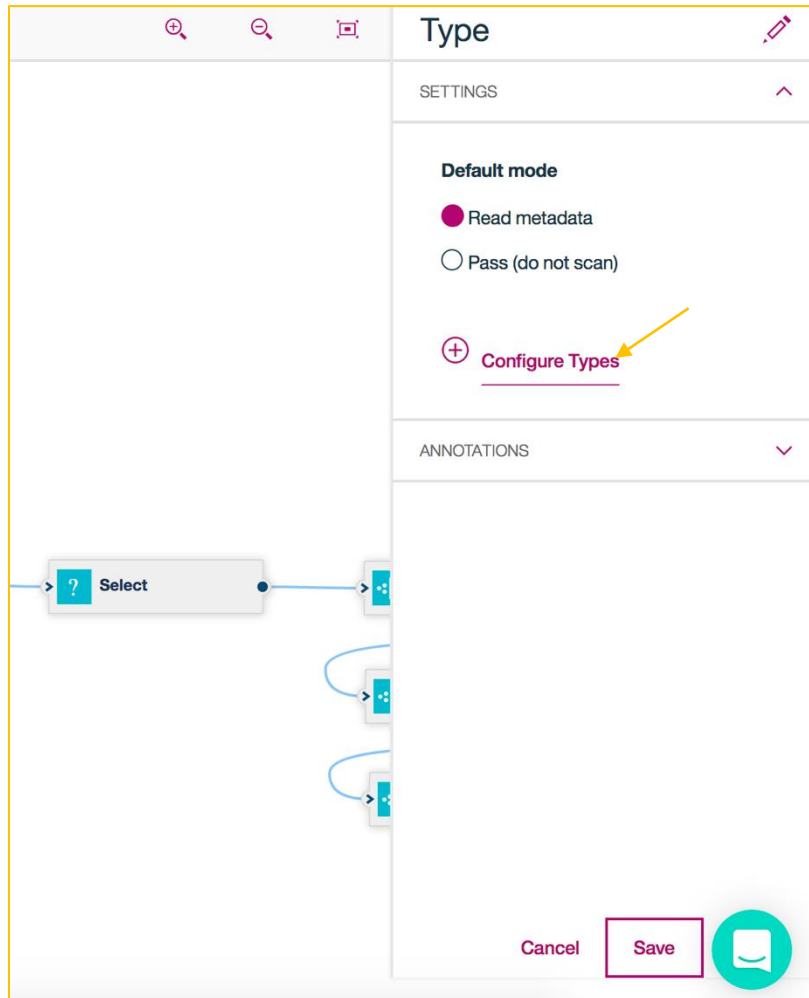
ANNOTATIONS

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

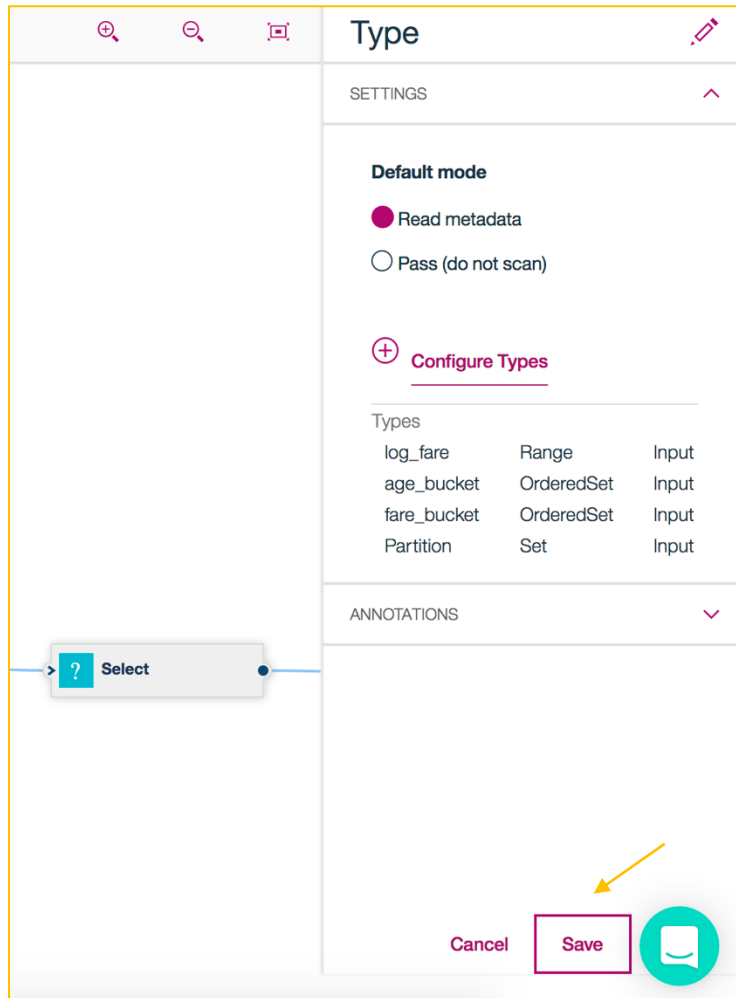
Add Columns

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

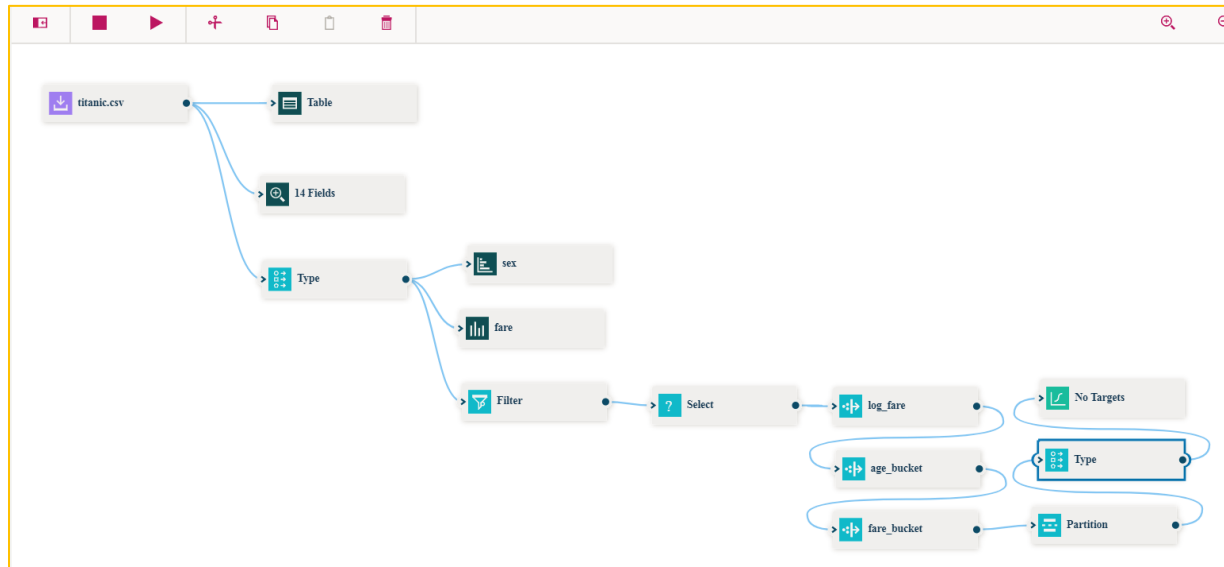
Cancel

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)


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

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**.

The screenshot shows a configuration window titled "No Targets" with a search icon and a refresh icon in the top left. The window is divided into two main sections: "FIELDS" and "ANNOTATIONS".

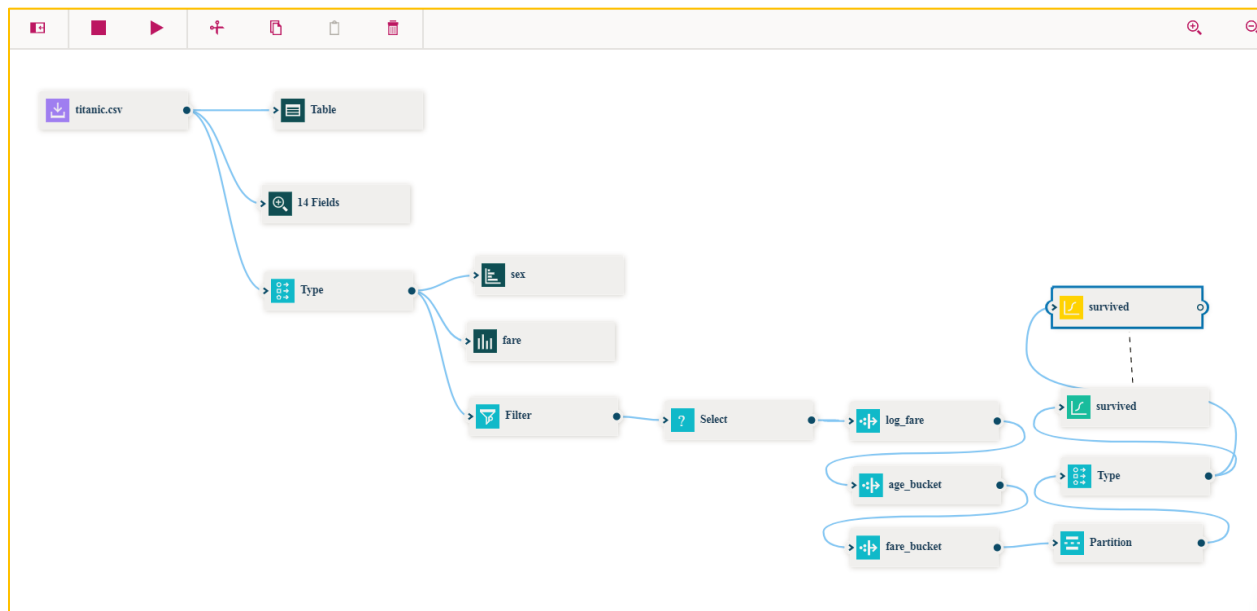
FIELDS

- ☒ Use custom field roles
- Target**
survived
- Inputs** (with minus and plus icons, and a link "Add Columns")
parch
embarked
age_bucket
fare_bucket
- Partition**
Partition

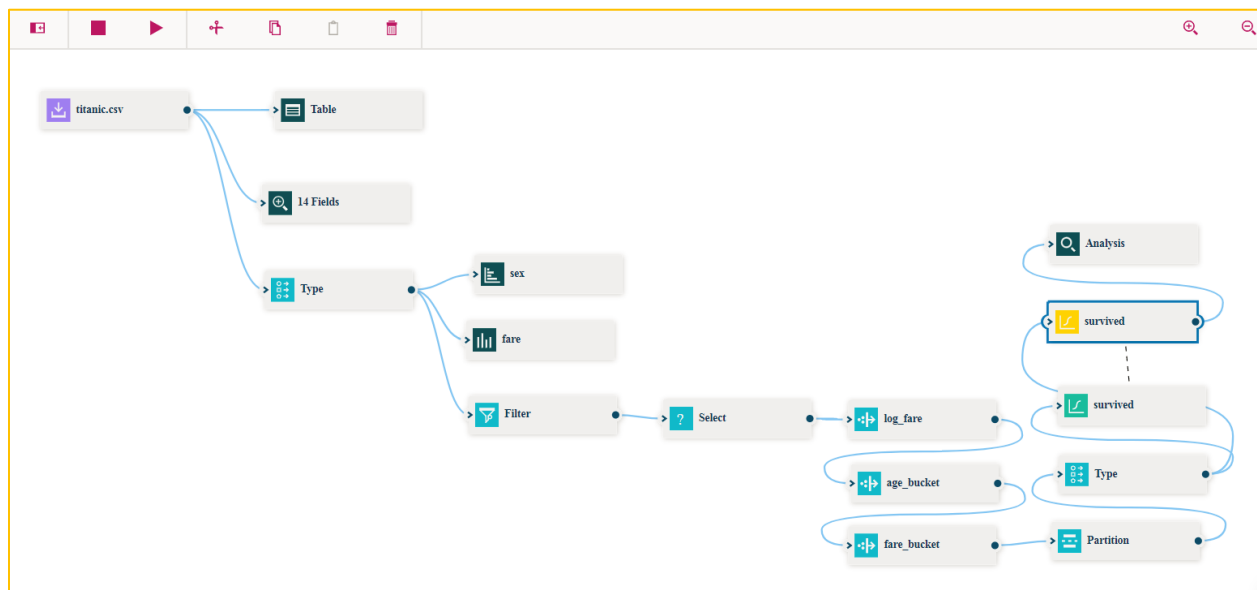
ANNOTATIONS

On the left side of the window, there is a "Select" button with a question mark icon. At the bottom right, there are "Cancel" and "Save" buttons. A yellow arrow points to the "Save" button. A teal circular icon with a speech bubble is also visible next to the "Save" button.

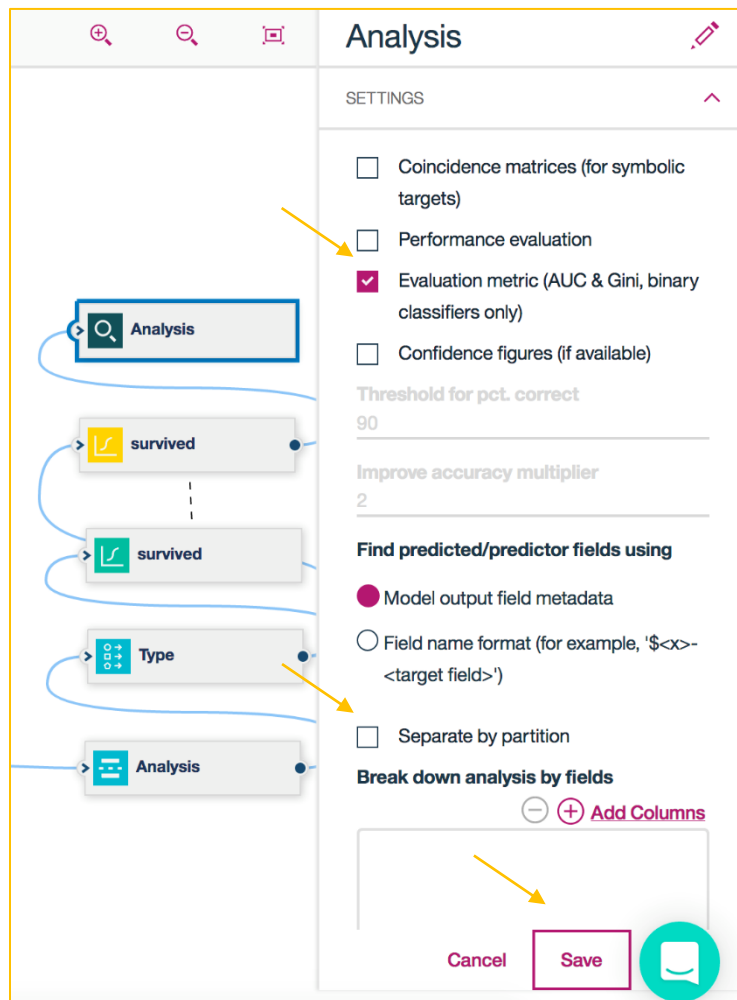
13. Right click on the **Logistic Regression** node and then click **Run**. A **Logistic Regression** “nugget” will be created” connected by a dotted line to the **Logistic Regression** node. Drag the nugget and place it above the **Logistic Regression** node. The canvas should appear as below.




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**.



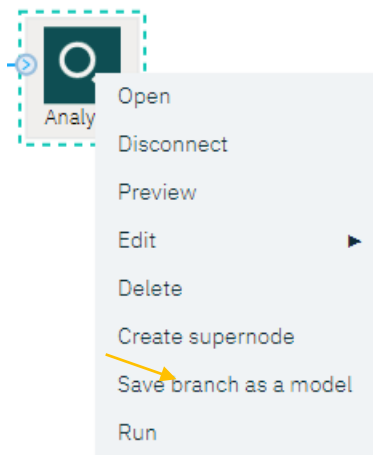
16. Right click on the Analysis node, and select Run. After completion, double click on the  link in the Outputs tab on the right side of the screen. The results should be similar to those shown below.

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**.



If you receive a “Required Service Missing” page, proceed to step 1.A. If you do not receive this page, proceed to step 2.

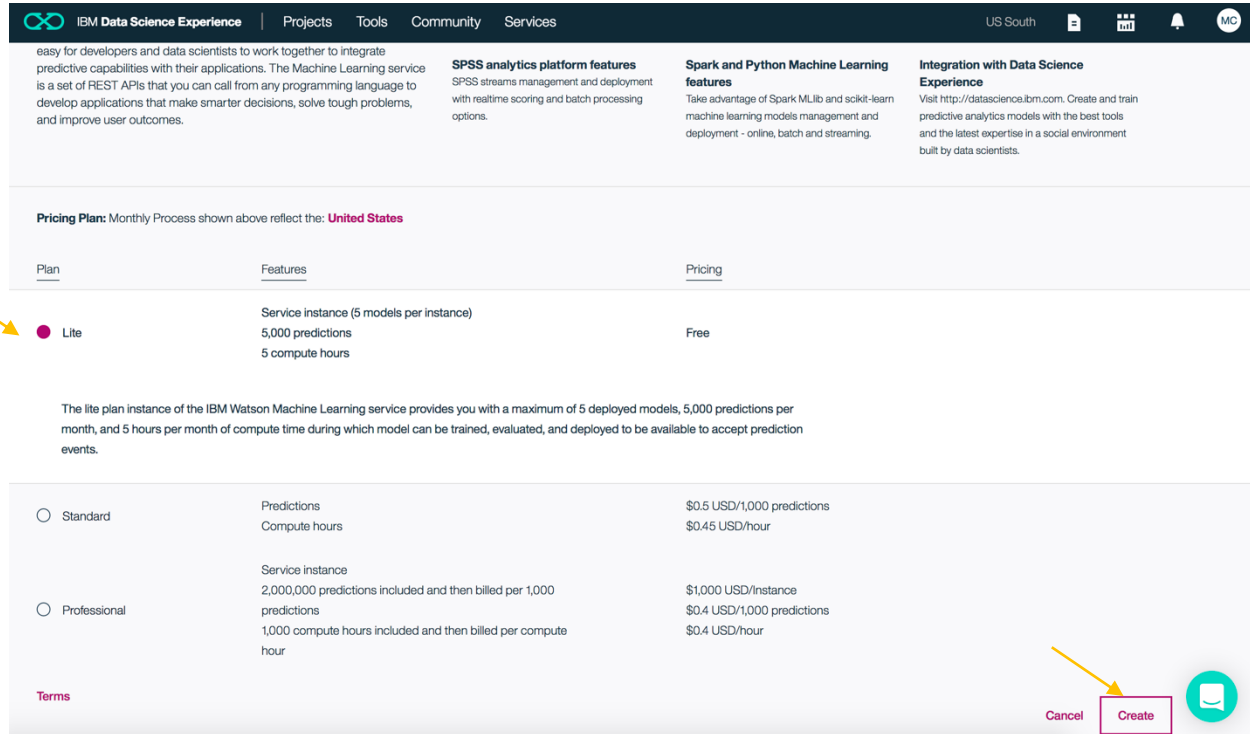
- 1.A. Click on **“Create a new Watson Machine Learning service instance.”**

Required Service Missing

No Watson Machine Learning instances found.
[Create a new Watson Machine Learning service instance](#) to save your model.

Close

1.B. Scroll down and click on “**Lite**” to select the Lite plan and then click on **Create**.



IBM Data Science Experience | Projects Tools Community Services US South

easy for developers and data scientists to work together to integrate predictive capabilities with their applications. The Machine Learning service is a set of REST APIs that you can call from any programming language to develop applications that make smarter decisions, solve tough problems, and improve user outcomes.

SPSS analytics platform features
SPSS streams management and deployment with realtime scoring and batch processing options.

Spark and Python Machine Learning features
Take advantage of Spark MLlib and scikit-learn machine learning models management and deployment - online, batch and streaming.

Integration with Data Science Experience
Visit <http://datascience.ibm.com>. Create and train predictive analytics models with the best tools and the latest expertise in a social environment built by data scientists.

Pricing Plan: Monthly Process shown above reflect the: **United States**

Plan	Features	Pricing
<input checked="" type="radio"/> Lite	Service instance (5 models per instance) 5,000 predictions 5 compute hours	Free
<input type="radio"/> Standard	Predictions Compute hours	\$0.5 USD/1,000 predictions \$0.45 USD/hour
<input type="radio"/> Professional	Service instance 2,000,000 predictions included and then billed per 1,000 predictions 1,000 compute hours included and then billed per compute hour	\$1,000 USD/instance \$0.4 USD/1,000 predictions \$0.4 USD/hour

The lite plan instance of the IBM Watson Machine Learning service provides you with a maximum of 5 deployed models, 5,000 predictions per month, and 5 hours per month of compute time during which model can be trained, evaluated, and deployed to be available to accept prediction events.

Terms

Cancel Create

1.C. Click on **Confirm**.

Confirm Creation

Organization: michael.cronk_organization1

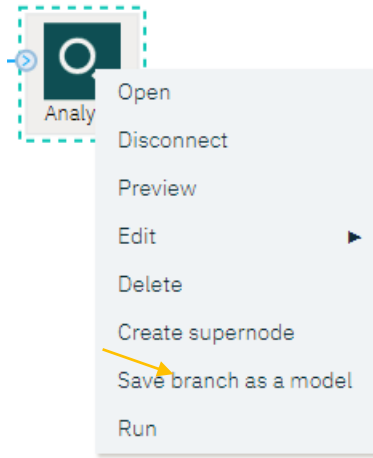
Plan
Lite ▼

Space
space1 ▼

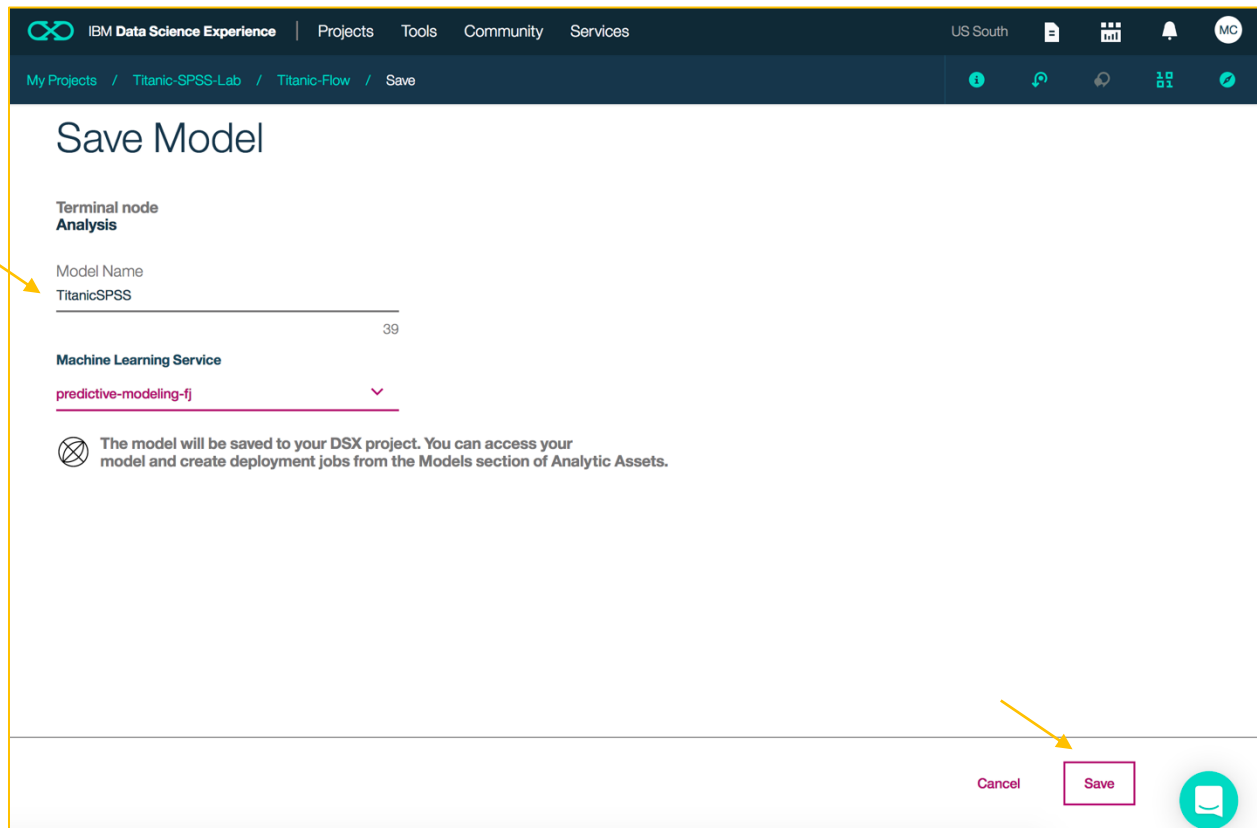
Service name
predictive-modeling-fj

Cancel **Confirm**

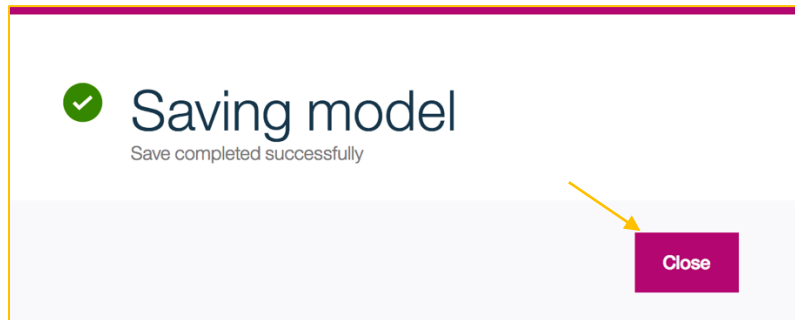
1.D. Return to your SPSS flow. Right click on the Analysis node and then click on **Save as a model**.



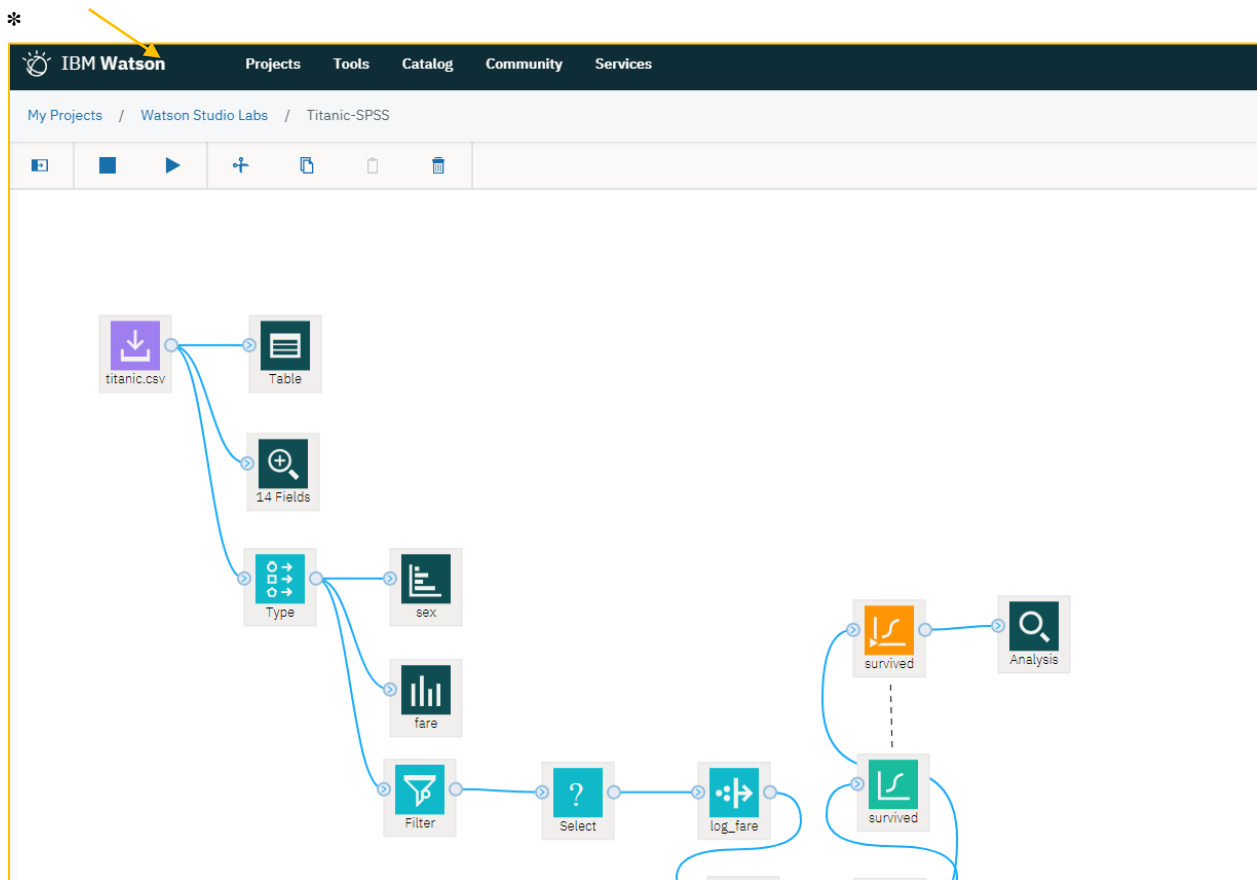
2. Type in “**TitanicSPSS**” as the Model Name and click **Save**.



3. Click **Close**.



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



- 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. The top navigation bar includes 'IBM Data Science Experience', 'Projects', 'Tools', 'Community', and 'Services'. The user is logged in as 'MC' and is in the 'US South' region. The current project is 'Titanic-SPSS-Lab'. Below the navigation bar, there is a section for '0 assets selected.' with a table that has columns: NAME, SHARED, LAST EDITOR, LAST MODIFIED, and ACTIONS. A message below the table states 'you currently have no dashboard'. Below this, there is a section for 'Models' with a '+ New model' button. A table lists the models with columns: NAME, STATUS, TYPE, RUNTIME, LAST MODIFIED, and ACTIONS. The first model listed is 'TitanicSPSS' with status 'trained', type 'spss-modeler-18.1', runtime 'spss-modeler-18.1', and last modified '13 Feb 2018'. A yellow arrow points to the 'TitanicSPSS' model entry.

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