SAS Studio Exercise 10

Linear Regression with Assumptions

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**Sources**

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SAS® Studio. Release 5.2

SAS® VIYA® release V.03.05

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# Use Case – Linear Regression

Razorback Stores is a local department store serving a metropolitan area. As a department store, they offer a wide variety of items and services and track sales through a point of sale system. Over the past several months, Razorback Stores performed a marketing campaign designed to promote and incentivize a loyalty program.

As a recent hire, your boss has asked you to analyze the following:

* Are **net sales** significantly different between people who pay with different methods of payment (RazorCard, MasterCard, MasterCard, Visa, and Other)?

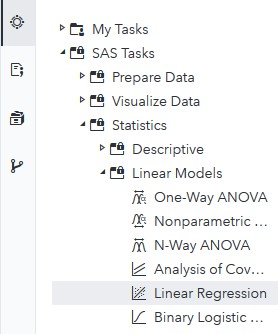
## Step 0: Navigate to SAS Studio/Activate CAS Session

Before jumping into ***Linear Regression*** *task, please refer back to* ***SAS Studio 01 – Logging into the System*** to understand how to navigate to SAS Studio, Activate a CAS Session, and Manage your Data.

We will be using **Razorback Stores** dataset which will be provided by your instructor and/or is available on blackboard. Once you have this dataset loaded on SAS Viya, following ***SAS Studio 01 – Logging into the System*** *tutorial,* load this dataset into memory in your personal **User** folder.

## Step 1: Tasks

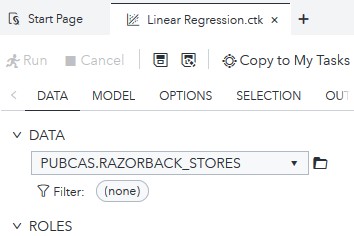
In order to access the **Linear Regression** task within SAS Studio:



1. Click on the **Tasks** icon located on the left-panel
2. Expand the **SAS Tasks** folder
3. Expand the **Statistics** folder
4. Expand the **Linear Models** folder
5. Double click **Linear Regression**

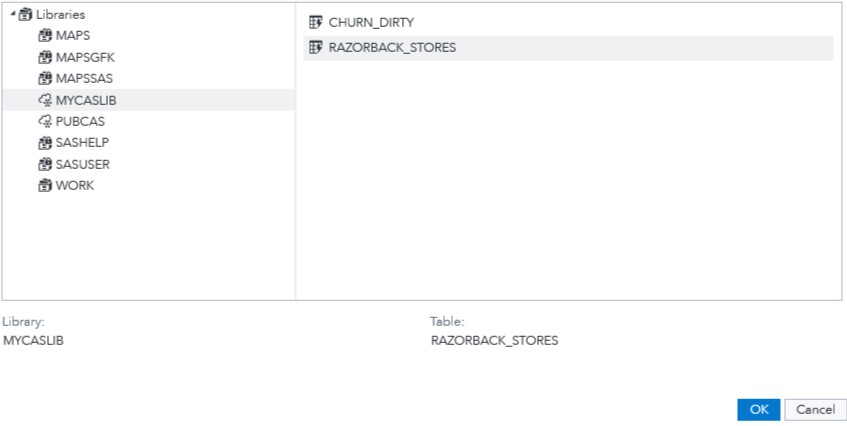
## Step 2: Select Data

Next, you need to select your data. In this case, we will be choosing **Razorback Stores** which can be found in our **User** folder. Under **DATA**,



1. Click on the folder icon located at the right of the current dataset in place

A new **Choose a Table** window will open,



1. Click on **Libraries**

A list of all the folders available to you will be displayed.

1. Click on **MYCASLIB** which references your **User** folder

All the different datasets found in your **User** folder will display.

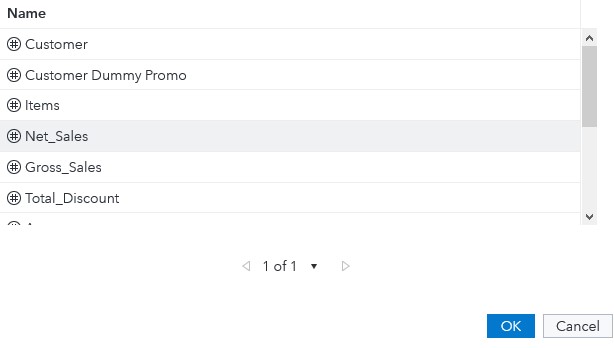
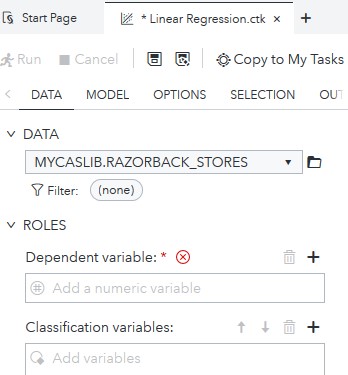
1. Click on **RAZORBACK\_STORES**
2. Click **OK**

## Step 3: Select Variables

Once you have **Razorback Stores** dataset selected, we need to select the variables we want to work with. Notice the red font color text at the bottom. It requires you to select **exactly one Dependent** and at least **one Classification** or **Continuous variable**. Under **ROLES**,notice you have three subtitles:

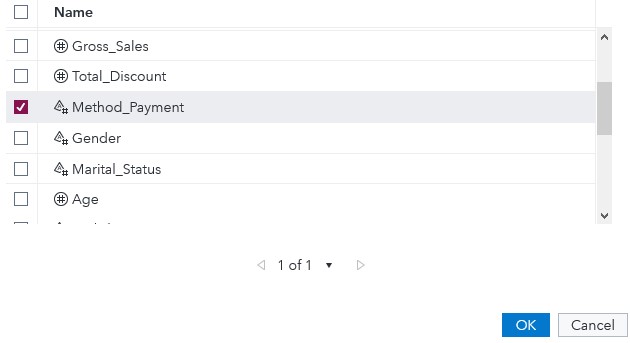
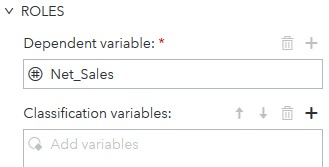
* 1. **Dependent variable:** what your dependent variable is. For this tutorial: **Net Sales**
  2. **Classification variables:** (independent variable) what your categorical variable is. For this tutorial: **Method of Payment**
  3. **Continuous variables:** (independent variable) what your continuous variable is. For this tutorial: none used

1. ­­­Click on the **+** sign to the right of **Dependent variable**



A new window will open, titled **Column Selection**.

1. Select **Net Sales**
2. Click **OK**
3. Click on the + sign to the right of **Classification variables**



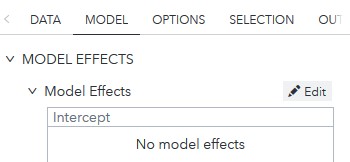
In the new window that opened,

1. Scroll down to find **Method of Payment**
2. Click to checkmark the box to the left of **Method of Payment**
3. Click **OK**

Note that once you have set both a dependent variable and an independent variable, there is still one red text at the very bottom that asks you to **add one or more effects to the model**.

## Step 4: Modify Settings

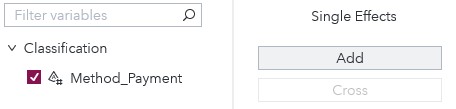
Once you have selected your dataset and variables, you can move to the **Model** tab where you will add effects to the model.



1. Click on the **MODEL** tab
2. Click on **Edit** next to **Model Effects**

A **Model Effects Builder** window will open.

1. Click to checkmark the box to the left of **Method of Payment**



1. Click on **Add**



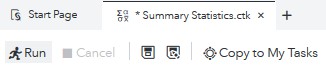
1. Click **OK**
2. Click on the **OPTIONS** tab



1. Select **95%** from the **Confidence level** dropdown menu

Notice that as we have selected a dataset, variables, and checked/unchecked settings, there is a code area on the right side of the screen that has been updating as we modified these.

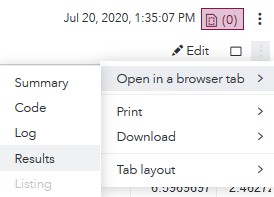
1. Click **Run**



## Step 5: Results

Once the task has executed, you will have your **Linear Regression** results view in the right most pane.

In order to better visualize the results, locate the three dots at the very right end of the screen under the current date and time.



1. Click on these three dots and,
2. Click on **Open in a browser tab**
3. Click on **Results**
4. Alternatively, you can click on the **Maximize preview** icon



A screenshot of a cell phone

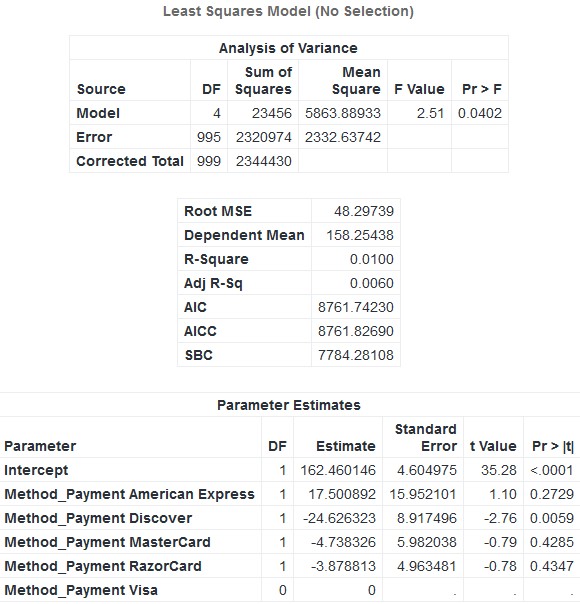
Description automatically generatedUnder **Results**, notice that you have different folders where you can find subfolders within.

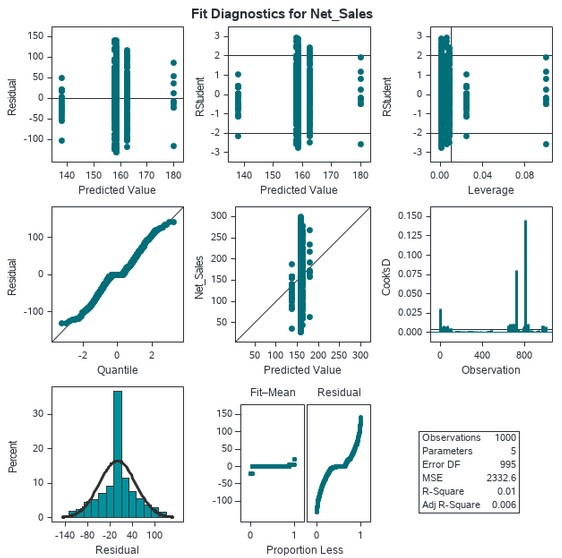
1. Expand all the folders
2. Click on the files inside

You will notice that as you click on these files, the tables and plots on the right window will change.

When clicking on any of these sections, SAS Studio will take you to the table/graph to which that section references in the right.

For the analysis we will be looking at the **Full Model** folder files that and the **Diagnostic Plots.**

Full Model:

Diagnostic Plots:

Congratulations, you have successfully performed a Linear Regression on SAS Studio!