SAS Studio Exercise 06

Paired Sample T-Tests

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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 – Paired Sample T-Test

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:

* Is there a difference between the type of customer (Regular – Promotional) and the amount of money (Net Sales) they spend in the store?

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

Before jumping into the ***t-Test*** 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 the Razorback Storesdataset 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 userfolder.

## Step 1: Tasks

In order to access the **t-Tests** taskwithin 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 **Descriptive** folder
5. Find **t Tests** and double click on it

## 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**
2. Click on **MYCASLIB** which references your **User** folder

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

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

## Step 3: Select Variables

Once you have **Razorback Stores** dataset selected, we need to change our test to a **Paired test** and select the variables we want to work with. Under **t-Test:**,

1. Select **Paired test** from the dropdown menu

Notice the red font color text at the bottom. It requires you to select two Group variables.

Notice also that you have now three subtitles under **ROLES:**

* 1. **t-Test:** choose what type of T-Test you are performing. For this tutorial: **Paired test**
	2. **Group 1 variable**. For this tutorial: **Gross Sales**
	3. **Group 2 variable**. For this tutorial: **Net Sales**

­­­Under **Group 1 variable**,

1. Click on the **+** sign

A new window will open,

1. Select **Gross Sales**
2. Click **OK**.

Under **Group 2 Variable**,

1. Click on the **+** sign

In the new window that opened,

1. Select **Net Sales**
2. Click **OK**

Note that once you have set both group variables, the red text that required you to insert variables disappeared and code is automatically created to the right.

## Step 4: Modify Settings

Once you have selected your dataset and variables, you can move to the **Options** tab where you can modify settings such as the type of test you want to perform and the alternative hypothesis value you are testing for.

1. Click on the **OPTIONS** tab

Under **TESTS** you will find four settings you can change:

* 1. **Tails**
	2. **Alternative Hypothesis: mu1 – mu2 ^ =**
	3. **Normality Assumption**
	4. **Nonparametric Tests**

For **Tails:**,

1. Select **Two-tailed test** from the dropdown menu

Keep the other settings as default.

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 **t-Test** 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

Under **Results**, notice that you have a folder named **The Ttest Procedure** which expands into a **Gross Sales – Net Sales** folder**.** Inside this folderyou can find the outputs broken down by sections.

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

Statistics Table:

Confidence Limits Table:

T-Tests Table:

Summary Panel plot:

Profiles plot:

Agreement Plot Visual:

Q-Q Plot:

Using this information (e.g. p-value, and Q-Q Plot of our variable), we can accept or reject our null hypothesis.

Congratulations, you have successfully performed a paired sample t-test in SAS Studio!