



Build a Dashboard Application with Plotly Dash

In this lab, you will be building a Plotly Dash application for users to perform interactive visual analytics on SpaceX launch data in real time.

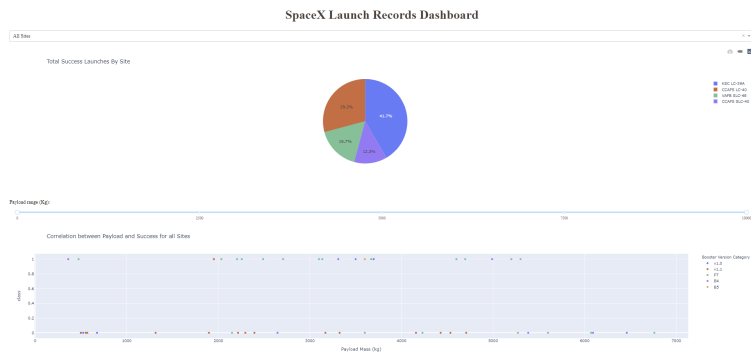
This dashboard application contains input components such as a dropdown list and a range slider to interact with a pie chart and a scatter point chart. You will be guided to build this dashboard application via the following tasks:

- TASK 1: Add a Launch Site Drop-down Input Component
- TASK 2: Add a callback function to render success rate chart based on selected site dropdown
- TASK 3: Add a Range Slider to Select Payload
- TASK 4: Add a callback function to render the success rate scatter chart scatter plot

Note: Please take screenshots of the Dashboard and save them. Further upload your notebook to github.

The github url and the screenshots are later required in the presentation slides.

Your completed dashboard application should look like the following screenshot:



After visual analysis using the dashboard, you should be able to obtain some insights to answer the following five questions:

- Which site has the largest successful launches?
- Which site has the highest launch success rate?
- Which payload range(s) has the highest launch success rate?
- Which payload range(s) has the lowest launch success rate?
- Which PP Booster version (v1.4, v1.1, v1.1, v1.1, etc.) has the highest launch success rate?

Estimated time needed: 90 minutes

Important Notice about this lab environment

Please be aware that sessions for this lab environment are not persisted. When you launch the Cloud IDE, you are presented with a 'dedicated computer on the cloud' exclusively for you. This is available to you as long as you are actively working on the labs. Once you close your session or it is timed out due to inactivity, you are logged off, and this entire computer or the cloud is deleted along with any files you may have created, downloaded or installed.

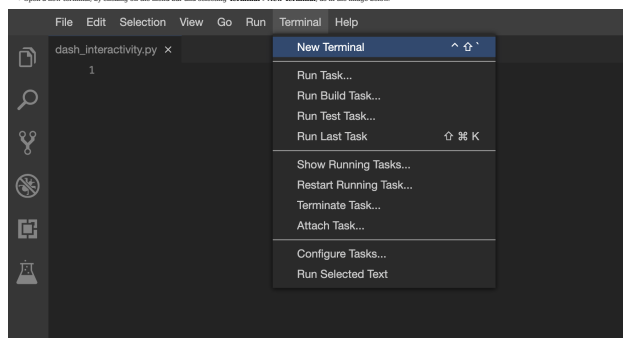
The next time you launch this lab, a new environment is created for you.

If you finish only part of the lab and return later, you may have to start from the beginning. So, it is a good idea to plan your time accordingly and finish your labs in a single session.

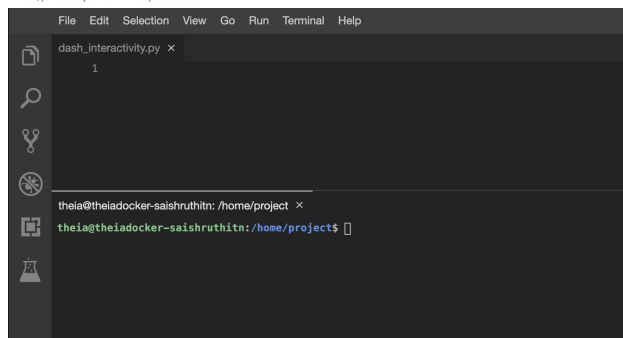
Setup development environment

Install required Python packages

- Open a new terminal, by clicking on the menu bar and selecting **Terminal** > **New Terminal**, as in the image below.



- Now, you have script and terminal ready to start the lab.



- Install python packages required to run the application.

Copy and paste the below command to the terminal.

- ```
1. 1. python3 -m pip install plotly dash
```

Copy



• pie chart visualizing launch success counts.

Dash callback function is a type of Python function which will be automatically called by Dash whenever receiving an input component updates, such as a click or dropdown selecting event.

If you need to refresh your memory about Plotly Dash callback functions, you may refer to the link you have learned before:

[Plotly Dash Link](#)

Let's add a callback function in `spaces.py` including the following application logic:

- Input is set to be the site dropdown, i.e., `Input(component_id='site-dropdown', component_property='value')`
- Output to be the graph with id `success-pie-chart`, i.e., `Output(component_id='success-pie-chart', component_property='figure')`
- A `if` statement to check if ALL sites were selected or just a specific launch site was selected
  - If ALL sites are selected, we will use all rows in the dataframe `space`, or to render and return a pie chart graph to show the total success launches (i.e., the total count of `class` column)
  - If a specific launch site is selected, you need to filter the dataframe `space`, or first in order to include the only data for the site selected site
- Then, render and return a pie chart graph to show the success (`success`) count and failed (`failure`) count for the selected site.

Here is an example of a callback function:

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The rendered pie chart should look like the following screenshot:

- Pie chart for all sites are selected



- Pie chart for is selected



If you need more reference about dash callbacks and plotly pie charts, refer to the [Plotly Dash Reference](#) towards the end of this link.

### TASK 3: Add a Range Slider to Select Payload

Next, we want to find if variable payload is correlated to mission outcome. From a dashboard point of view, we want to be able to easily select different payload range and see if we can identify some visual patterns.

Find and complete a commented `cc_payload_slider` input with the following attribute:

- id to be `payload_slider`
- min indicating the slider starting point, we set its value to be 0 (Kg)
- max indicating the slider ending point to, we set its value to be 10000 (Kg)
- step indicating the slider interval on the slider, we set its value to be 1000 (Kg)
- value indicating the current selected range, we could set it to be `cc_payload` and `max_payload`

Here is an example of `cc_payload_slider`:

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