## The below contains an explanation of my thinking at each step and the steps and errors I took throughout the process.

1. Pull current data for all cryptocurrencies using the [CoinMarketCap API](https://coinmarketcap.com/api/" \t "_blank)

**Since this challenge requires a data ingestion script to pull cryptocurrency data from an API and has to be located inside the Google Datalab notebook, I will have to write Python code to call the API and retrieve the crypto currency dataset.**

**Steps:**

* **Create an account on CoinMarketCap API to get my unique API key.**
* **Read through the** [**API documentation**](https://coinmarketcap.com/api/documentation/v1/) **to determine how to retrieve the crypto currency dataset.**
* **Start a datalab notebook (step 5).**
* **Write the code in Python to retrieve the dataset from the CoinMarketCap API.**

1. Save this data as a CSV file

**The dataset is in JSON format and has to be converted to CSV. I had originally tried to convert the data from JSON to CSV using a CSV writer but it did not output correctly since the file contains nested JSON data. To flatten the JSON dataset I used the Python pandas** [**json\_normalize**](https://pandas.pydata.org/pandas-docs/version/0.22/generated/pandas.io.json.json_normalize.html) **function to flatten the data and saved the output as a CSV file using the dataframe to\_csv pandas function.**

1. Upload the CSV to a Google Cloud Storage Bucket

**I had attempted to use the** [**datalab storage module**](https://googledatalab.github.io/pydatalab/google.datalab.storage.html) **to upload the CSV file from the notebook into a GCS bucket but was unable to find a simple way to do so. Instead I created a Python script on my local machine that utilizes the google.cloud.storage module to both create a bucket and upload the CSV file to that bucket.**

**In order to work with Google Cloud on my local machine, I first created a service account and set my local environment variable which will allow me to interact with Google Cloud using the guide** [**here**](https://cloud.google.com/docs/authentication/getting-started)**. Next I installed the proper Google Cloud libraries and followed the GCS Python API** [**documentation**](https://cloud.google.com/storage/docs/reference/libraries) **to upload the CSV file onto GCS.**

1. Move cryptocurrency data from GCS bucket to BigQuery

**Following the BigQuery Python API** [**reference**](https://cloud.google.com/bigquery/docs/reference/)**, I created a second Python script to move the CSV file from GCS to BigQuery using the API. This script also loads the CSV file with the proper formatting so that it can be loaded into a BigQuery table.**

1. Create a Google Datalab notebook instance

**Following the** [**quick start guide**](https://cloud.google.com/datalab/docs/quickstart) **for Datalab, I started a Datalab instance by using the Google Cloud Shell. I created a Datalab instance by entering the command “*datalab create datalab-instance-dennis-caserta*”. I am able to connect to the Datalab instance once it is successfully created.**

1. Execute these five queries inside the notebook:
2. How many coins have a USD price greater than $8,000?

**This is a count and a filter on crypto currencies where the USD\_price > than $8000.**

1. What is the total market cap of the top 100 cryptocurrencies (in USD)?

**Assuming this is the top 100 crypto currency based on the CMC rank column, it is a sum of the market\_cap column where the CMC rank is =<. If this is a total market cap of the top 100 cryptocurrencies by market cap, then I would have added an order by market\_cap desc into the query and limit it to the first 100.**

1. Which coins have an available supply less than $5M?

**Since this is asking which coin has an available supply of less than 5M, the circulating\_supply will be able to provide us with the available count. I can filter out coins with a circulating supply of less than 5 million.**

1. Which 5 coins have seen the greatest percentage growth in the last week?

**The percent\_change\_7d column provides us with the list. I can order this column in descending order and limit it to the first 5 records.**

1. How many ticker symbols contain the letter "X" ?

**This utilizes the like functionality in SQL to see how many coins have an “X” in the ticker symbol.**

1. Download the notebook as a .ipynb file by choosing correct option under "Notebook" on the top left

**Ensure that my downloaded .ipynb file can be reloaded back into the notebook.**

1. Email deliverables back to recruiter