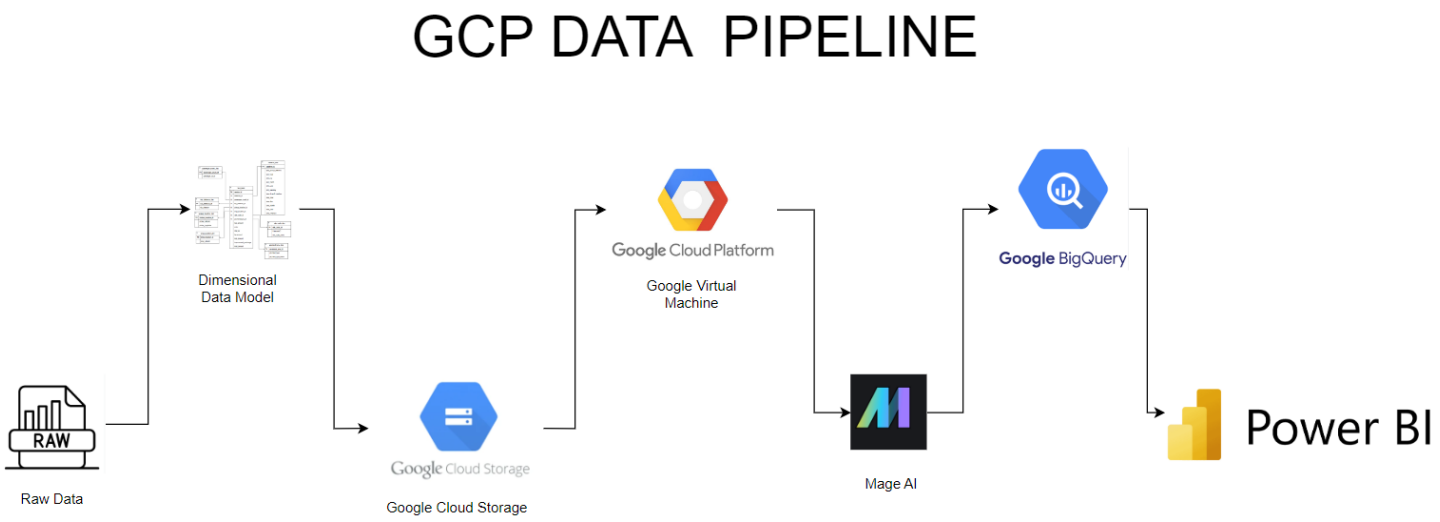


Here I present the end-to-end Google Data Pipeline which I created to analyse the Uber data and visualize it on a Power BI Dashboard.

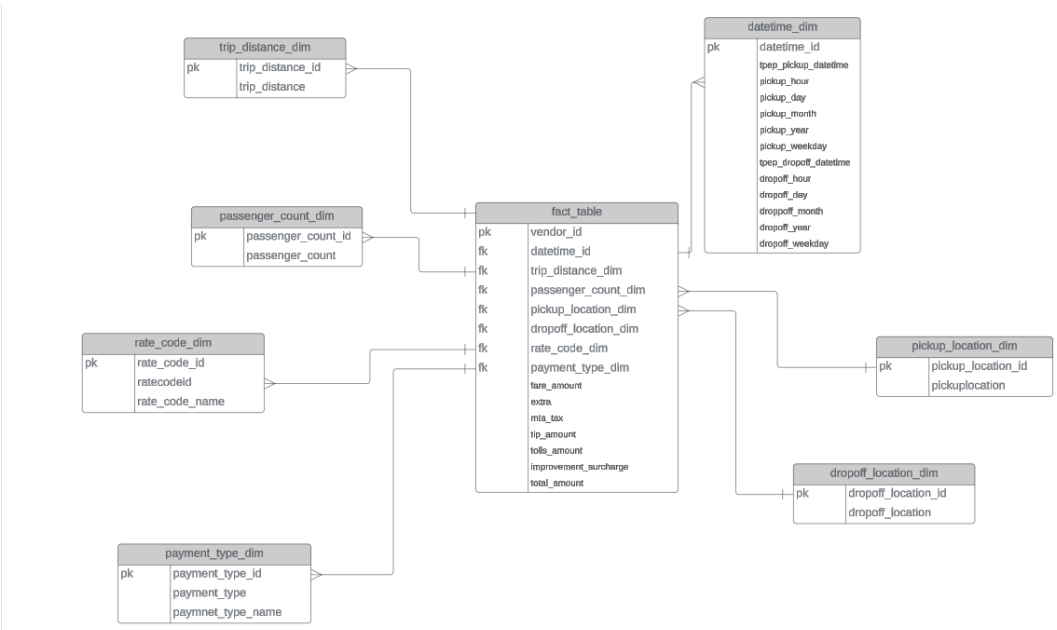
The resources and Tools I used are -
Raw data –Acquired the Raw data through open source portals
Draw.io-Used Draw.io to perform Dimensional modelling of the data
Google Cloud Storage –To store the raw
Google Virtual Machine-To gain the computing efficiency
Mage AI – To create data pipeline
Google BigQuery- To Query the data and make relations
Power BI-To make visualization on the insights gathered on BigQuery

Let’s first explore the data which we have

	VendorID	tpep_pickup_datetime	tpep_dropoff_datetime	passenger_count	trip_distance	pickup_longitude	pickup_latitude	RatecodeID	store_and_fwd_flag
0	1	2016-03-01	2016-03-01 00:07:55	1	2.50	-73.976746	40.765152	1	N
1	1	2016-03-01	2016-03-01 00:11:06	1	2.90	-73.983482	40.767925	1	N
2	2	2016-03-01	2016-03-01 00:31:06	2	19.98	-73.782021	40.644810	1	N
3	2	2016-03-01	2016-03-01 00:00:00	3	10.78	-73.863419	40.769814	1	N
4	2	2016-03-01	2016-03-01 00:00:00	5	30.43	-73.971741	40.792183	3	N

Based on the Data I had I created a Dimensional Model of the data on Draw.io .

Here is the Dimensional Model I created



The dimension model (Star Schema) had

1. fact table

2. pickup location table

3. dropoff location table

4. passenger count

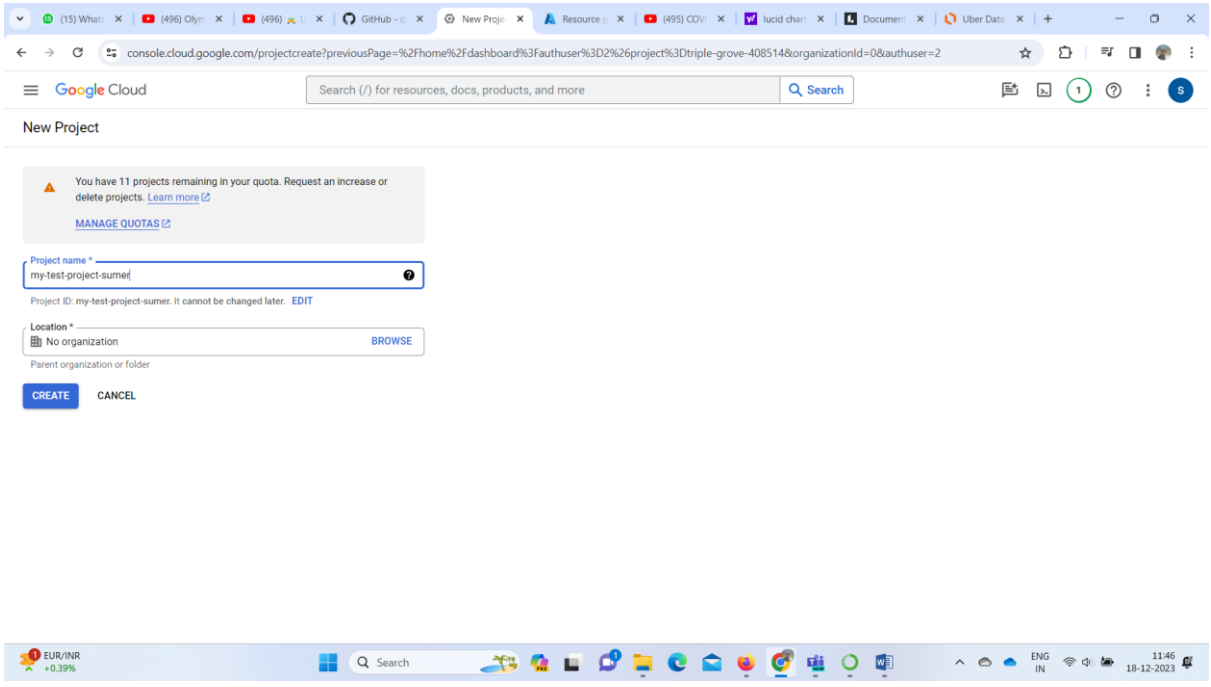
5.trip distance

6.date time

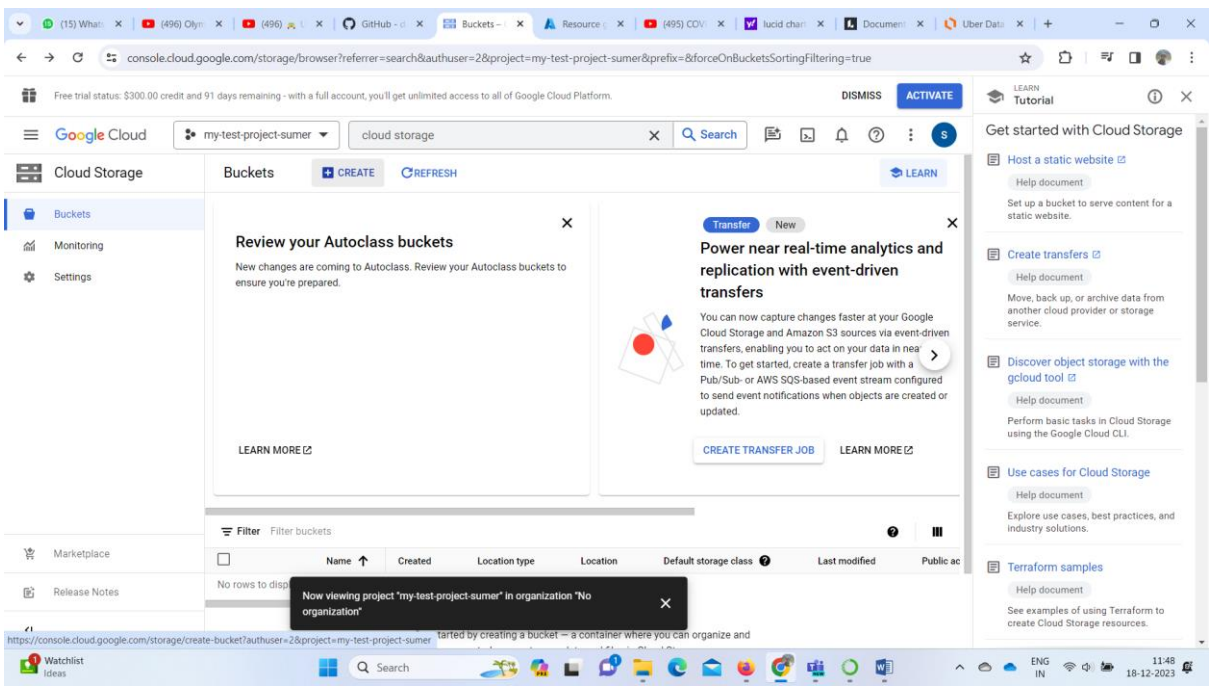
7.rate code type

8.payment type

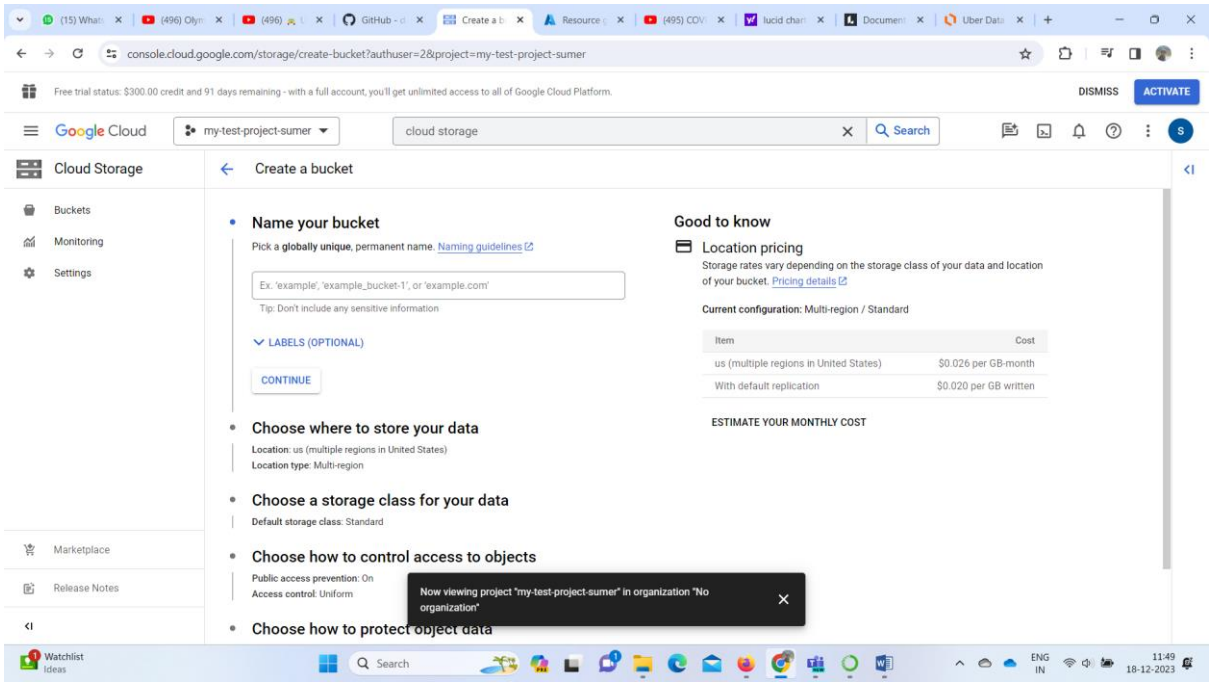
Once we had made our Star schema Data warehouse ,I was ready to login to my GCP console.
The first step was create a project

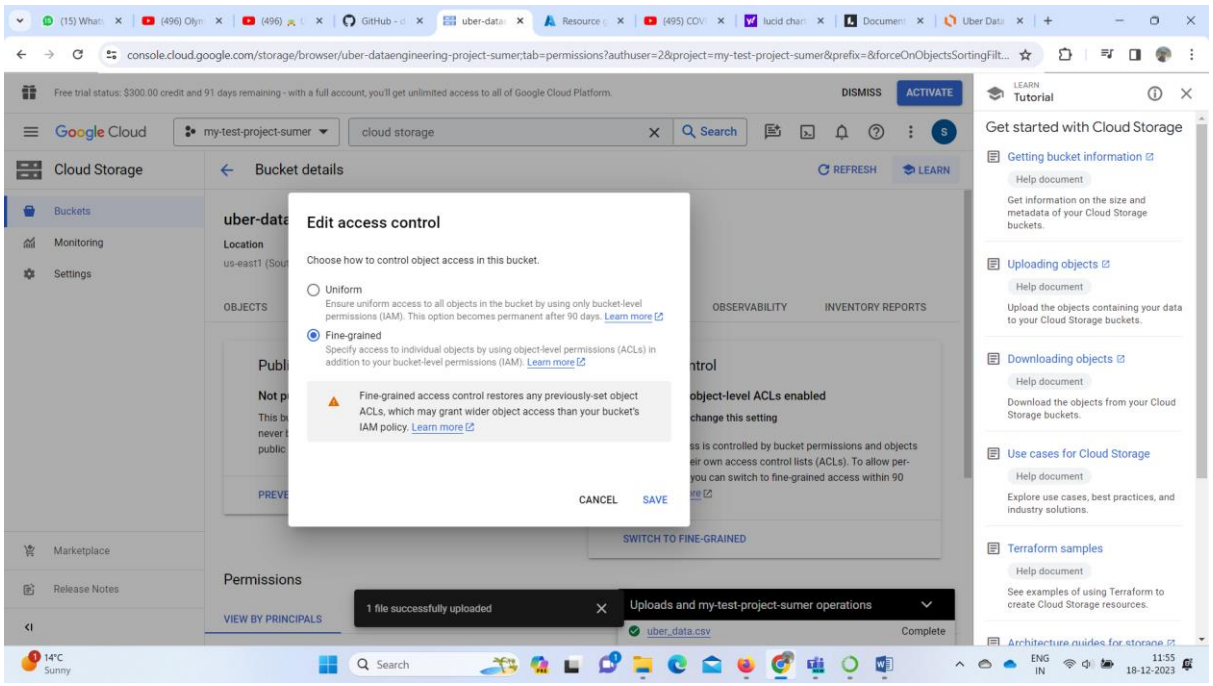


Once we are done creating the new project ,let’s create a new bucket to store our data

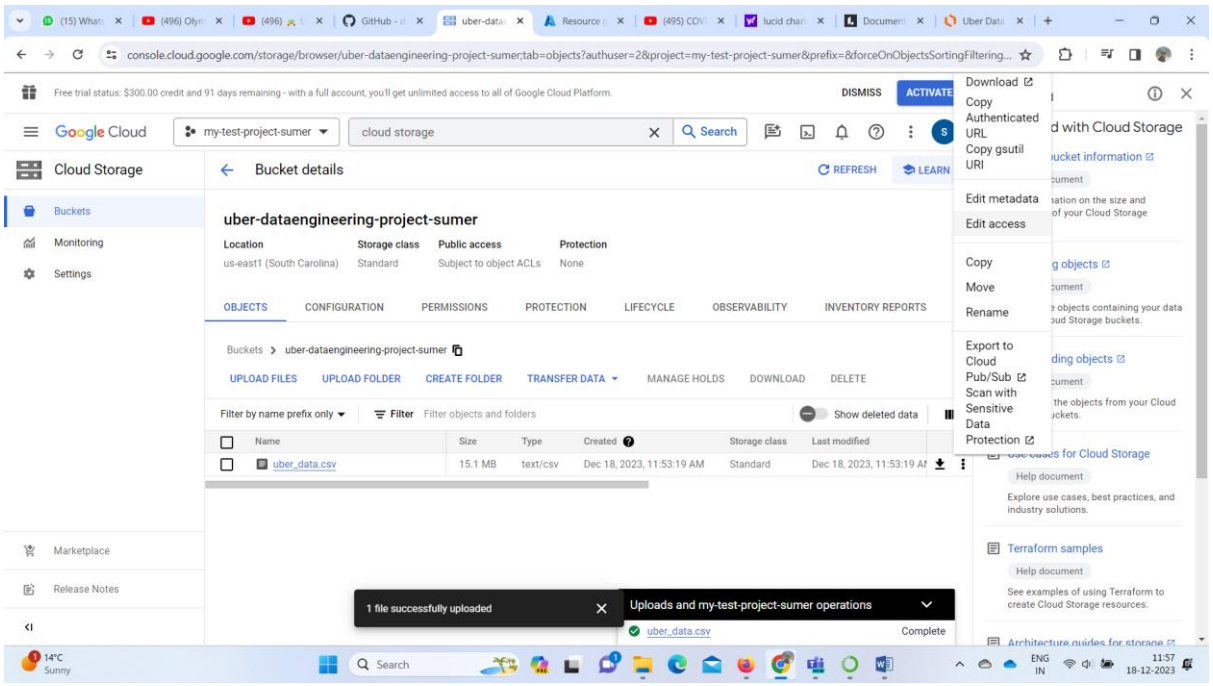


Give a name to your ,select the region .Remember to enable public access of your storage to get the URL of the data I your storage and edit the access to Fined grained

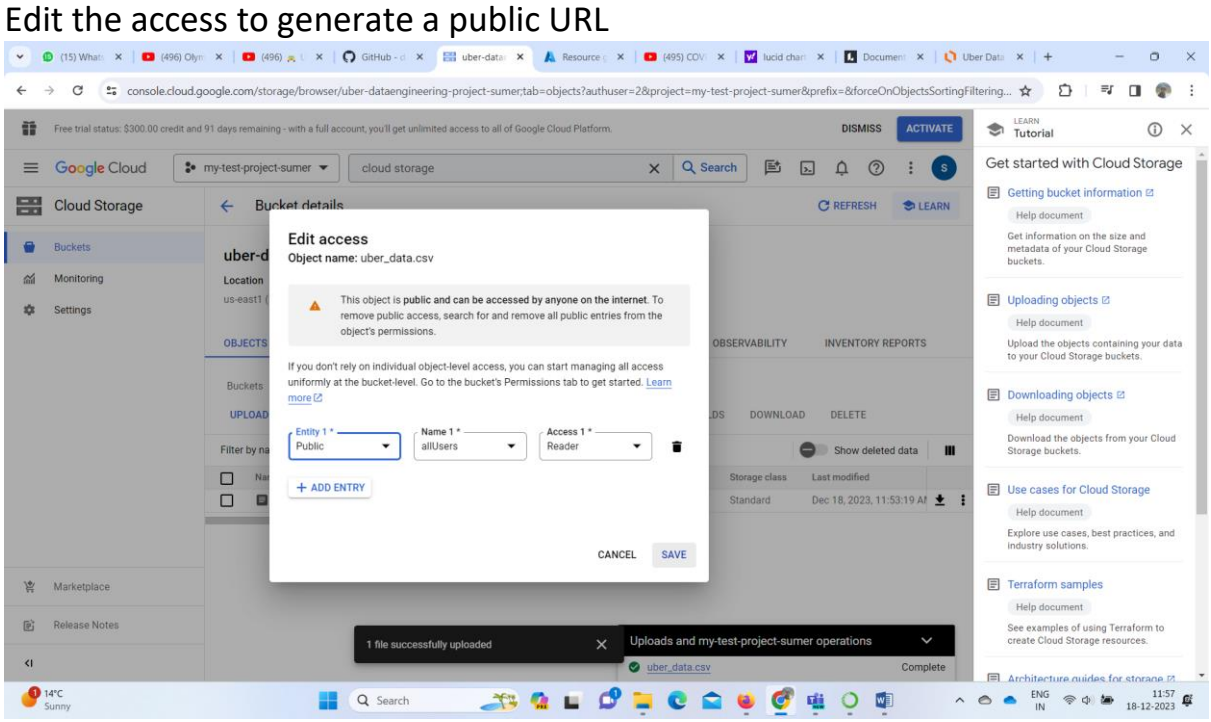




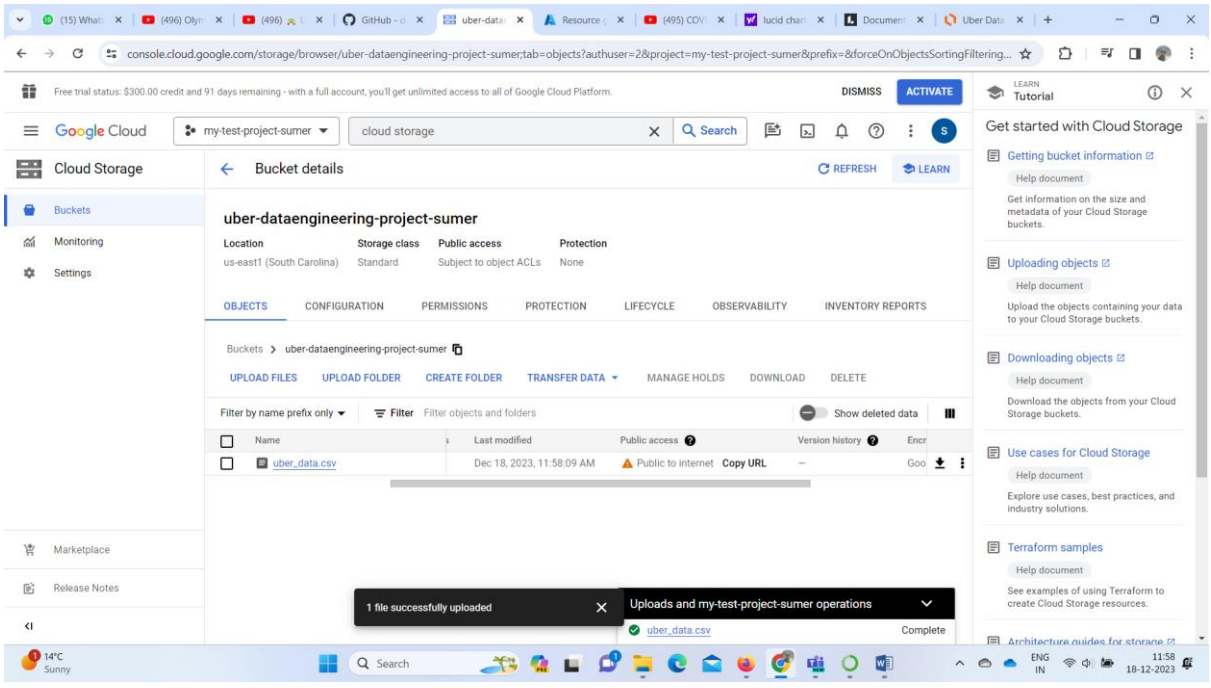
We have created the bucket



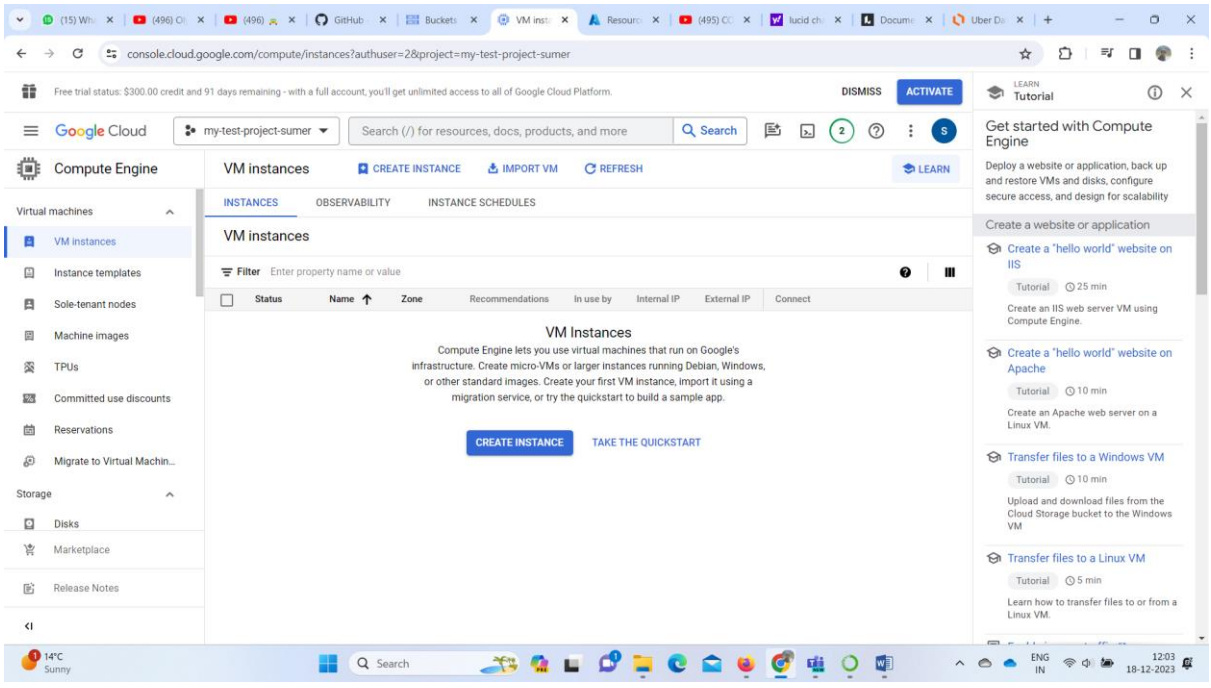
Edit the access to generate a public URL



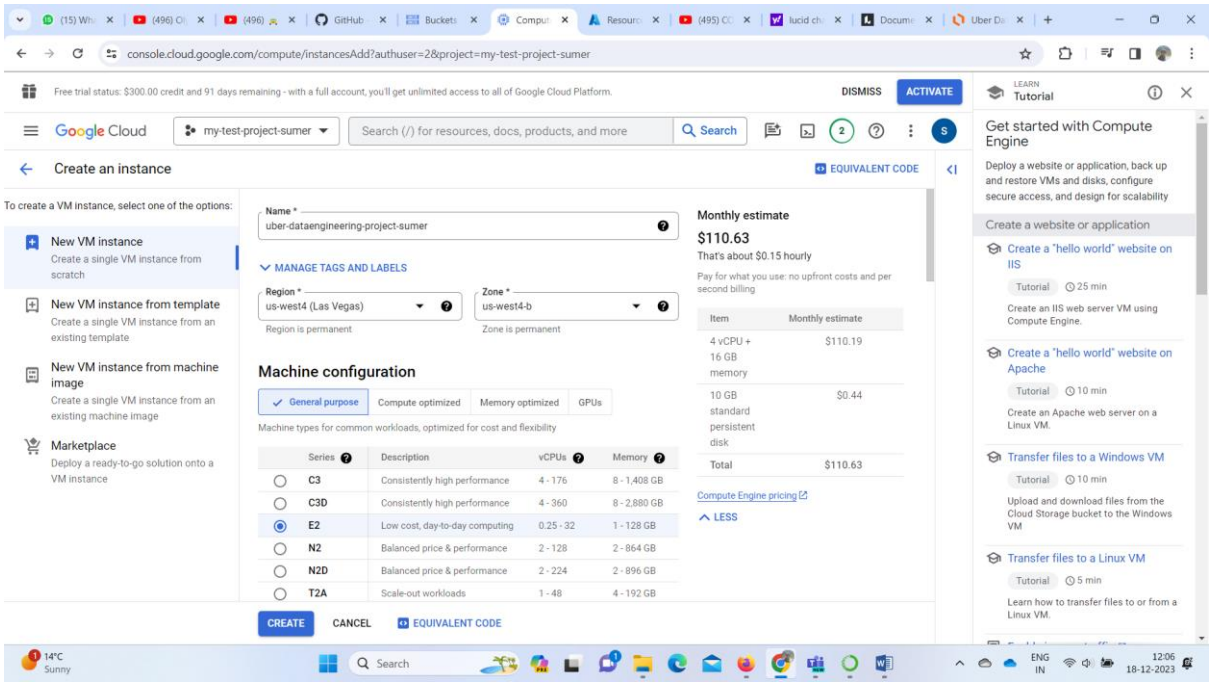
Upload the CSV in the bucket

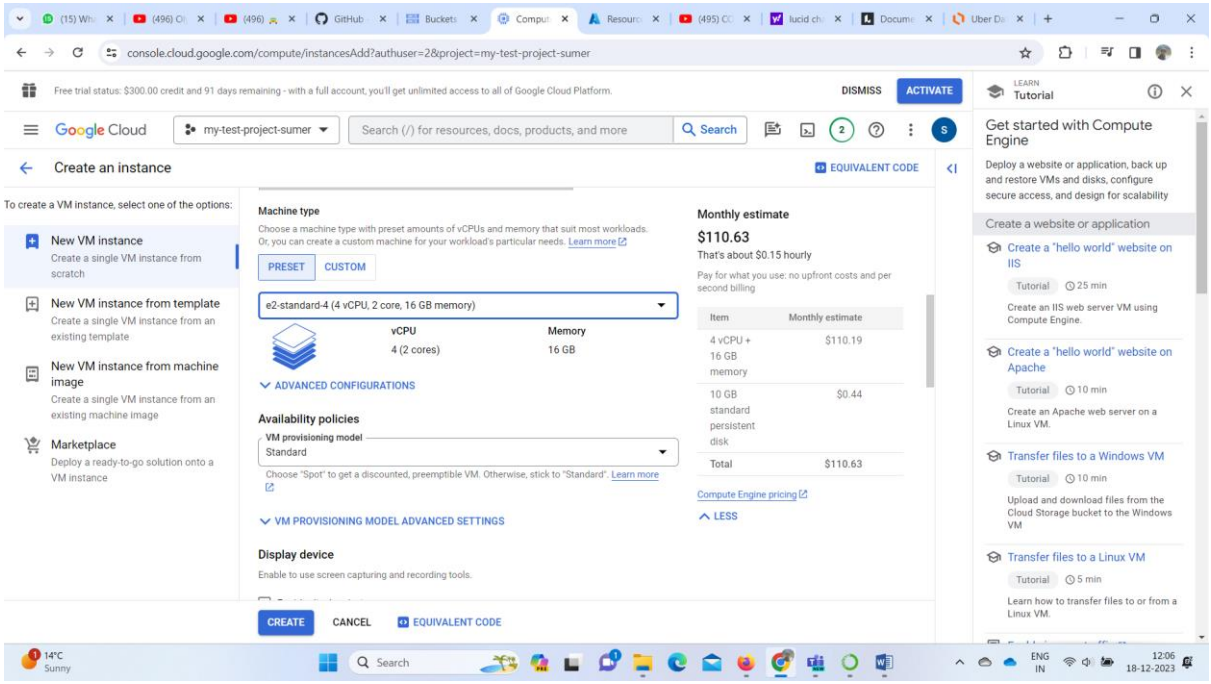


Now Let's Start with the compute Engine .Search for google compute engine in the search box .Then create a new instance .

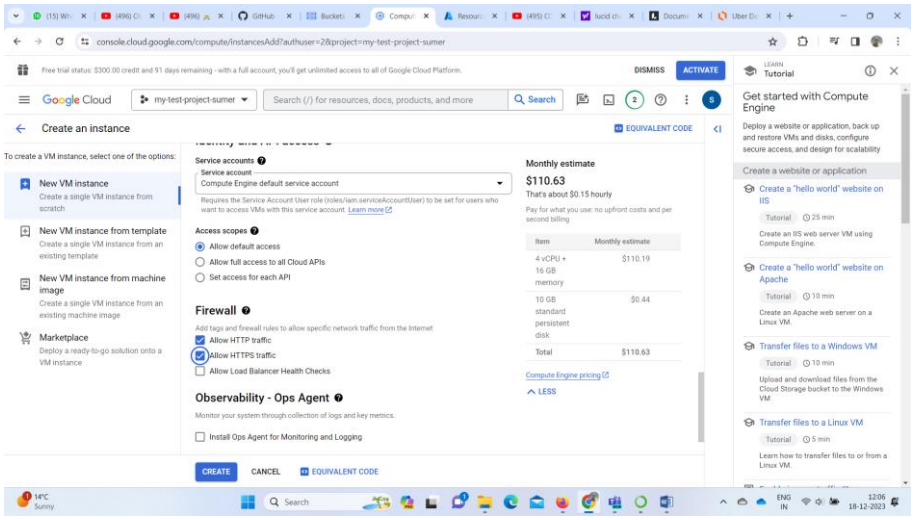


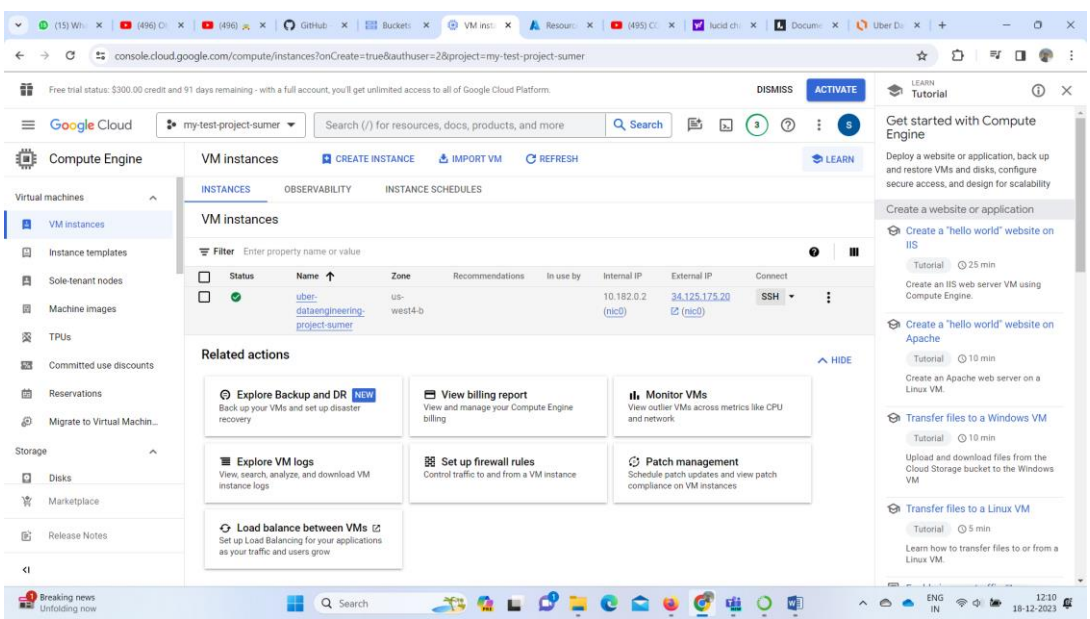
Give a name to your instance ,select the region and the machine configurations



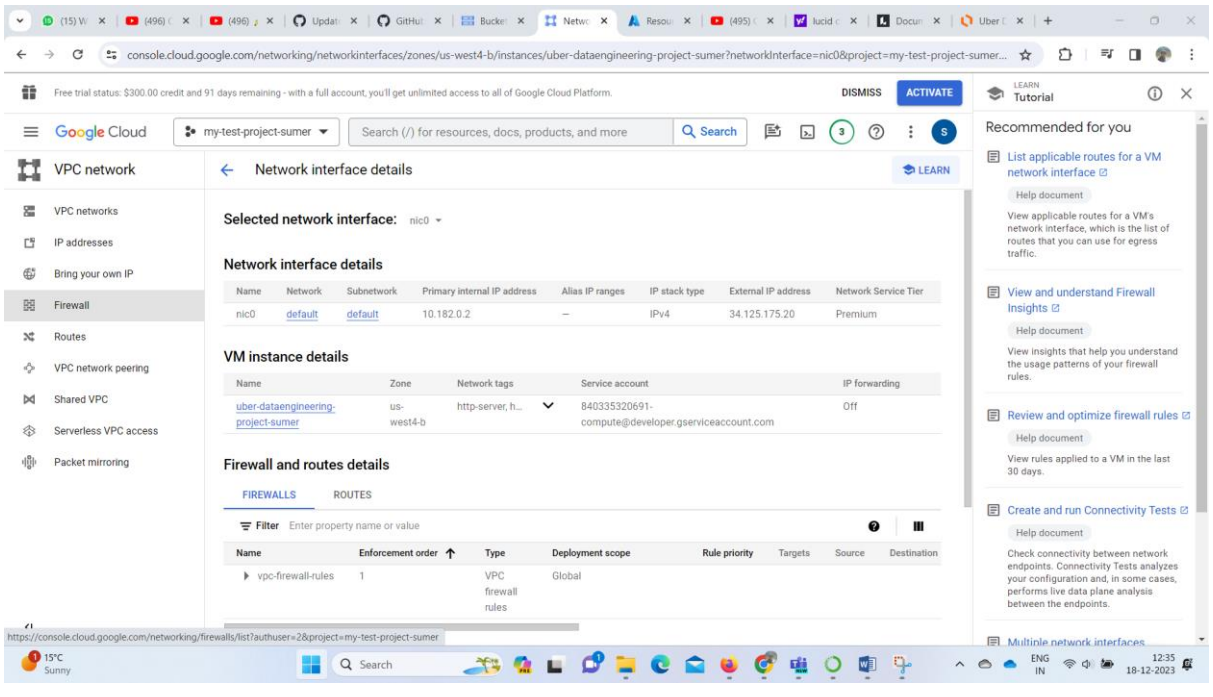


Allow the HTTP and HTTPS inbound traffic and create the machine .

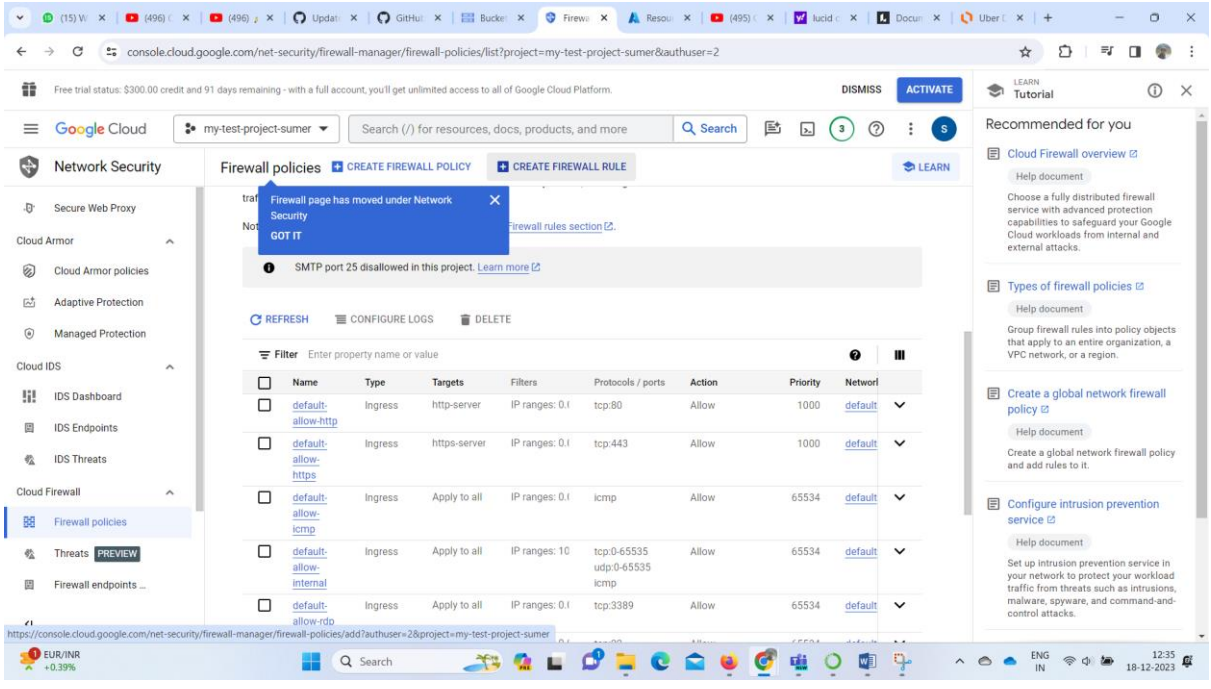




Now let’s edit the Firewall rule of the instance to be able to connect to mage ai .to to the firewall pane ,click on ‘nic0’.



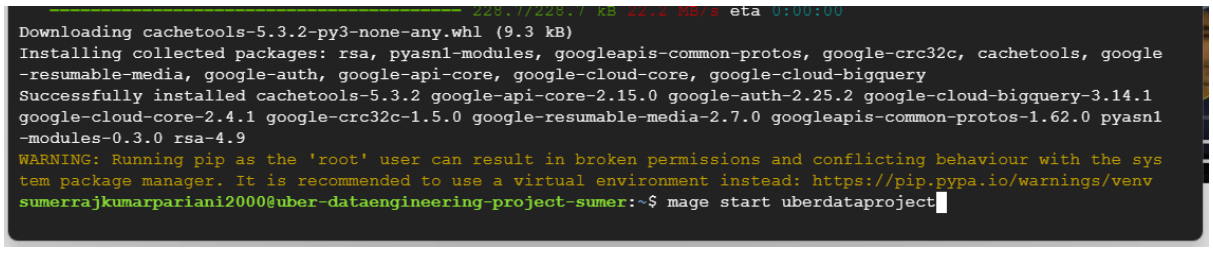
And allow TCP port 6789(mageai port) under the inbound rules



now let’s work on our newly constructed instance ,by clicking on SSH
Install the important packages and mage on our new instance .Below is the code for that

```
# Install Python and pip

sudo apt-get install update

sudo apt-get update


sudo apt-get install python3-distutils


sudo apt-get install python3-apt

sudo apt-get install wget

wget https://bootstrap.pypa.io/get-pip.py

sudo python3 get-pip.py

# Install Mage

sudo pip3 install mage-ai

# Install Pandas

sudo pip3 install pandas

# Install Google Cloud Library

sudo pip3 install google-cloud

sudo pip3 install google-cloud-bigquery
```

Once mage is pip installed we have to start mage with a name of the project

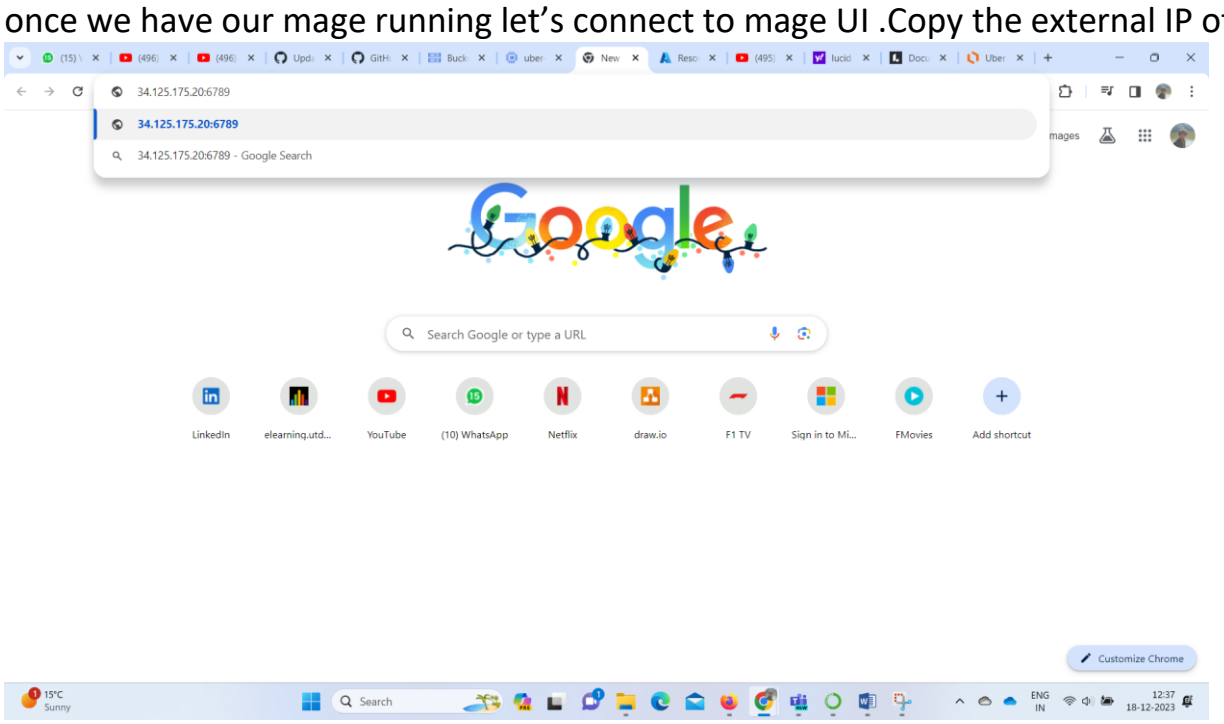


This will give you a port number on which the mage instance is working

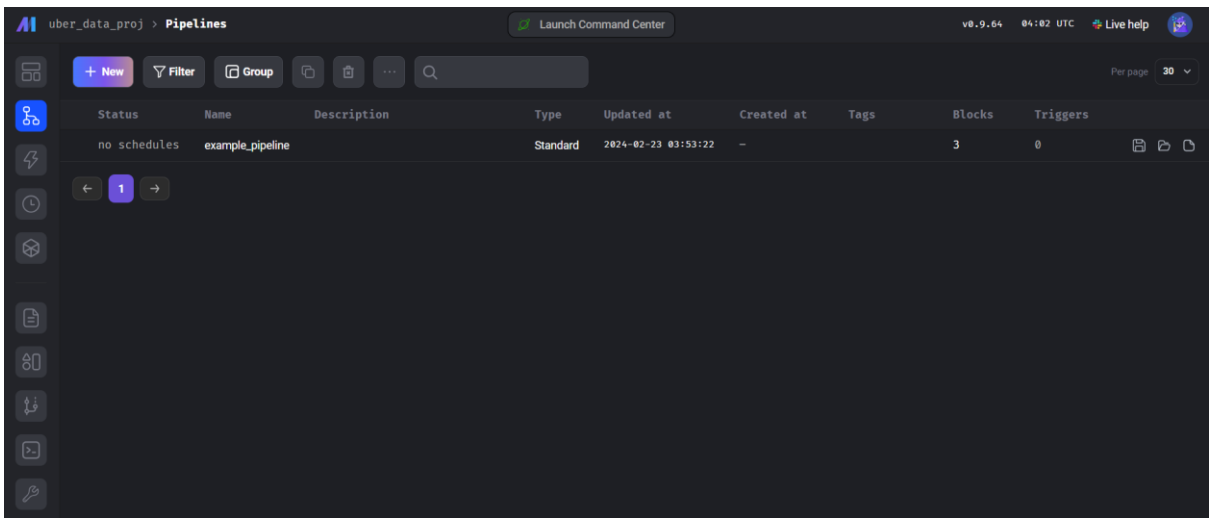
port 6789

```
ation tables
Checking port 6789...
INFO  [alembic.runtime.migration] Running upgrade 643b6e65e814 -> 1f9353eddbc6, Add secrets table
INFO:mage_ai.server.server:Mage is running at http://localhost:6789 and serving project /home/sumerrajkumarpari
```

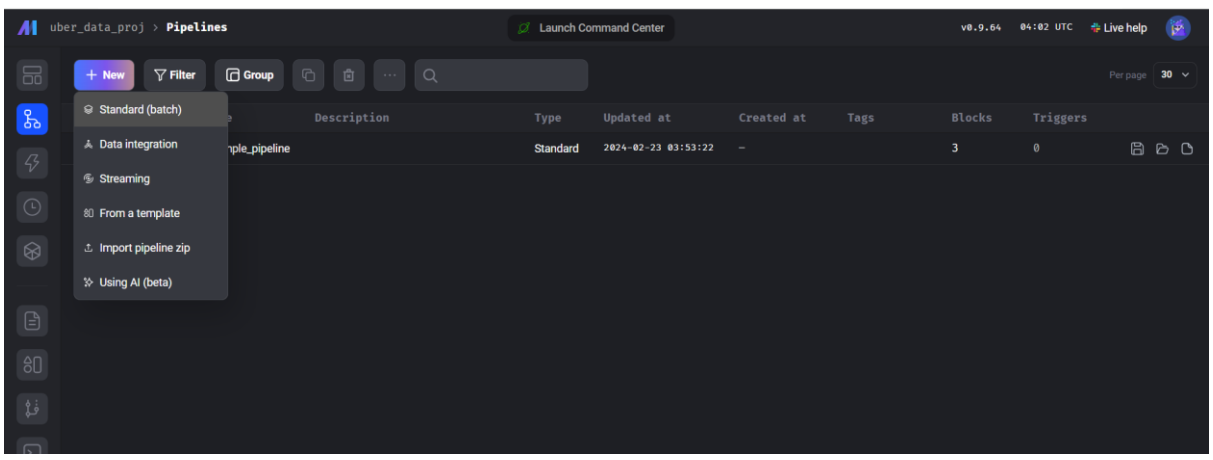
once we have our mage running let’s connect to mage UI .Copy the external IP of the instance and connect to the 6789 TCP port



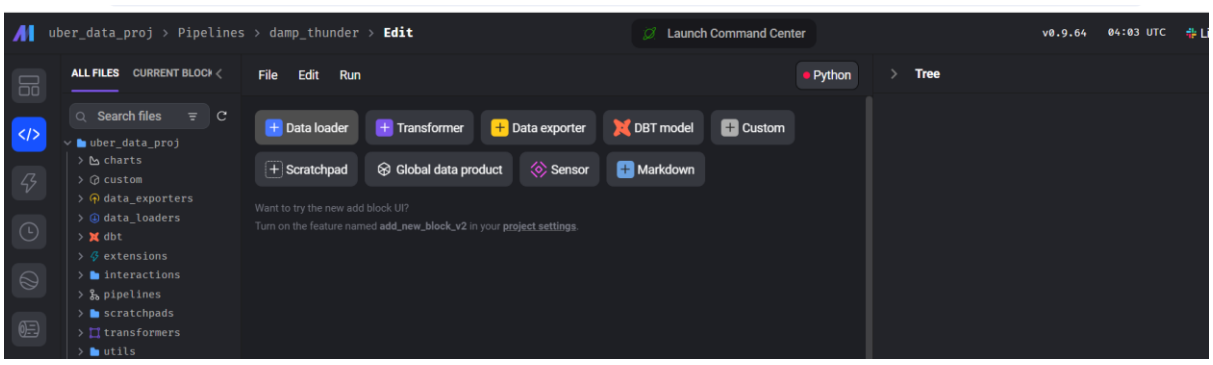
Here we are on our Mage UI



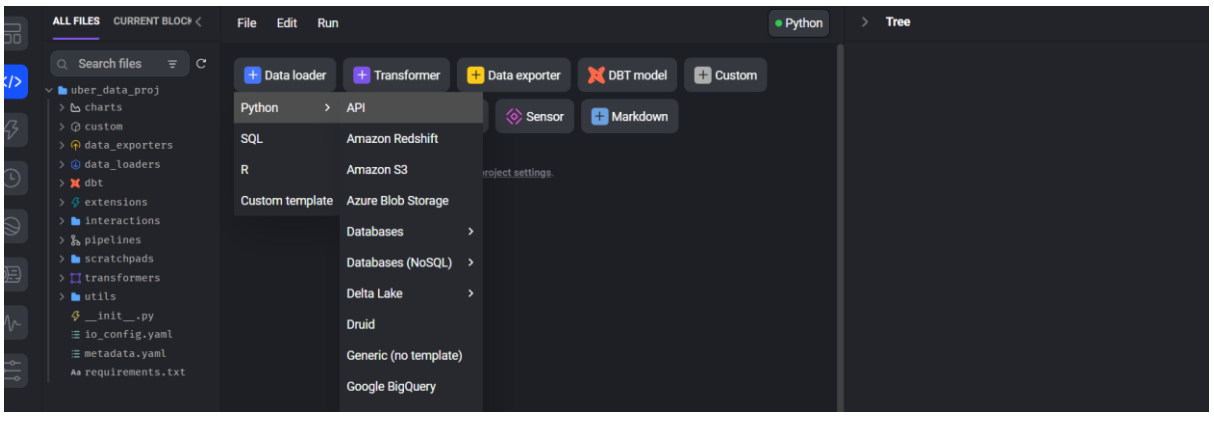
Start by creating a new standard (Batch Process)



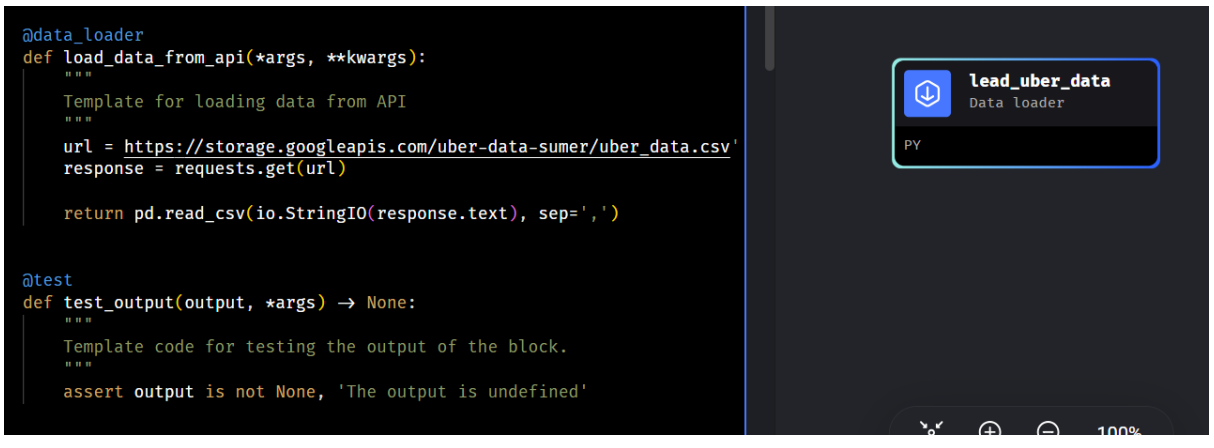
to load the Data click on the Data loader option



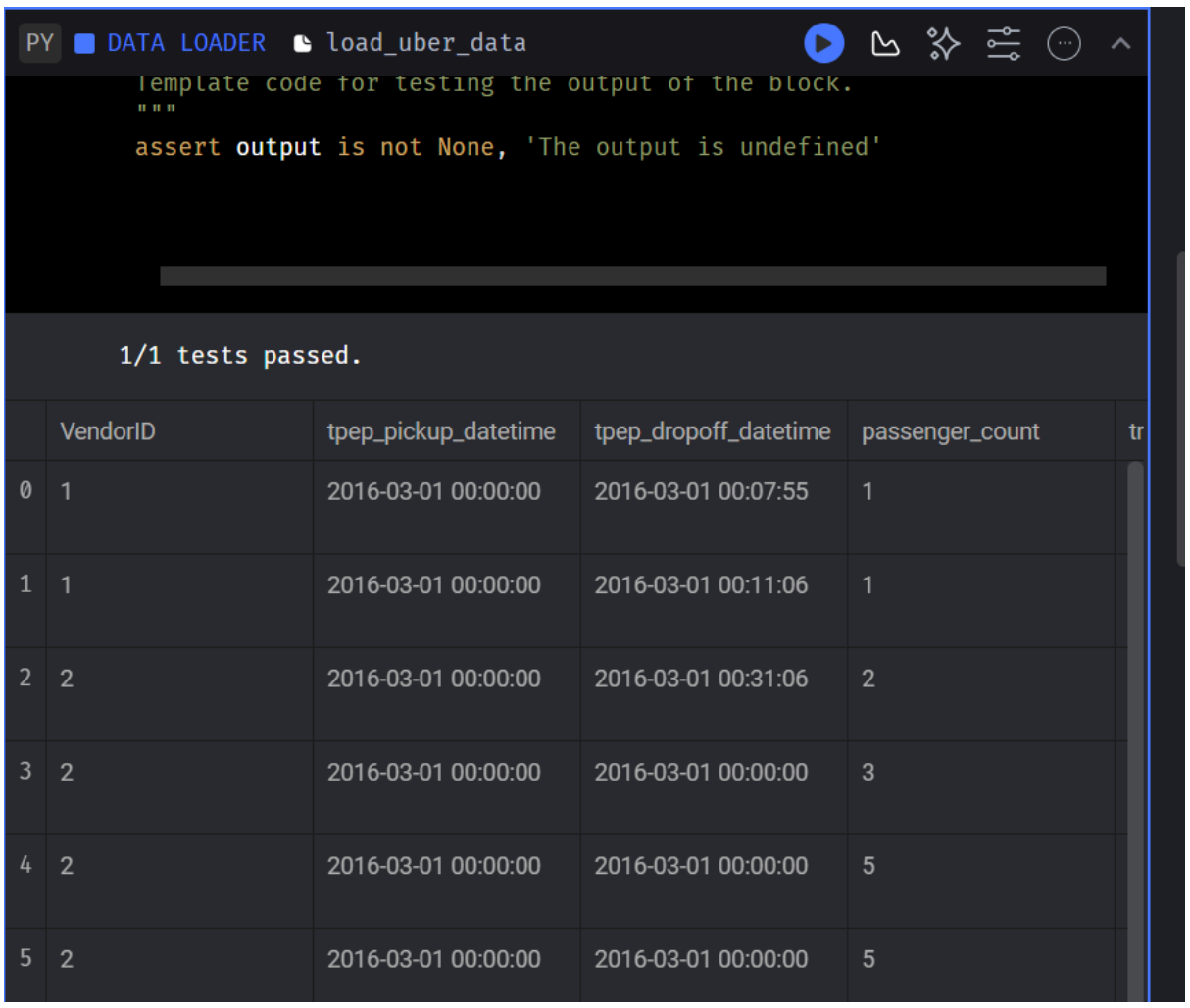
Select Python a language and then through API because we have the data in your google cloud storage .



copy the URL of the data in google cloud storage and paste it under data loader code of Mage UI



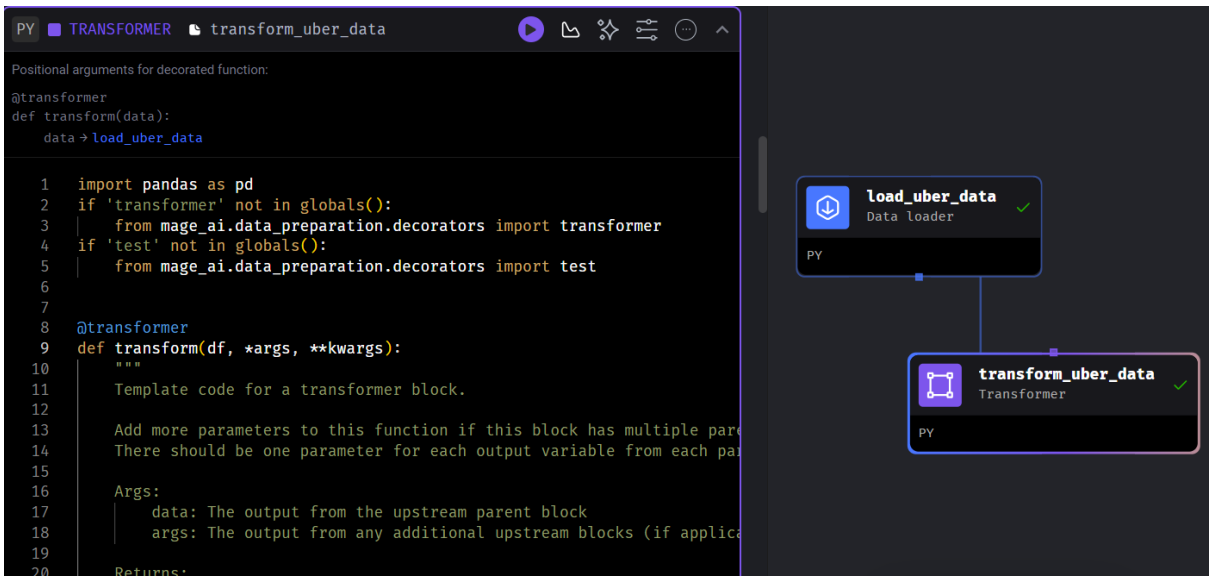
Run the code and access the data

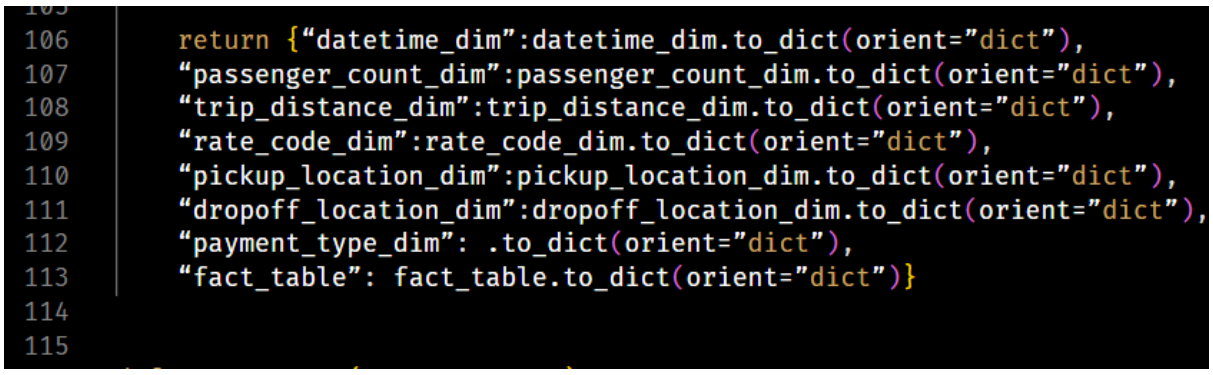


	VendorID	tpep_pickup_datetime	tpep_dropoff_datetime	passenger_count	tr
0	1	2016-03-01 00:00:00	2016-03-01 00:07:55	1	
1	1	2016-03-01 00:00:00	2016-03-01 00:11:06	1	
2	2	2016-03-01 00:00:00	2016-03-01 00:31:06	2	
3	2	2016-03-01 00:00:00	2016-03-01 00:00:00	3	
4	2	2016-03-01 00:00:00	2016-03-01 00:00:00	5	
5	2	2016-03-01 00:00:00	2016-03-01 00:00:00	5	

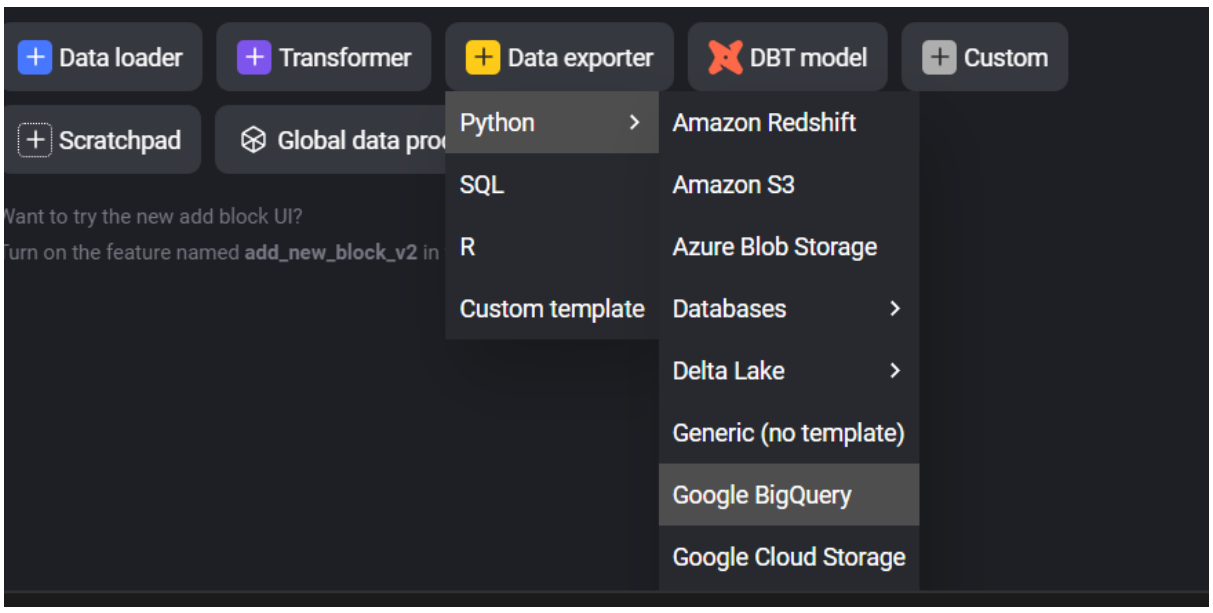
Now we move to the transformation park .Click on the transform option to open the mage code for transformation .Apply the transformation code in the section given there .Remember to return all the tables at the end .

To have provide my transformation code visit this Link -https://github.com/SumerPariani/GCP/blob/main/uber_data_analysis.ipynb



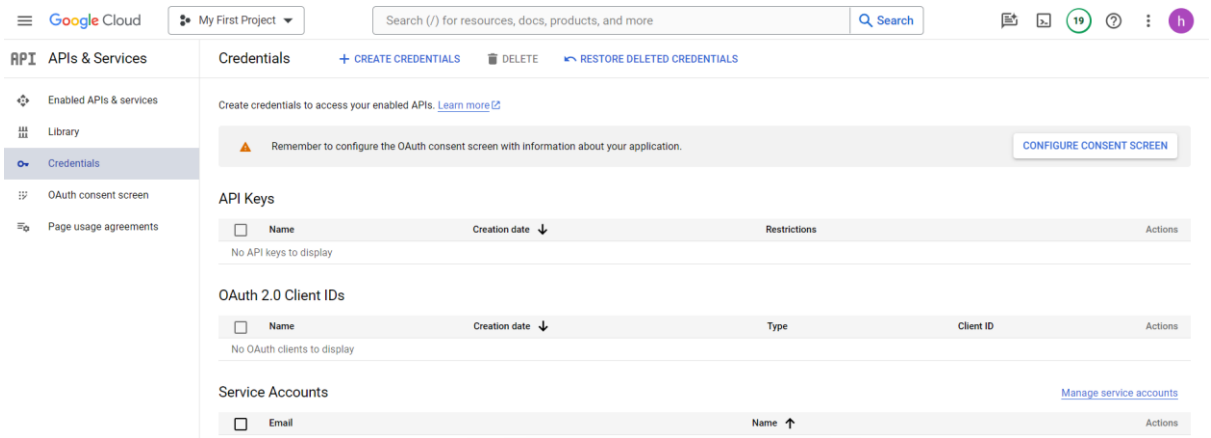


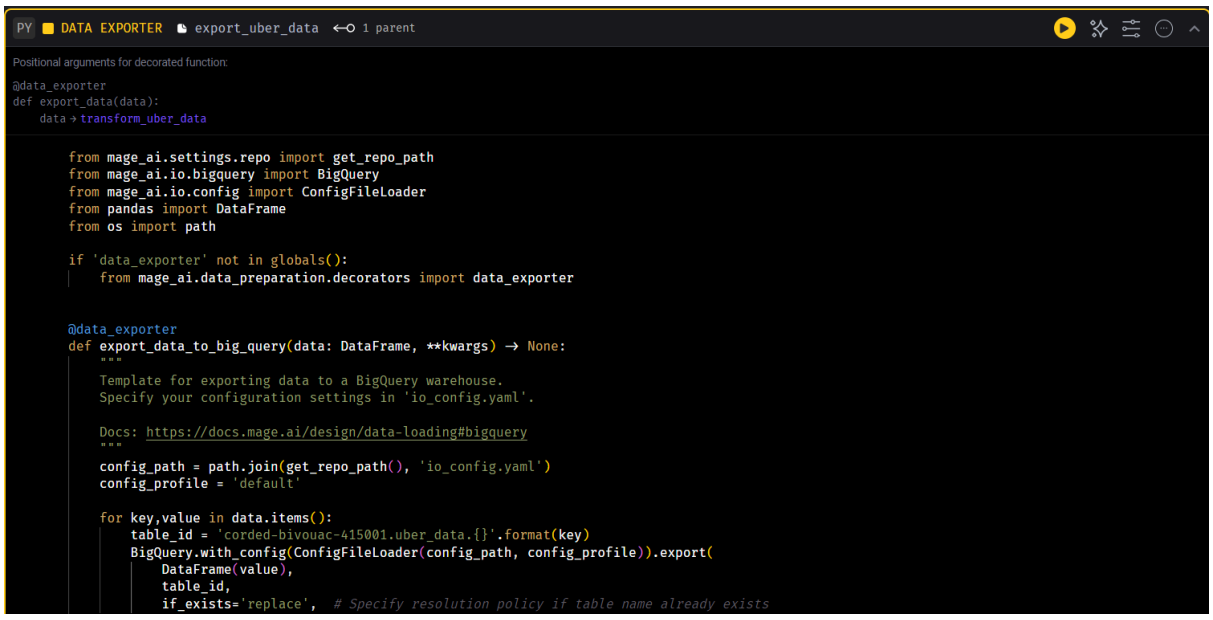
Now let’s move exporter part .We need to export the data to Google BigQuery to be able to perform querying on this data



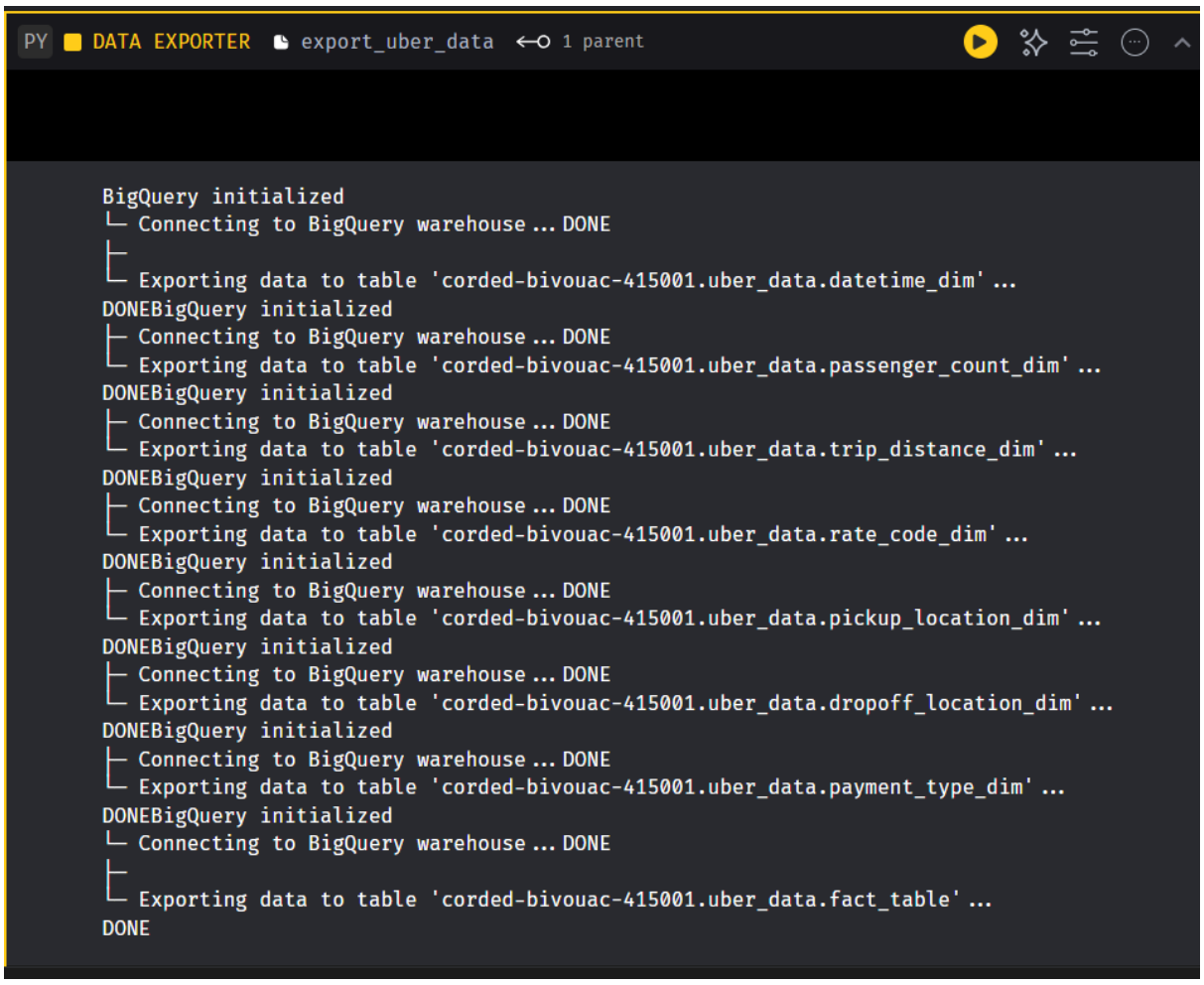
we need to provide credentials to the YAML.io file in MAGE UI to be able to connect with a Big query to generate the access credentials on google cloud console .

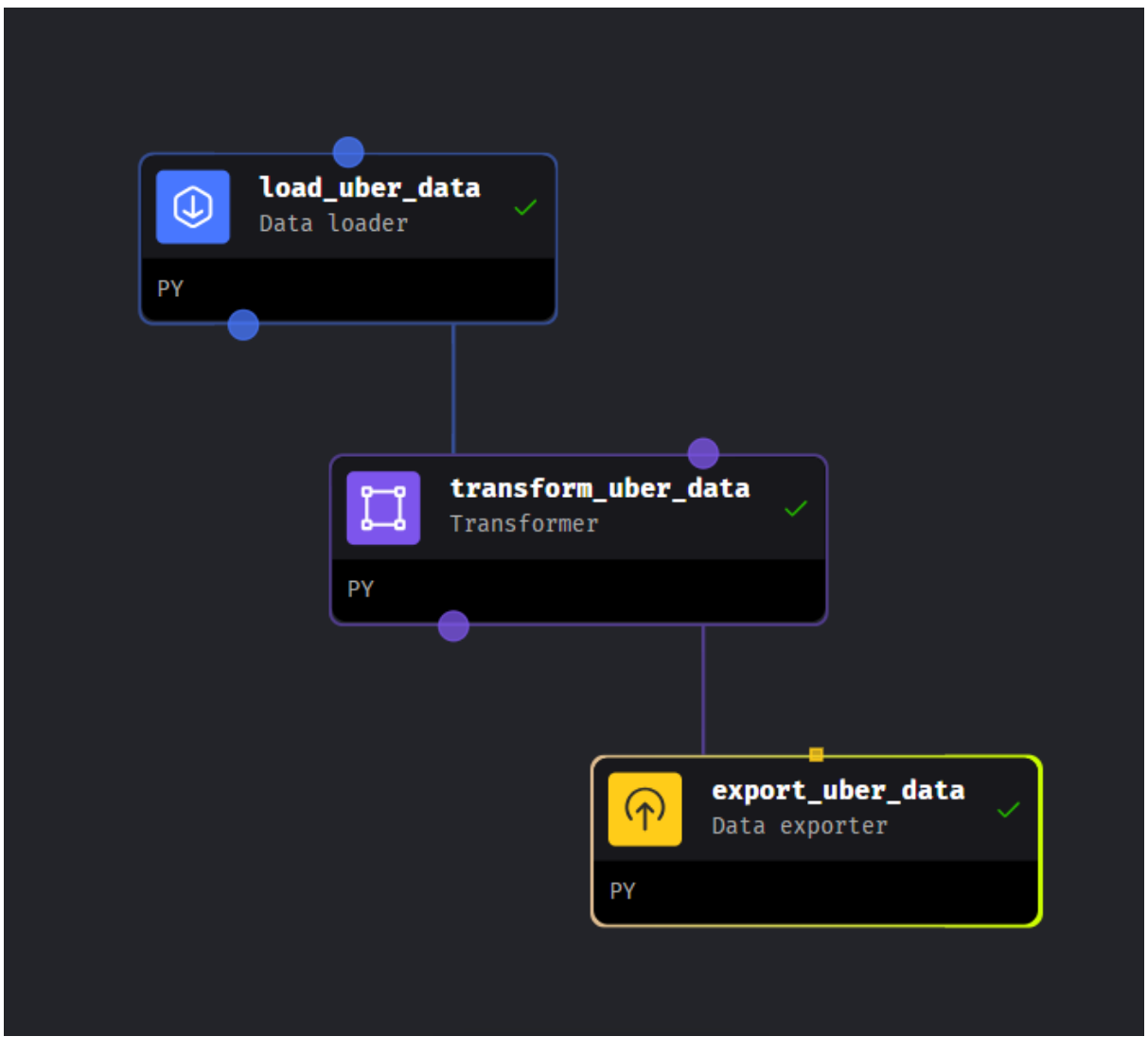
Go to API’s and services and the credentials pane .Click on create Credentials for service account option



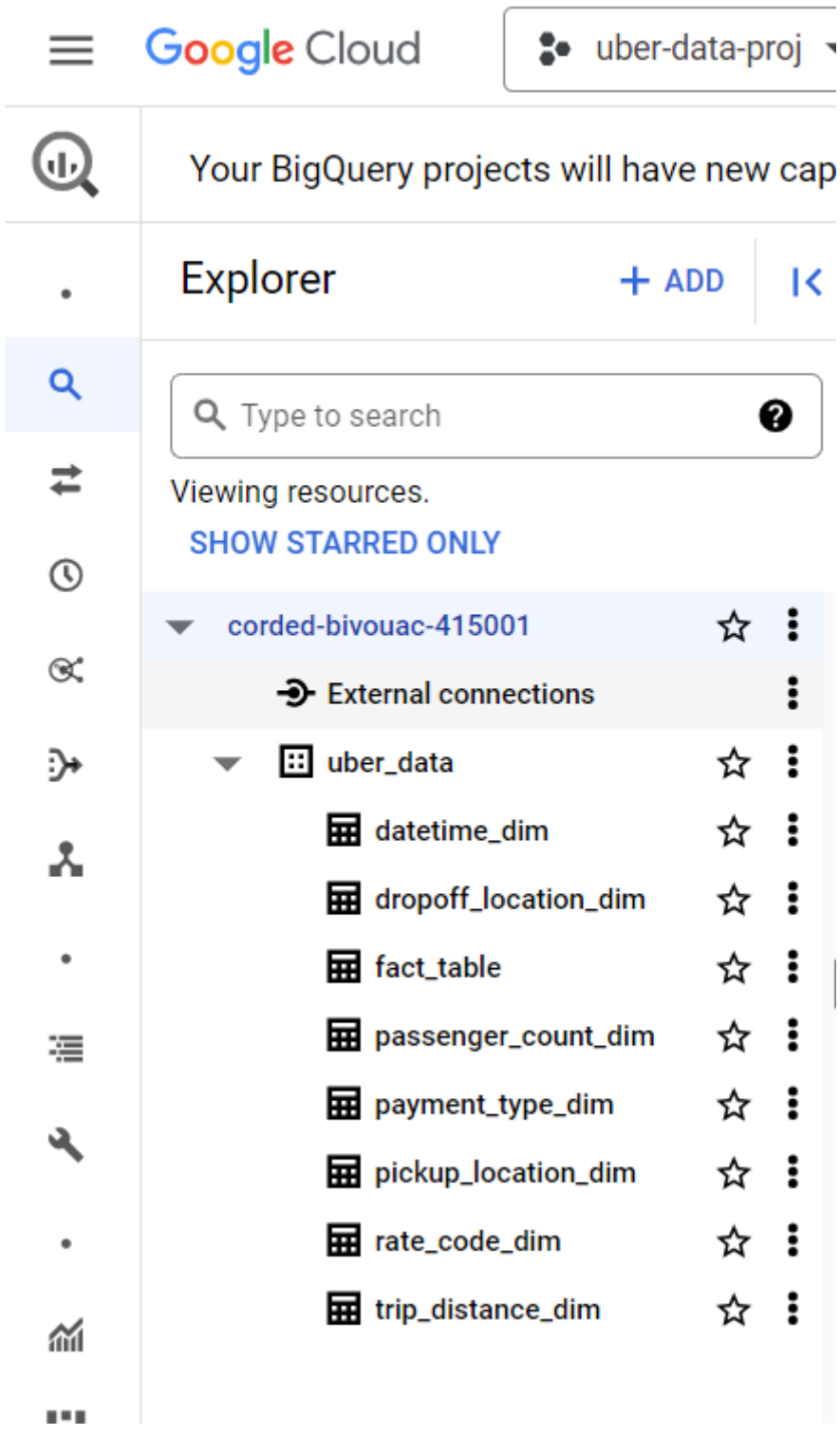


And Woohoo we have successfully exported the data to our BigQuery page.





Open the BigQuery Services on the Google Console and we can see the tables are exported to the database in BigQuery



we can run queries and get insights on the Data in Big Query. We can also create relationships between tables and create new tables in our database on BigQuery .

Below are some of the queries which I ran to get insights on the Uber data Analysis project.

Finally we have to make a Power BI dashboard to Visualize the Data we analysed on BigQuery .

Here is the PowerBi Dashboard I created .