05b_retail_forecast_gcloud_execution.md

Retail Forecast using sessions in Serverless Spark through Vertex AI

Following are the lab modules:

1. Understanding Data

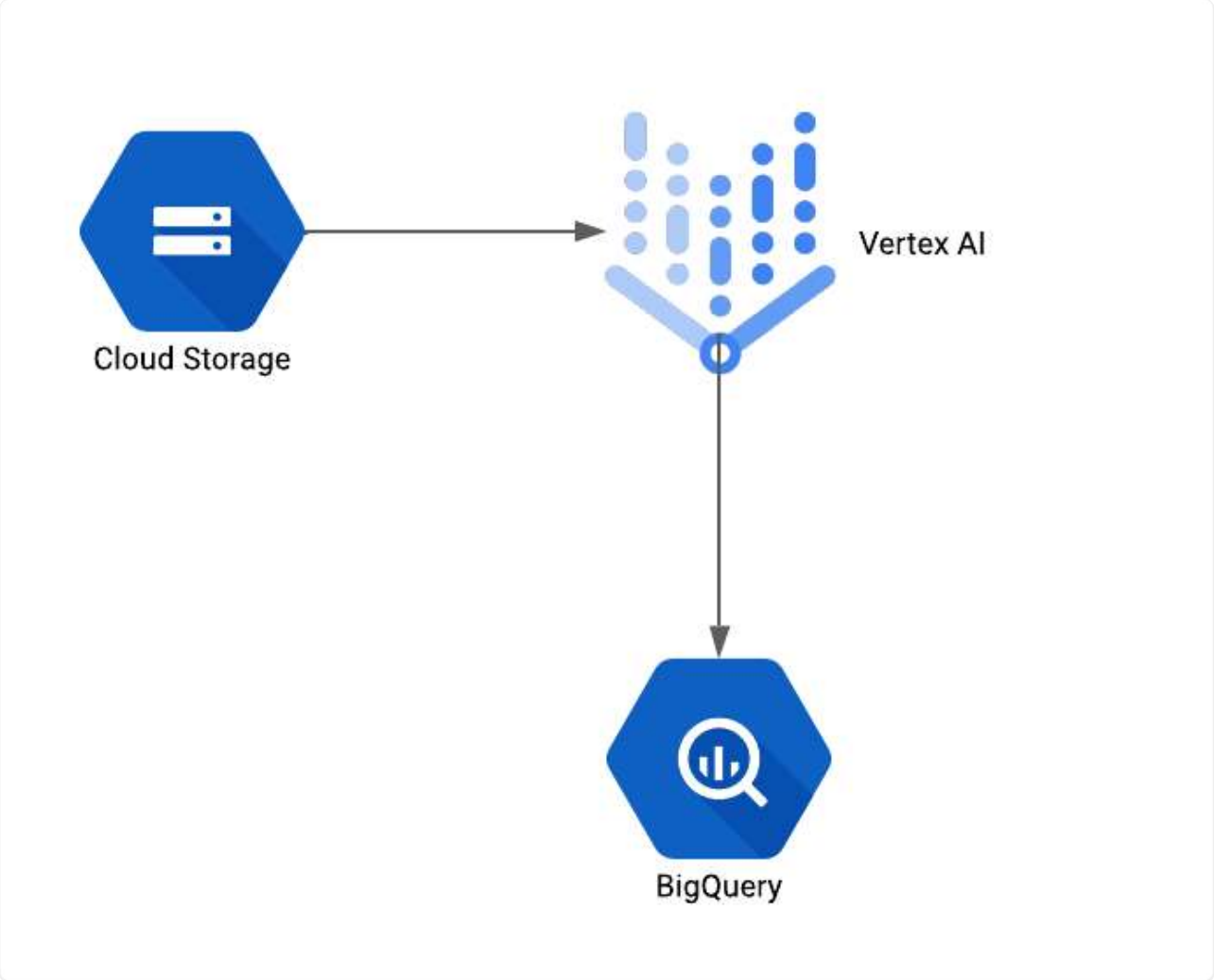
The datasets used for this project are

1. Aisles data.
2. Departments data .
3. Orders data.
4. Products data.
5. Order_products__prior.
6. Order_products__train.

- Aisles: This table includes all aisles. It has a single primary key (aisle_id)
- Departments: This table includes all departments. It has a single primary key (department_id)
- Products: This table includes all products. It has a single primary key (product_id)
- Orders: This table includes all orders, namely prior, train, and test. It has single primary key (order_id).
- Order_products_train: This table includes training orders. It has a composite primary key (order_id and product_id) and indicates whether a product in an order is a reorder or not (through the reordered variable).

- Order_products_prior : This table includes prior orders. It has a composite primary key (order_id and product_id) and indicates whether a product in an order is a reorder or not (through the reordered variable).

2. Solution Architecture



3. Declaring cloud shell variables

3.1 Set the PROJECT_ID in Cloud Shell

Open Cloud shell or navigate to shell.cloud.google.com
Run the below

```
gcloud config set project $PROJECT_ID
```

3.2 Verify the PROJECT_ID in Cloud Shell

Next, run the following command in cloud shell to ensure that the current project is set correctly:

```
gcloud config get-value project
```

3.3 Declare the variables

Based on the prereqs and checklist, declare the following variables in cloud shell by replacing with your values:

```
PROJECT_ID=$(gcloud config get-value project)       #current GCP project where we ar
REGION=                                             #GCP region where all our resour
SUBNET=                                             #subnet which has private google
BUCKET_CODE=                                        #GCP bucket where our code, data
BUCKET_PHS=                                         #bucket where our application lc
HISTORY_SERVER_NAME=                                #name of the history server whic
BQ_DATASET_NAME=                                    #BigQuery dataset where all the
SESSION_NAME=                                       # Serverless Session name.
UMSA_NAME=                                          #user managed service account re
SERVICE_ACCOUNT=$UMSA_NAME@$PROJECT_ID.iam.gserviceaccount.com
NAME=                                               #Your unique identifier
```

Note: For all the variables except 'NAME', please ensure to use the values provided by the admin team.

3.4 Update Cloud Shell SDK version

Run the below on cloud shell-

```
gcloud components update
```

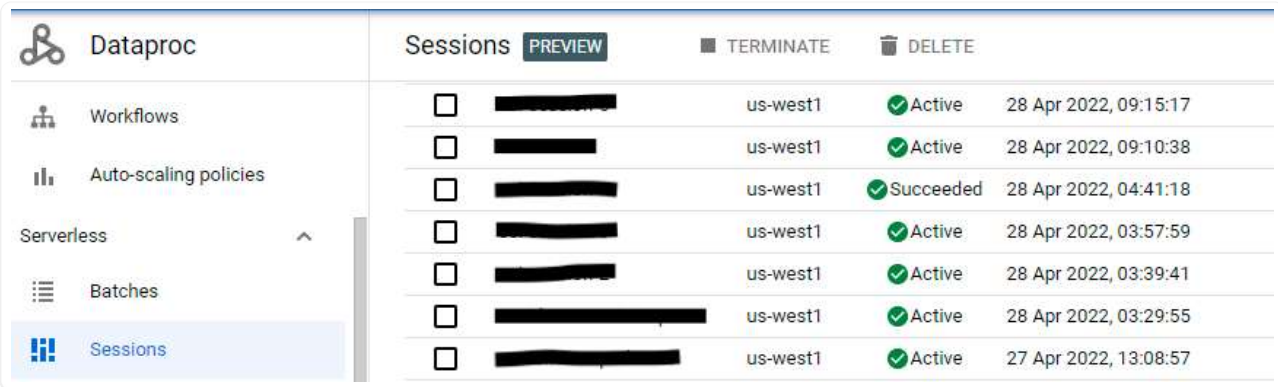
4. Execution

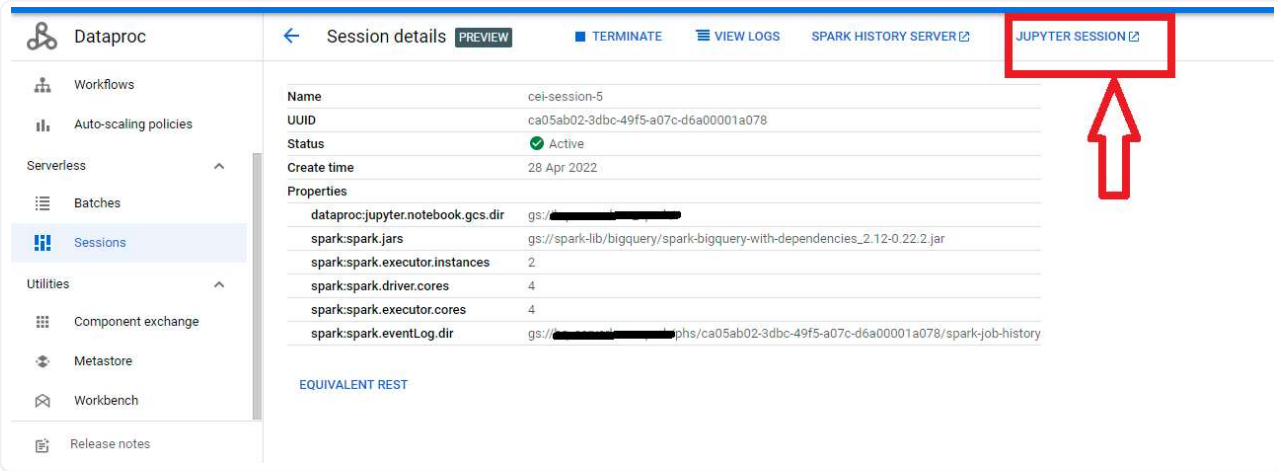
4.1. Run the Batch by creating sessions.

Run the below on cloud shell to create session. -

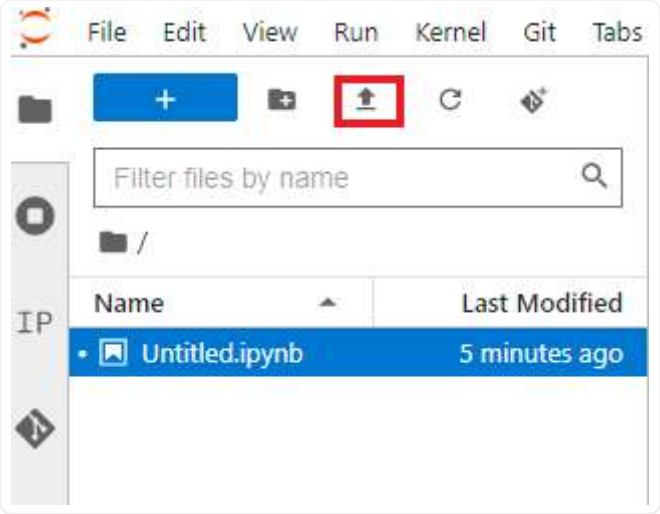
```
  gcloud beta dataproc sessions create spark $SESSION_NAME  \
--project=${PROJECT_ID} \
--location=${REGION} \
--property=spark.jars=gs://spark-lib/bigquery/spark-bigquery-with-dependencies_2.12-
--history-server-cluster=projects/$PROJECT_ID/regions/$REGION/clusters/$HISTORY_SERV
--subnet=$SUBNET \
--property=dataproc:jupyter.notebook.gcs.dir=$BUCKET_CODE
```

- Once the serverless spark session has been created, open the session and click on the jupyter session.

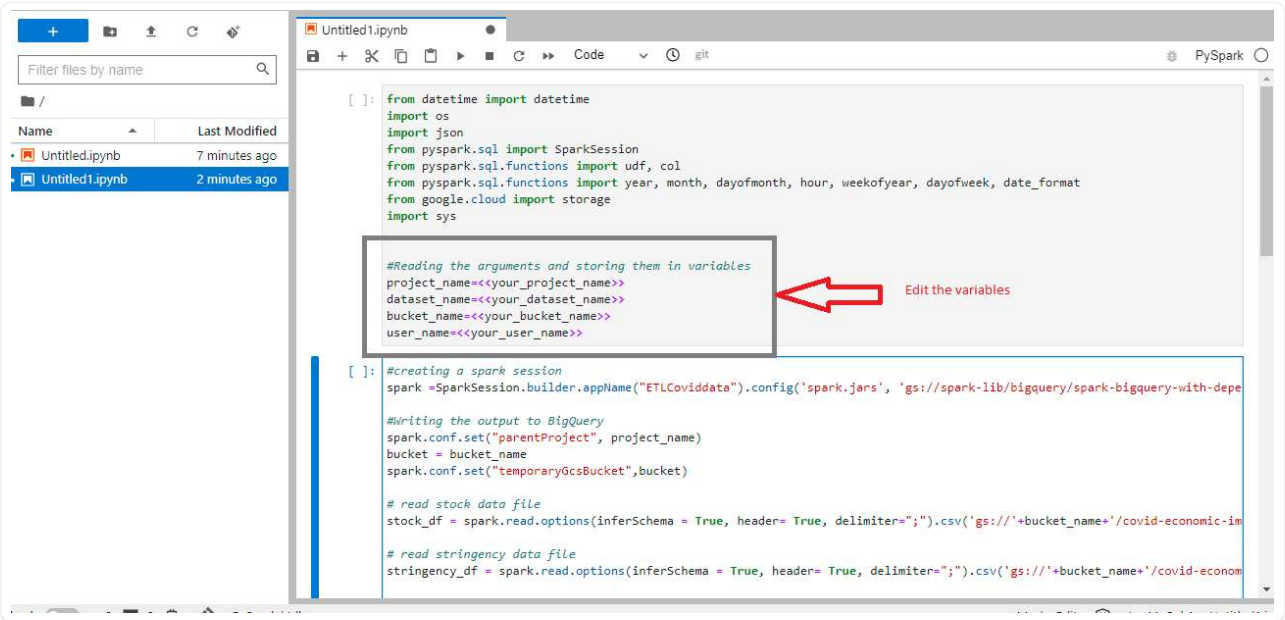




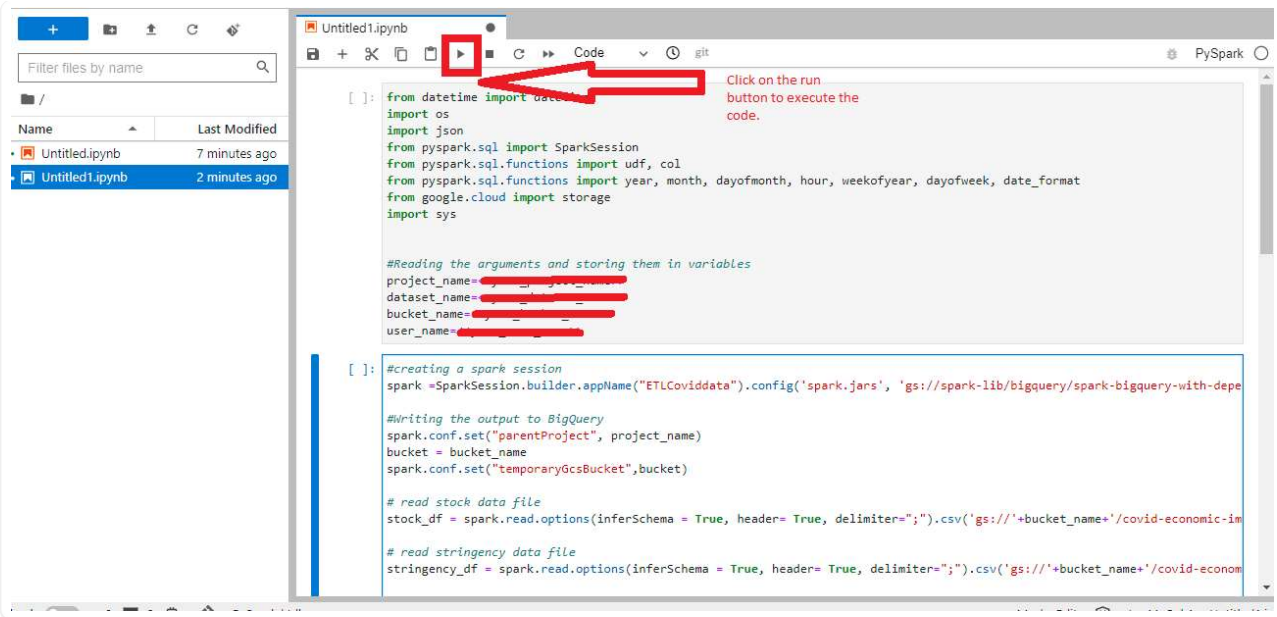
- Select Pyspark Kernel for the execution.



- Upload the notebook 00-scripts/retail-forecast.ipynb and edit the variables: project_name,dataset_name,bucket_name and name with your values.



- Hit the **Execute** button to execute the code.



4.2. Check the output table in BQ

Navigate to BigQuery Console, and check the **retail_forecast** dataset.
Once the data preparation batch is completed, two new tables '<your_name_here>_train_data', '<your_name_here>_test_data', '<your_name_here>_predictions_data' and '<your_name_here>_eval_output' will be created as shown below :

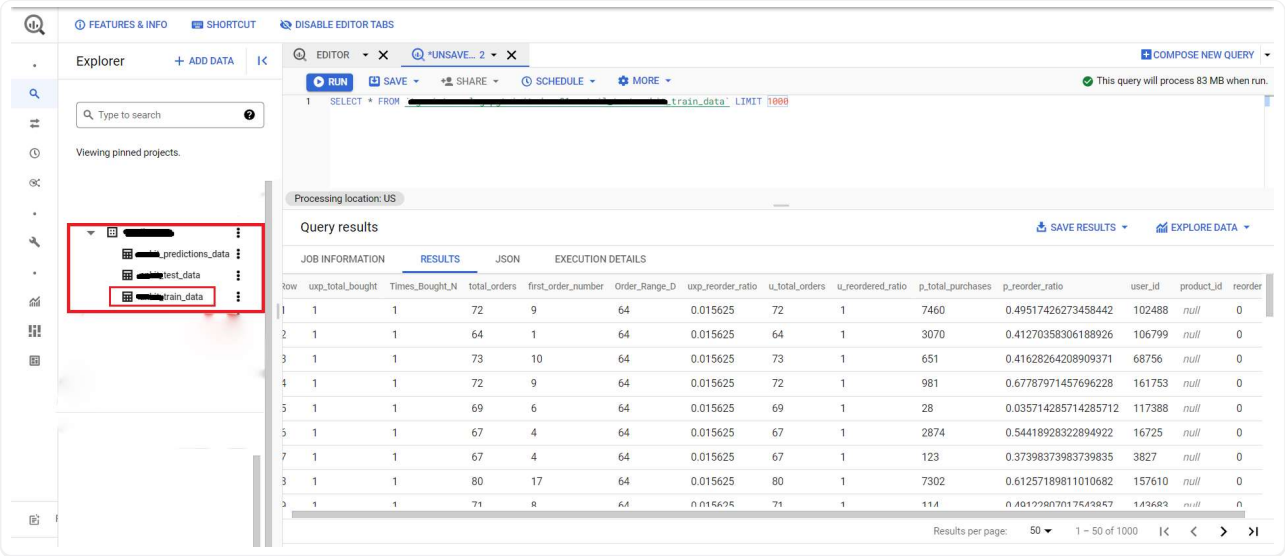
To view the data in these tables -

- Select the table from BigQuery Explorer by navigating 'project_id' > 'dataset' > 'table_name'
- Click on the **Preview** button to see the data in the table

Note: If the **Preview** button is not visible, run the below queries to view the data. However, these queries will be charged for the full table scan.

```
SELECT * FROM `<project_name>.<dataset_name>.<your_name_here>_train_data` LIMIT 10
SELECT * FROM `<project_name>.<dataset_name>.<your_name_here>_test_data` LIMIT 100
SELECT * FROM `<project_name>.<dataset_name>.<your_name_here>_predictions_data` LI
SELECT * FROM `<project_name>.<dataset_name>.<your_name_here>_eval_output` LIMIT 1
```

Note: Edit all occurrences of <project_name> and <dataset_name> to match the values of the variables PROJECT_ID, and BQ_DATASET_NAME respectively

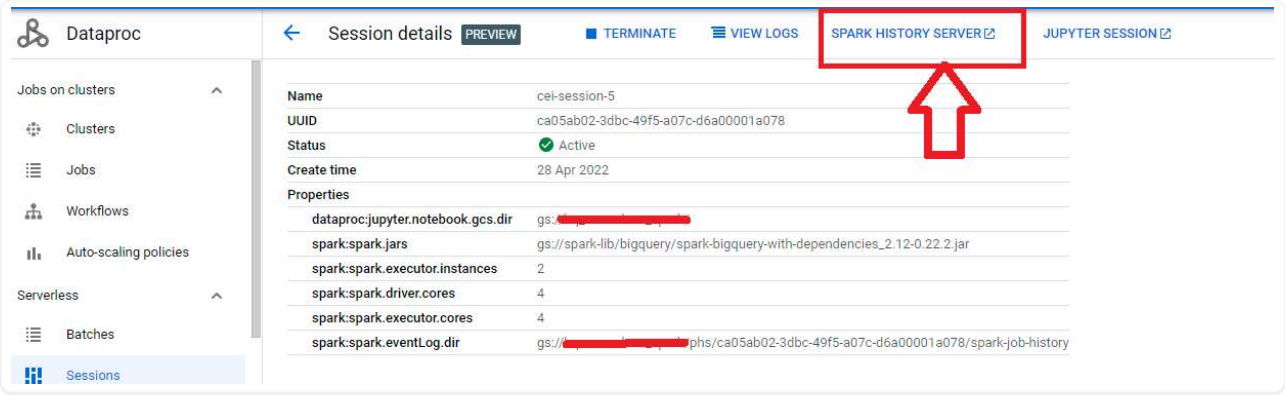


5. Logging

5.1 Persistent History Server logs

To view the Persistent History server logs, click the 'View History Server' button on the Sessions monitoring page and the logs will be shown as below:

As the session is still in active state , we will be able to find the logs in show incomplete applications.



Spark 3.1.2 **History Server**

Event log directory: gs:/[redacted]/phs/*/spark-job-history

Last updated: 2022-04-04 16:52:29

Client local time zone: Asia/Calcutta

Search:

Version	App ID	App Name	Driver Host	Started	Completed	Duration	Spark User	Last Updated	Event Log
3.2.1	[redacted]	[redacted]	10.122.15.217	2022-04-04 16:35:43	2022-04-04 16:36:44	1.0 min	spark	2022-04-04 16:36:45	Download

Showing 1 to 1 of 1 entries
Show incomplete applications

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