Pluto7

How to Set Up Demand ML Solution on Google Cloud with Cortex





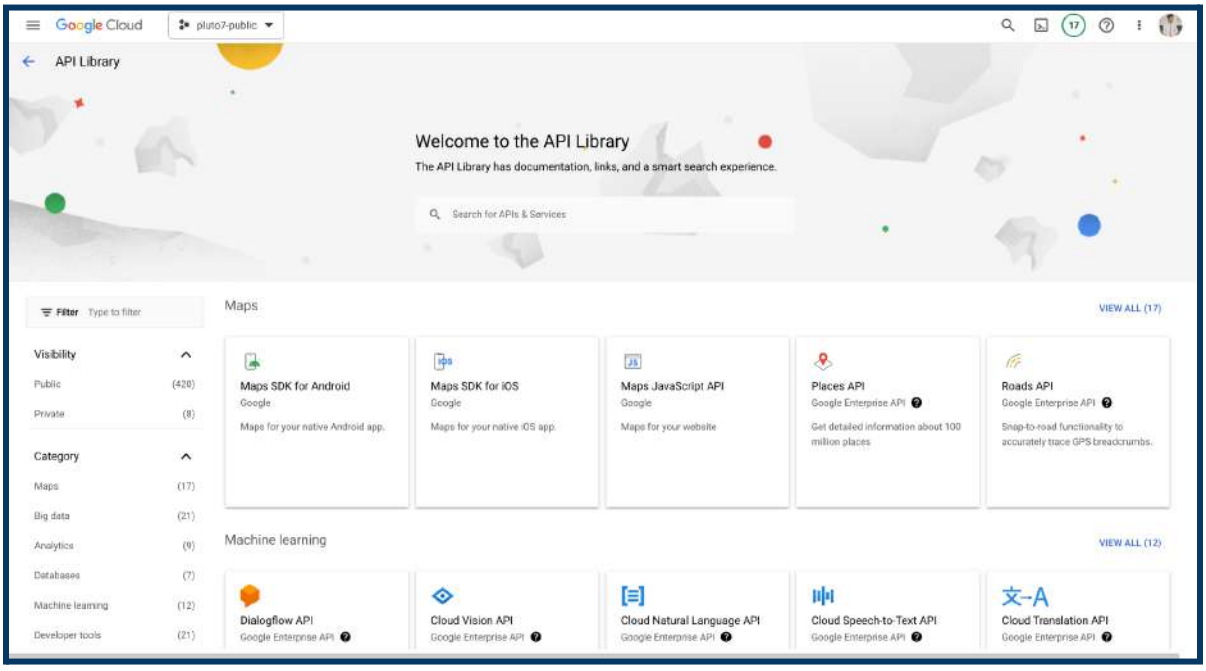


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Pre-installation requirements:

Visit the **APIs & Services** section in the Google Cloud Console and enable all the following APIs:

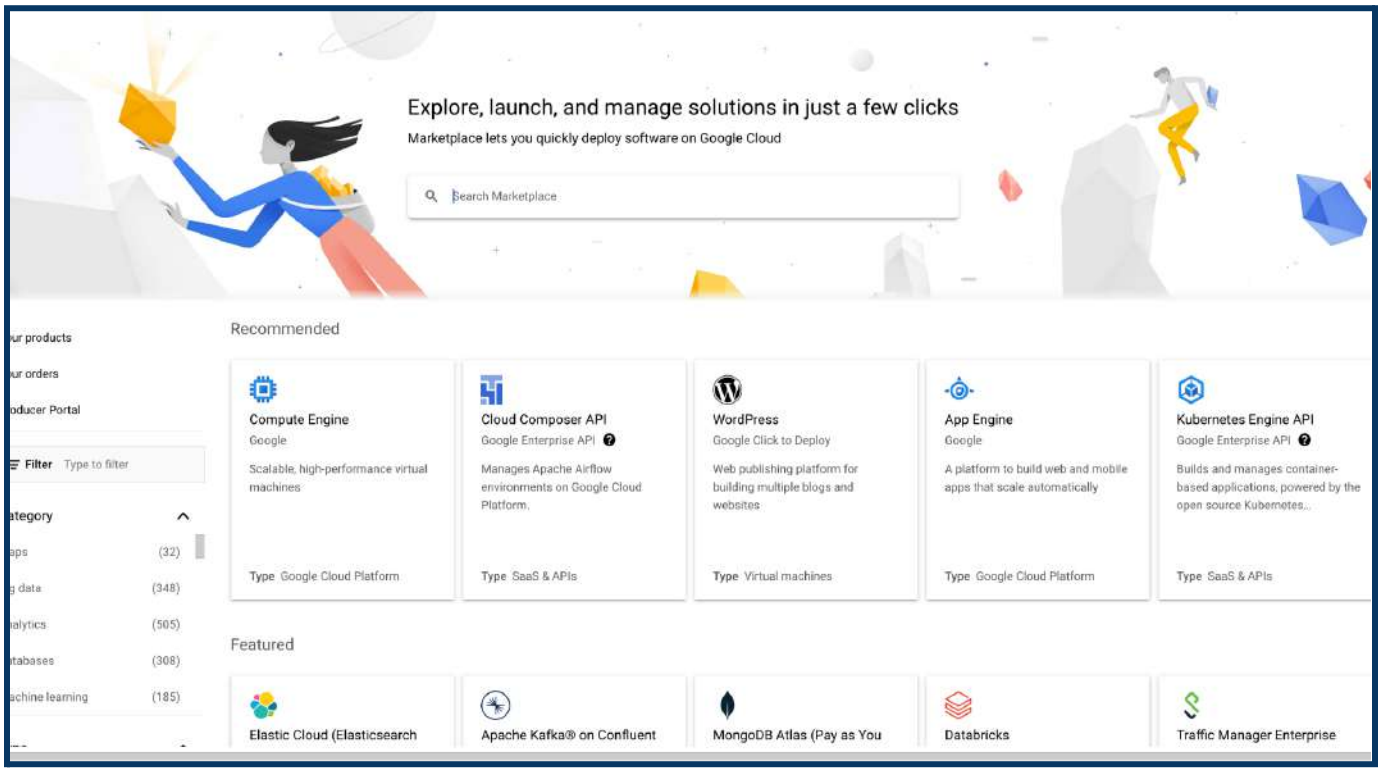
- Compute Engine
- Cloud Storage
- Container Registry
- Vertex AI
- Google Cloud Storage JSON
- Firestore
- BigQuery
- IAM Service Account Credentials



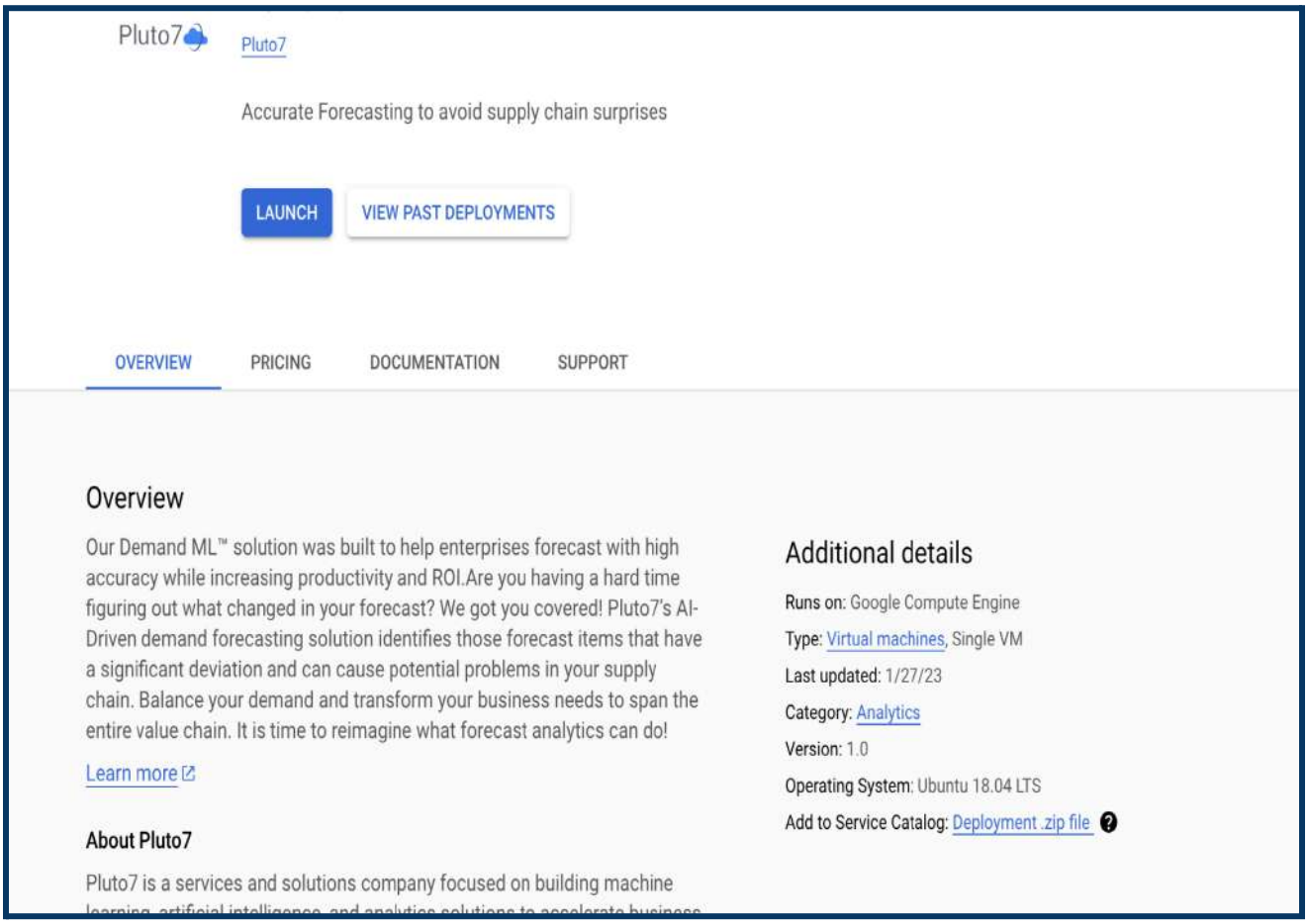
Installation Steps:

1. After enabling all the **APIs** mentioned above, go to [GCP Market Place] and search for **Demand ML**.

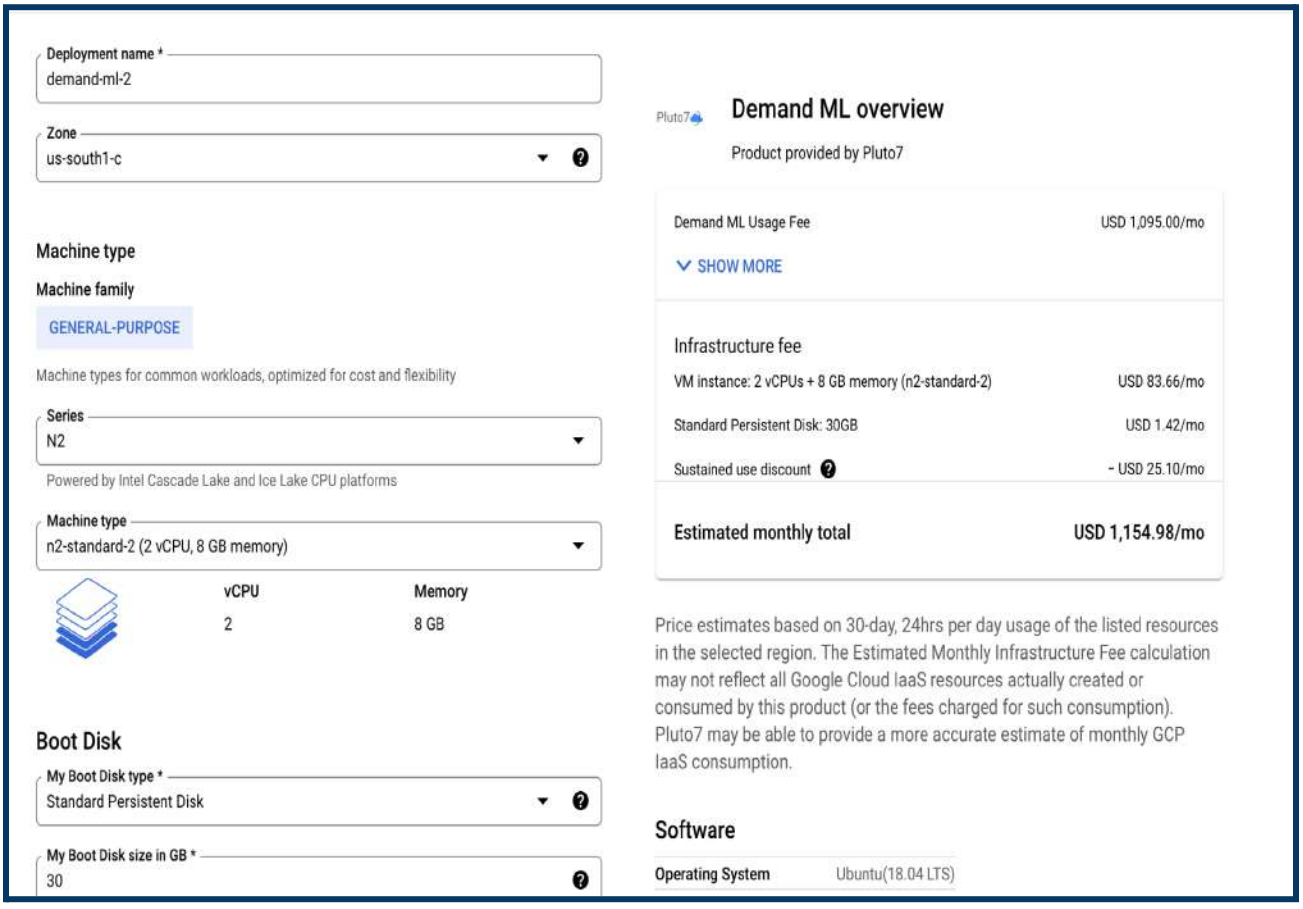
Once you have selected Demand ML, you will be redirected to the **Demand ML Solution home screen**. (the home screen looks like the image shown below).



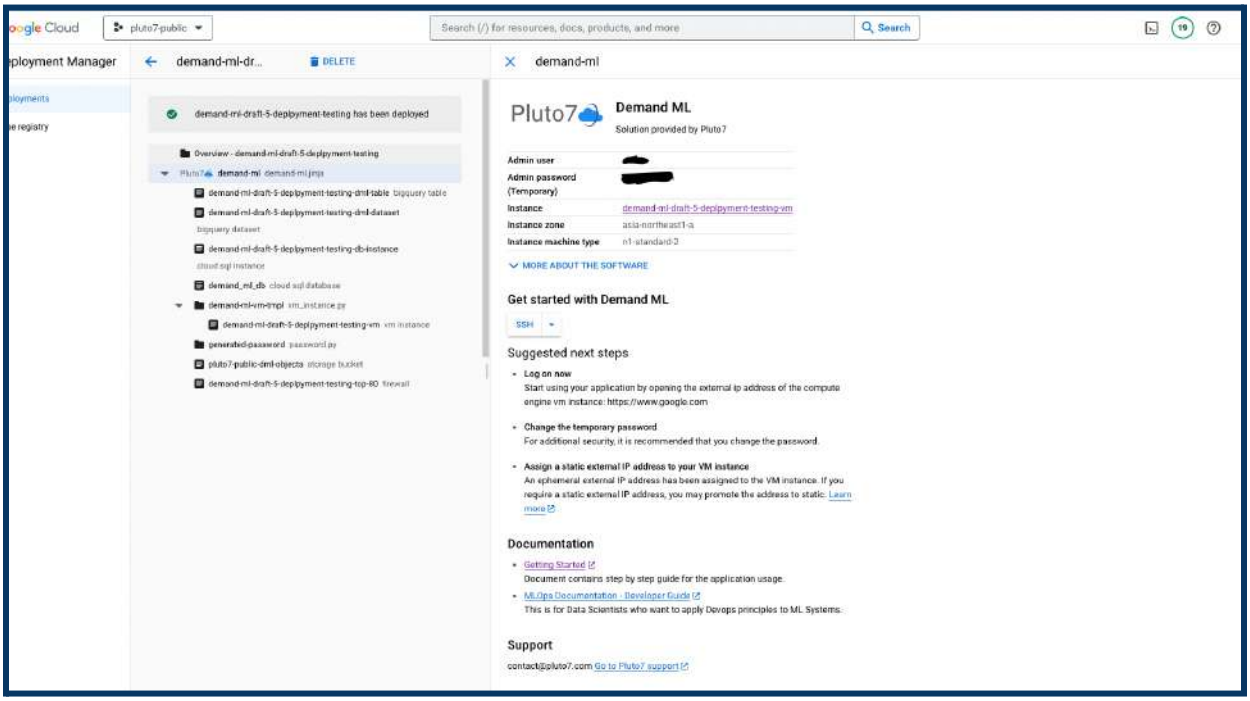
2. Next, click on the **LAUNCH ON COMPUTE ENGINE** button. It will redirect you to the deployment page.



3. On the **Deployment page,** scroll to the **bottom of the page,** and to deploy the solution, **click on the deploy button**. The page will be redirected to the deployment manager page, and it will show all cloud services used for the solution. Wait until the deployment gets completed.



4. Wait till the deployment gets completed.



5. Now select the deployed instance and SSH into the VM.

```
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1098-gcp x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Tue Feb 21 04:48:47 UTC 2023

  System load:  0.75              Processes:              119
  Usage of /:   48.2% of 28.89GB  Users logged in:        0
  Memory usage: 12%               IP address for ens4:    10.128.15.216
  Swap usage:   0%                IP address for docker0: 172.17.0.1

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

14 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


*** System restart required ***
Last login: Mon Feb 20 17:01:41 2023 from 35.235.244.32
alok@instance-docker-fix-marketplace-update:~$
```

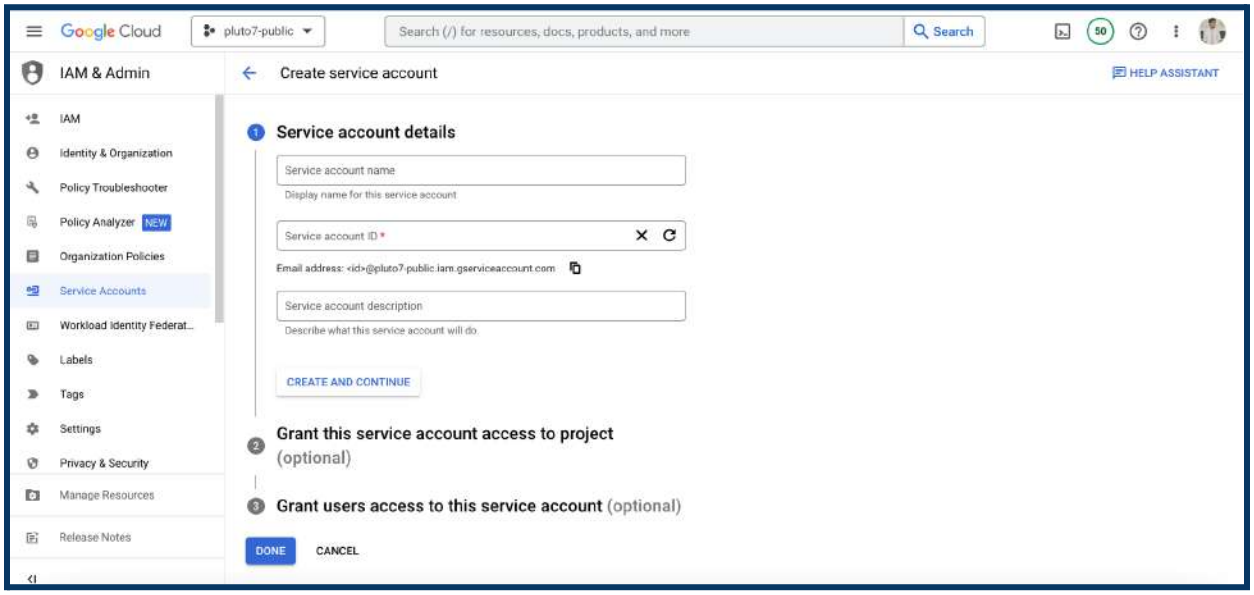
Click on the setting icon on the SSH window and select " **Change Linux Username** ".

Enter " **ubuntu** " as the username and click on the **Change** button.

6. After this, go to IAM in the GCP Console and navigate to service accounts. Create a service account with the following permissions:

AI Platform Service Agent
App Engine Admin
App Engine Code Viewer
BigQuery Admin
BigQuery Data Editor
BigQuery Job User
Cloud Build Editor
Cloud Datastore Owner
Cloud Functions Admin
Cloud SOL Admin
Container Registry Service Agent
IAP Policy Admin
Project IAM Admin
Service Account Admin
Service Account User
Service Usage Admin
Storage Admin
Vertex AI Custom Code Service Agent
and download the JSON key file of the service account.

7. Rename this downloaded JSON key file as" **key.json** ".



8. Go To **IAM** & **Admin** in the GCP cloud console and click on the **checkbox** on the top right which says **"Include Google-provided role grant**." Once enabled, go to the **filter search box** and search for

"@gcp-sa-aiplatform-cc.iam.gserviceaccount.com"

By default, this service account has only the "Vertex AI Custom Code Service Agent" role assigned.

Edit the roles and add the following roles along with the existing ones to this service account :

- Cloud Datastore User
- BigQuery Data Editor

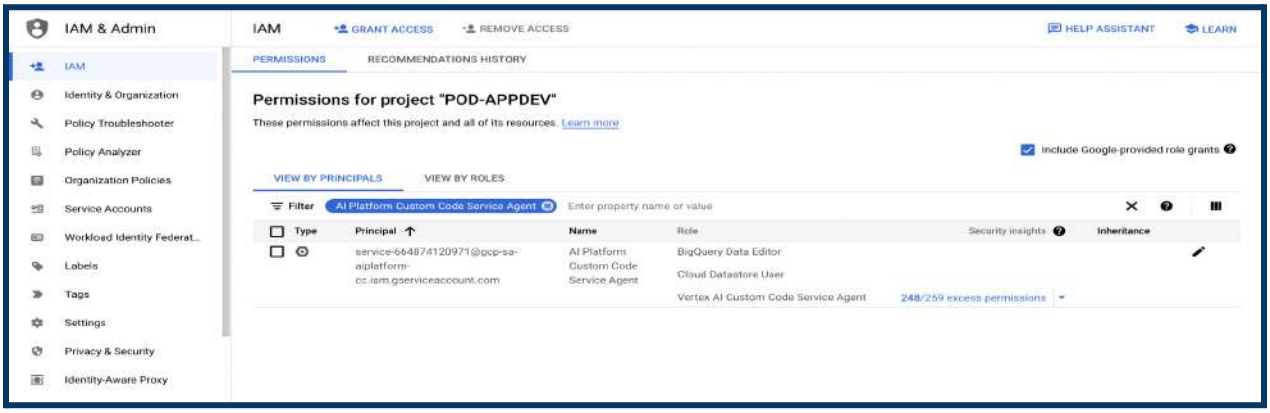
Note: This service account should have these three roles assigned to it

Next , You will find the cloud build default service account, which ends with, cloudbuild@gserviceaccount.com.

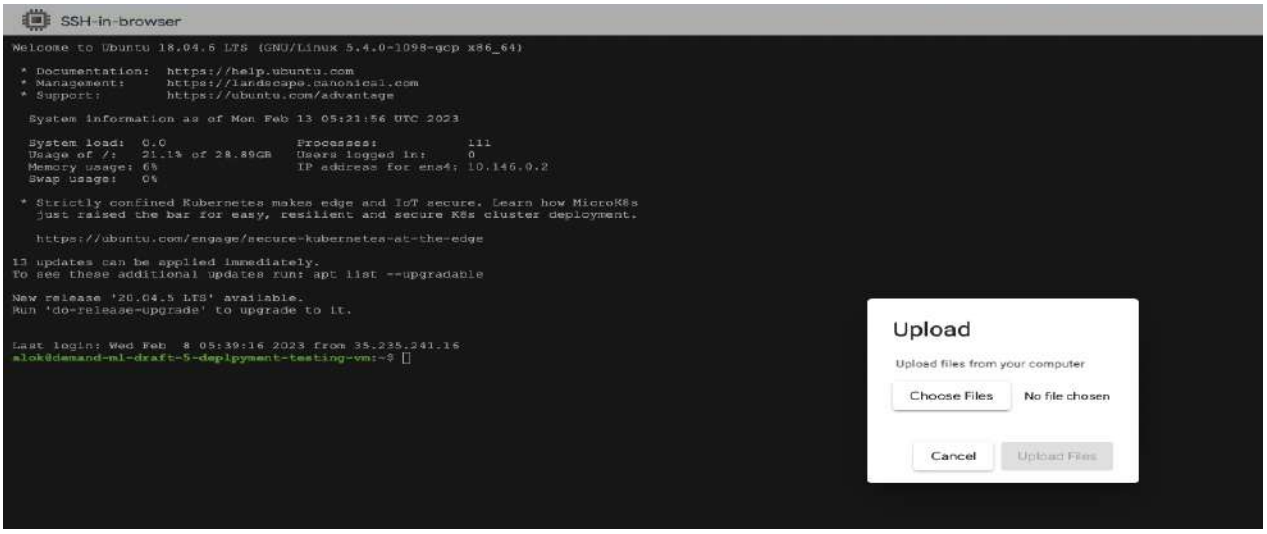
Select this service account and add the following roles to it:

- App Engine Admin
- BigQuery Data Editor
- BigQuery Job User
- Cloud Build Service Account
- Service Account User
- Storage Admin

Note: This service account should have these three roles assigned to it



9. Upload the service account JSON key file (key.json) to the compute engine VM instance



10. Now run the "**ls**" command. You will find three " **.sh** " files. Run the following command to make it executable,

- sudo chmod +x master.sh

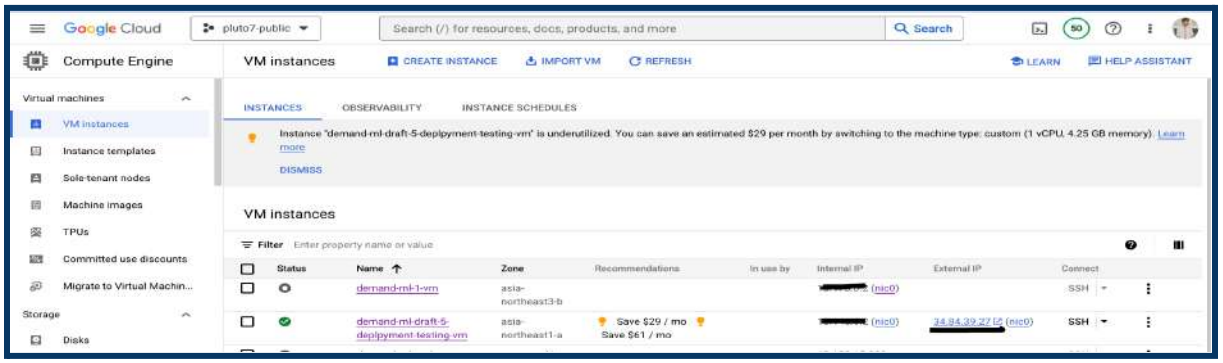
Once it is made executable , you need to run the file. In order to do that, run the following command:

- ./master.sh

NOTE: This command will take **30 minutes** to complete the execution.

WARNING : DO NOT LET THE SYSTEM TO ENTER SLEEP MODE DURING THE EXECUTION.

Once completed, run the following commands one at a time.



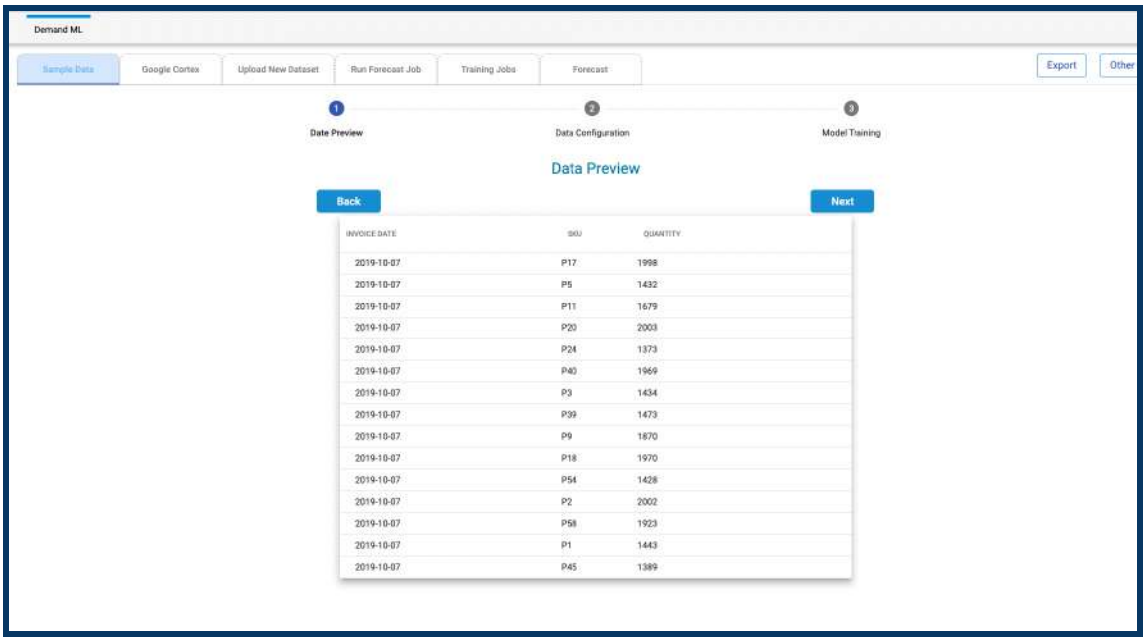
11. Copy the external IP address of the VM Instance in the browser along with the port number as 3000. The format should be http://external_ip_address:port_nuumbe

12. Paste the external IP address of the VM Instance in the browser along with the port number as 3000.

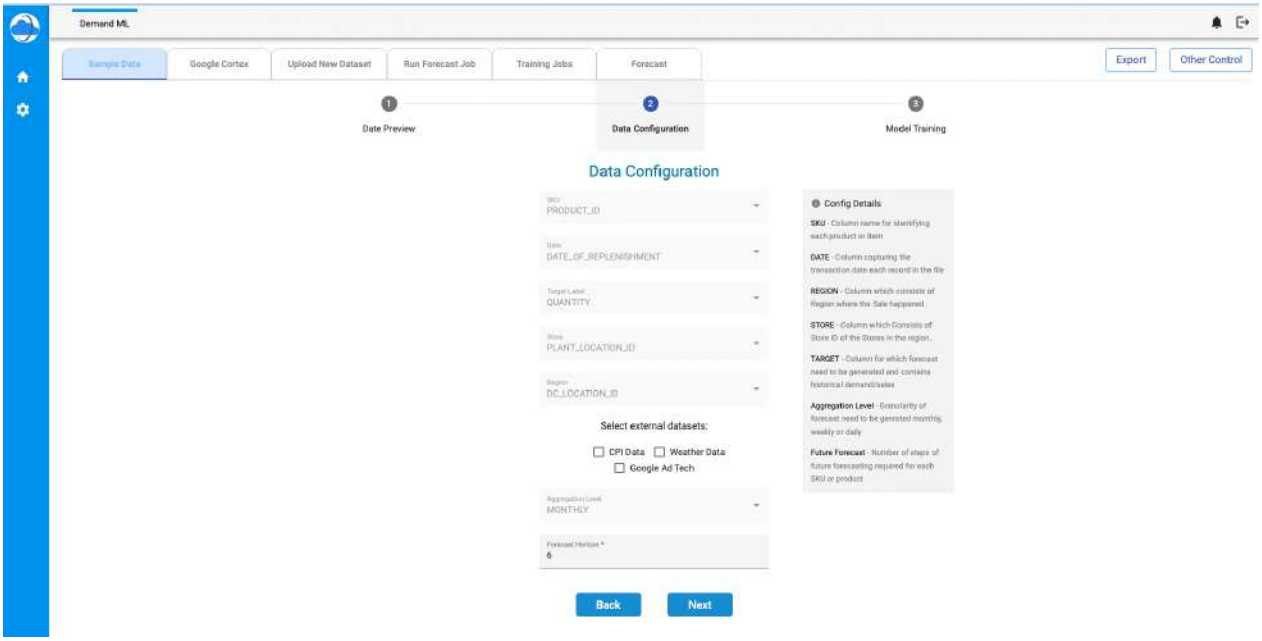
The format should be http://external_ip_address:port_nuumber

Solution Usage Guide :

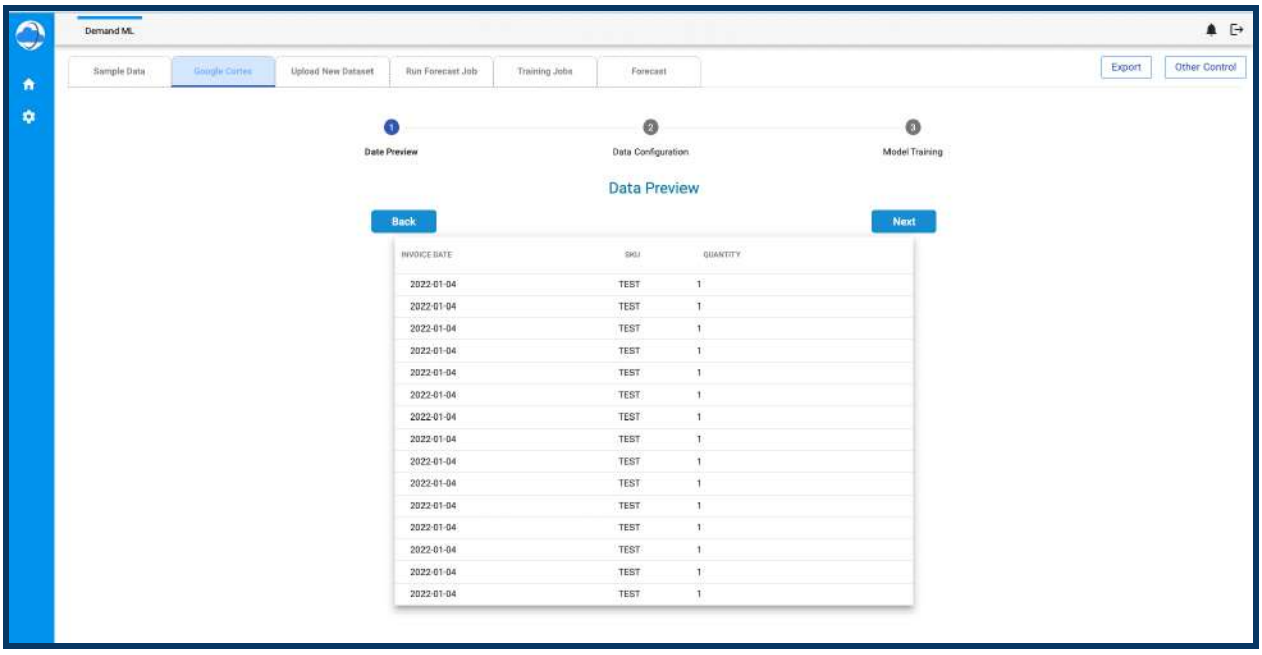
1. After Successful setup, the app redirects to the datasets page,



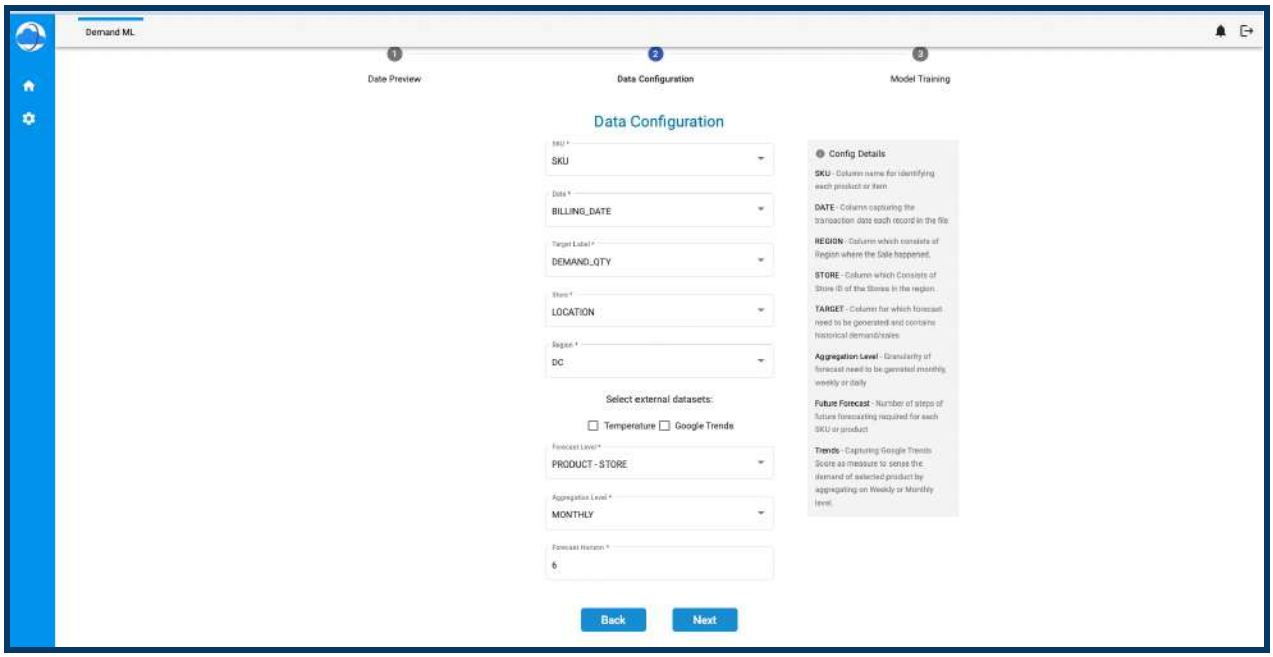
2. Upload New Dataset. The sample dataset is available in Cloud Storage and the bucket name can be identified as **[GOOGLE_CLOUD_PROJECT_NAME]-dml-objects**. The sample dataset is present in the bucket under ***sample_dataset*** folder with the name ***sample-dataset.csv.***



3. This is the Google Cortex Data tab, it gives a preview of the Google Cortex Data.



4. This is the data configuration for the Google Cortex Data. The user can enter the configuration and start the ML model training for the Google Cortex Data.



5. Click on the upload dataset button present on the top right side of the screen

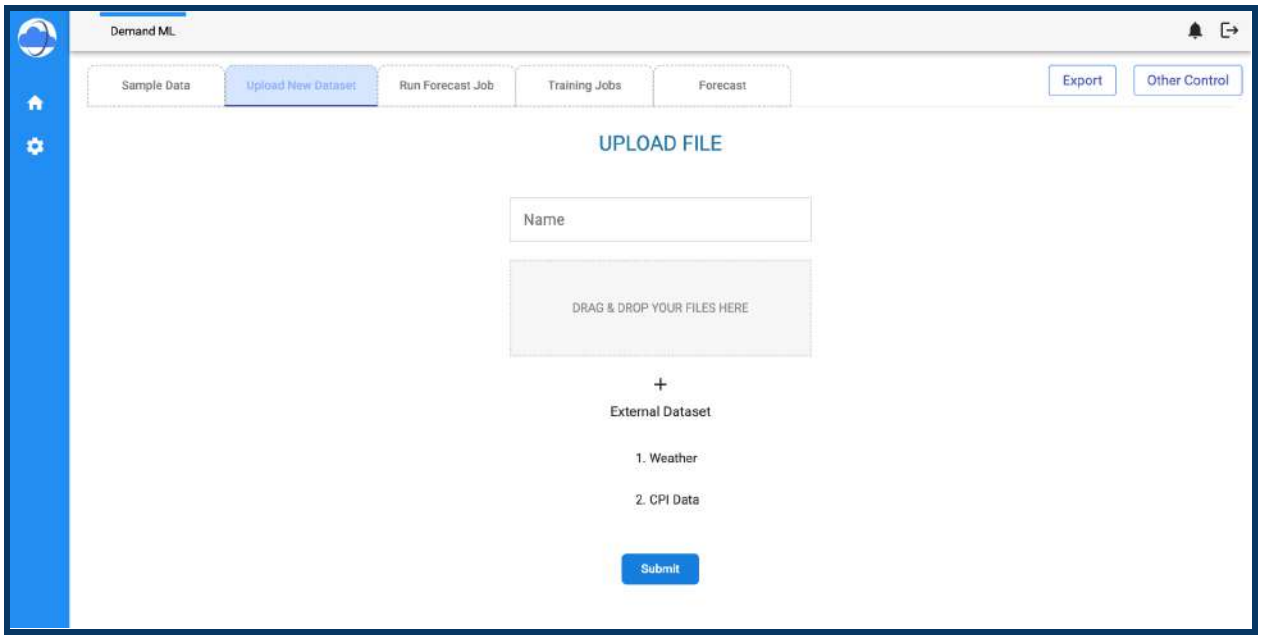


Fig: Upload Dataset

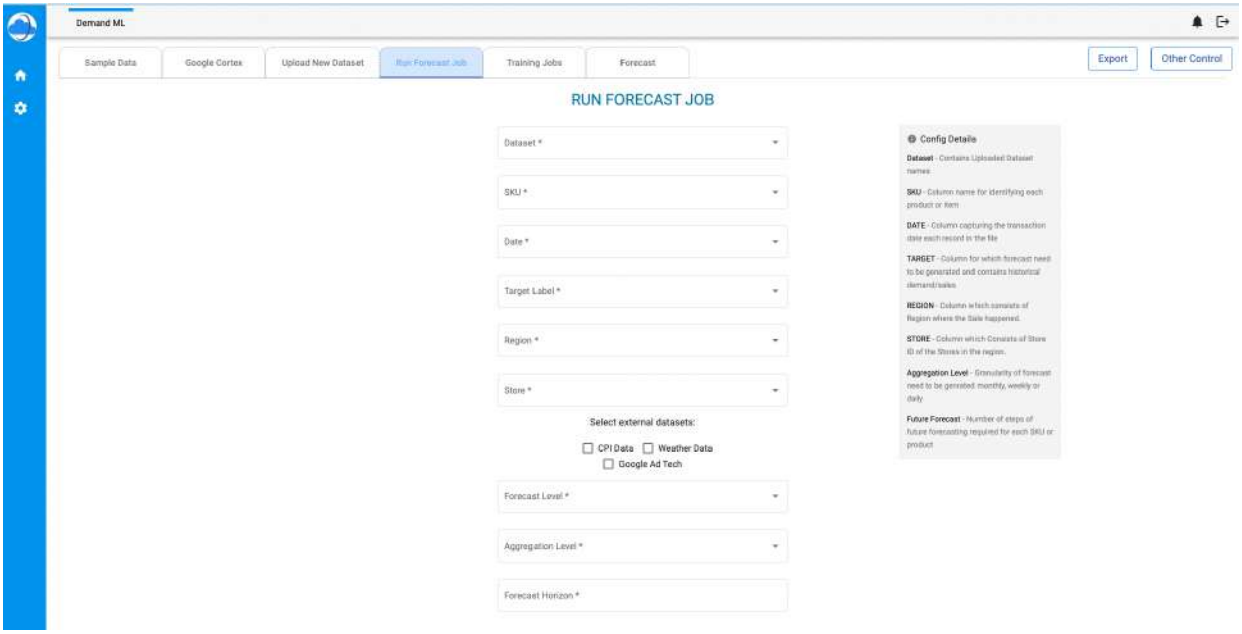


Fig: Select a dataset

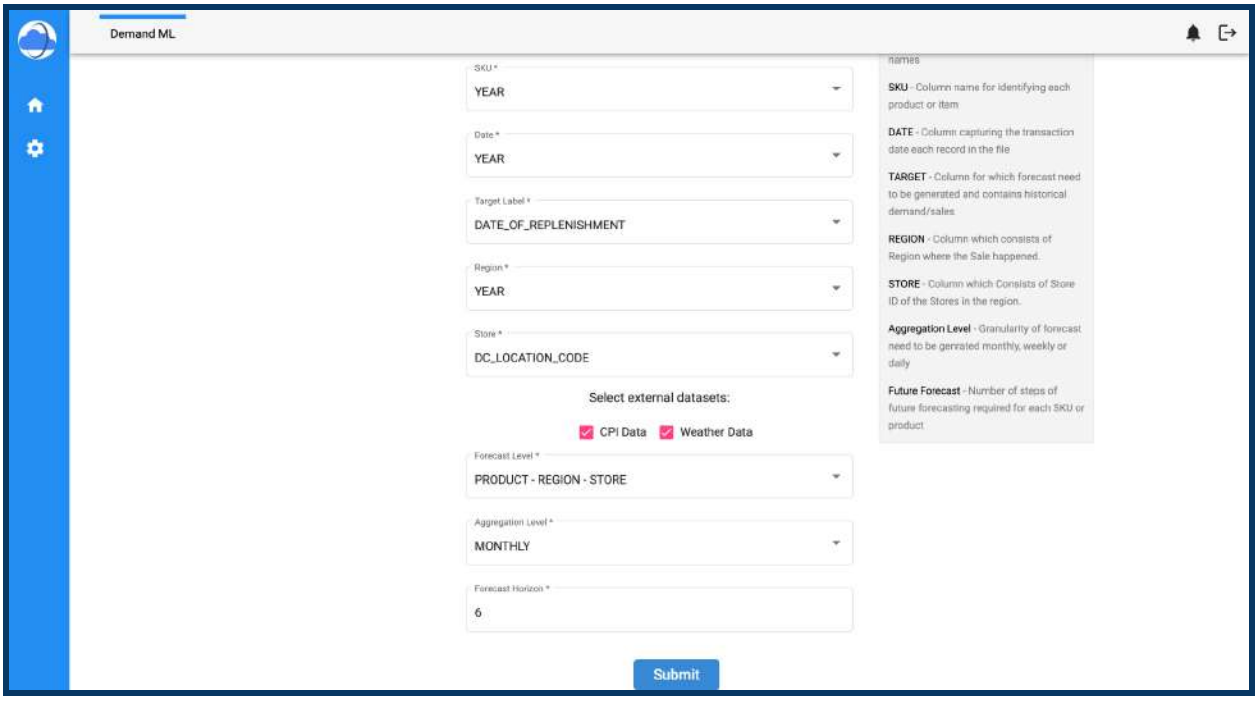


Fig: submit the dataset

6. After data uploading is completed, go to the data experiments page and create a data experiment for the uploaded dataset

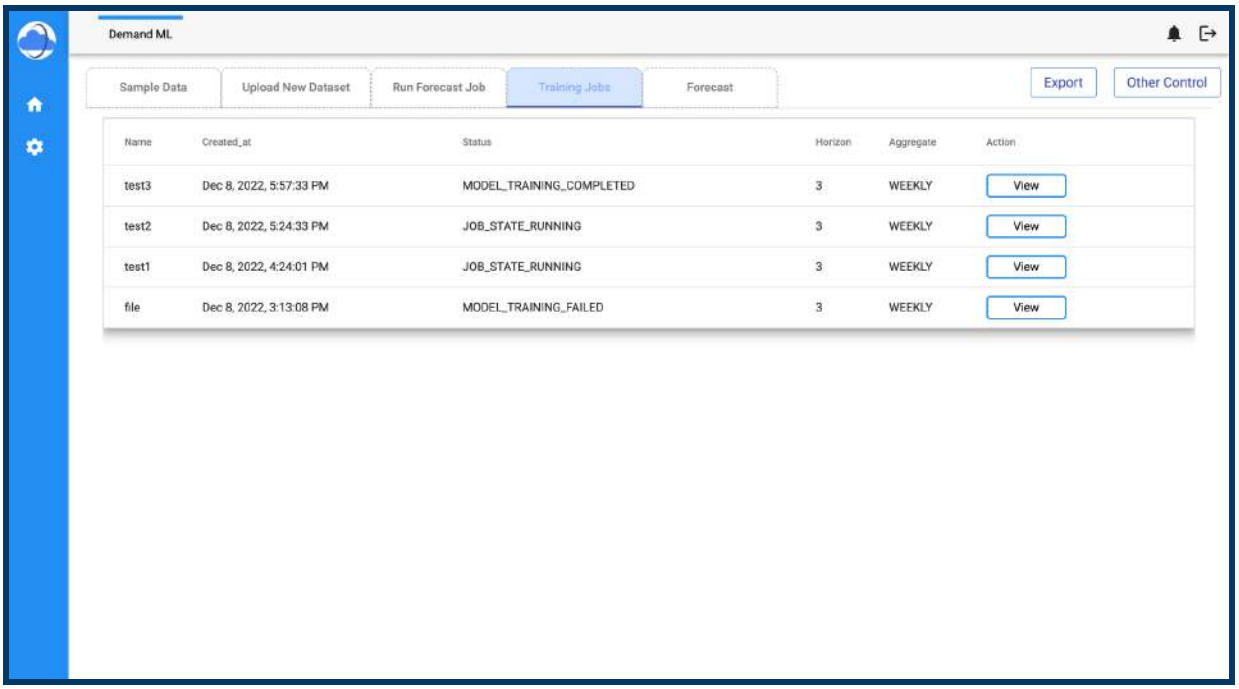


Fig: Training Jobs home page

7. Upon clicking on any of the training jobs, the user can view the forecastability as the output of the ML model for that dataset.

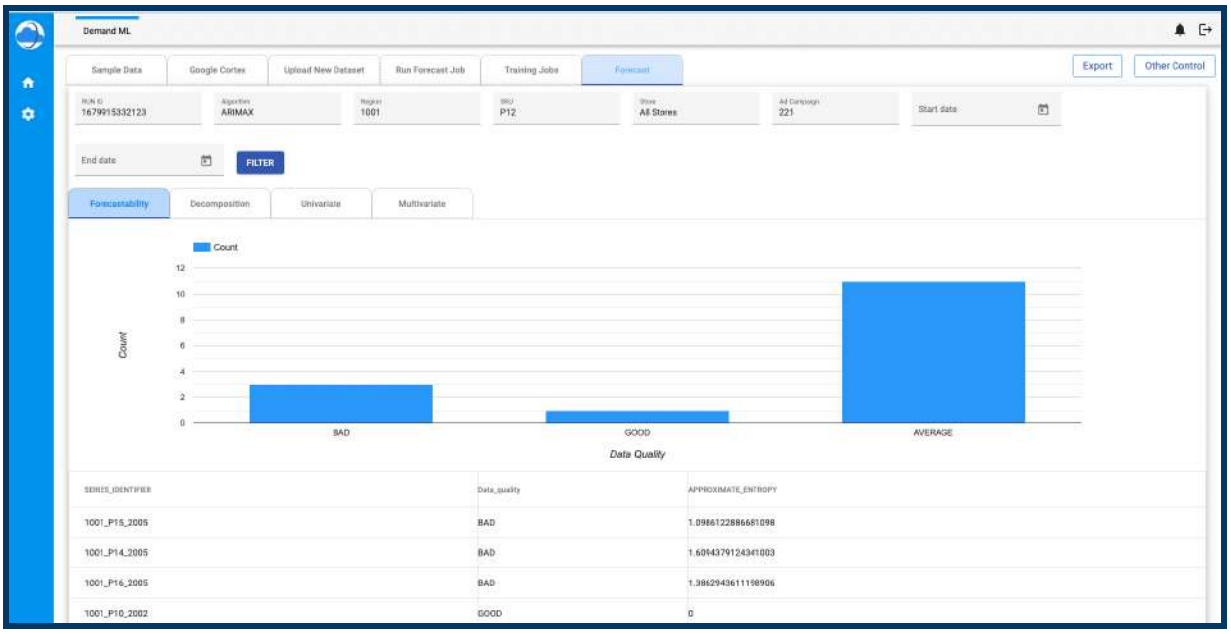


Fig: Forecastability

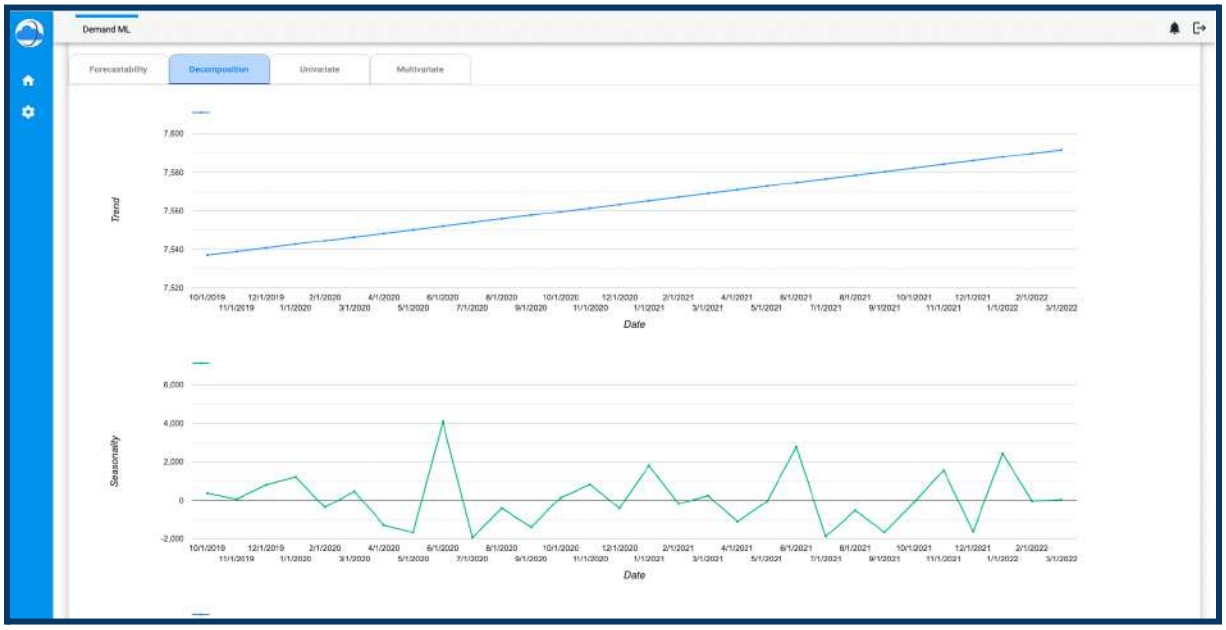
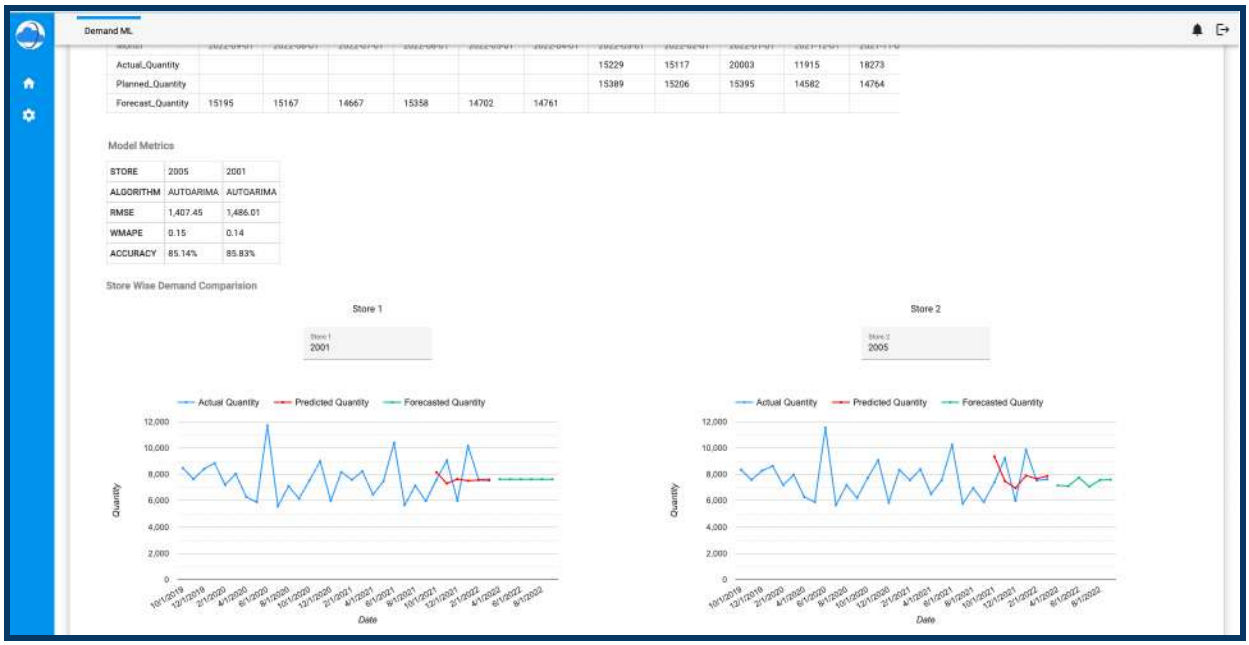


Fig: Seasonality decomposition of the dataset

8. The user can view the ML model results for univariate forecasting which shows the output of the ML model without an external dataset.



9. The user can view ML model results for univariate forecasting, which shows the output of the ML model with external datasets



Fig: Multivariate forecasting output

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For personalized technical assistance, please contact our solutions specialist at alok@pluto7.com

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