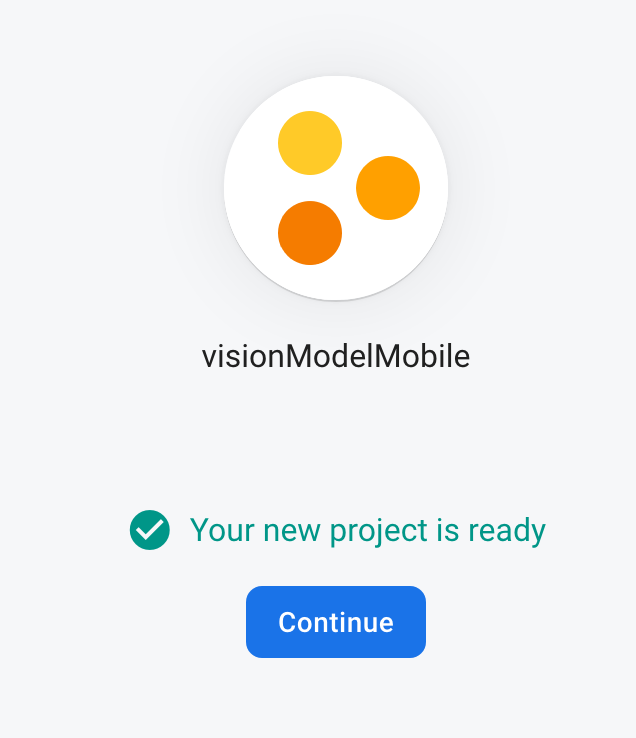
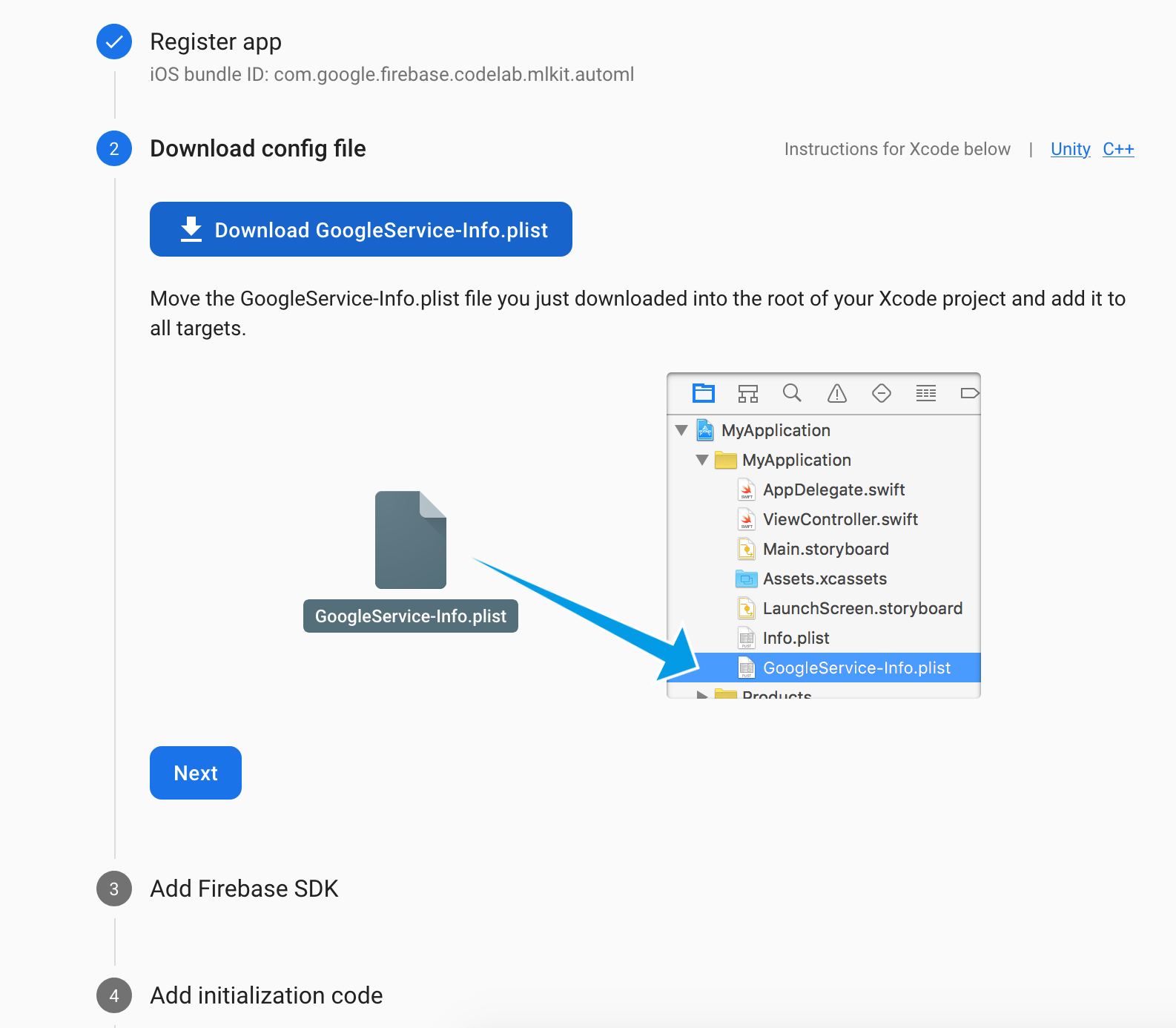
ML Kit Codelab

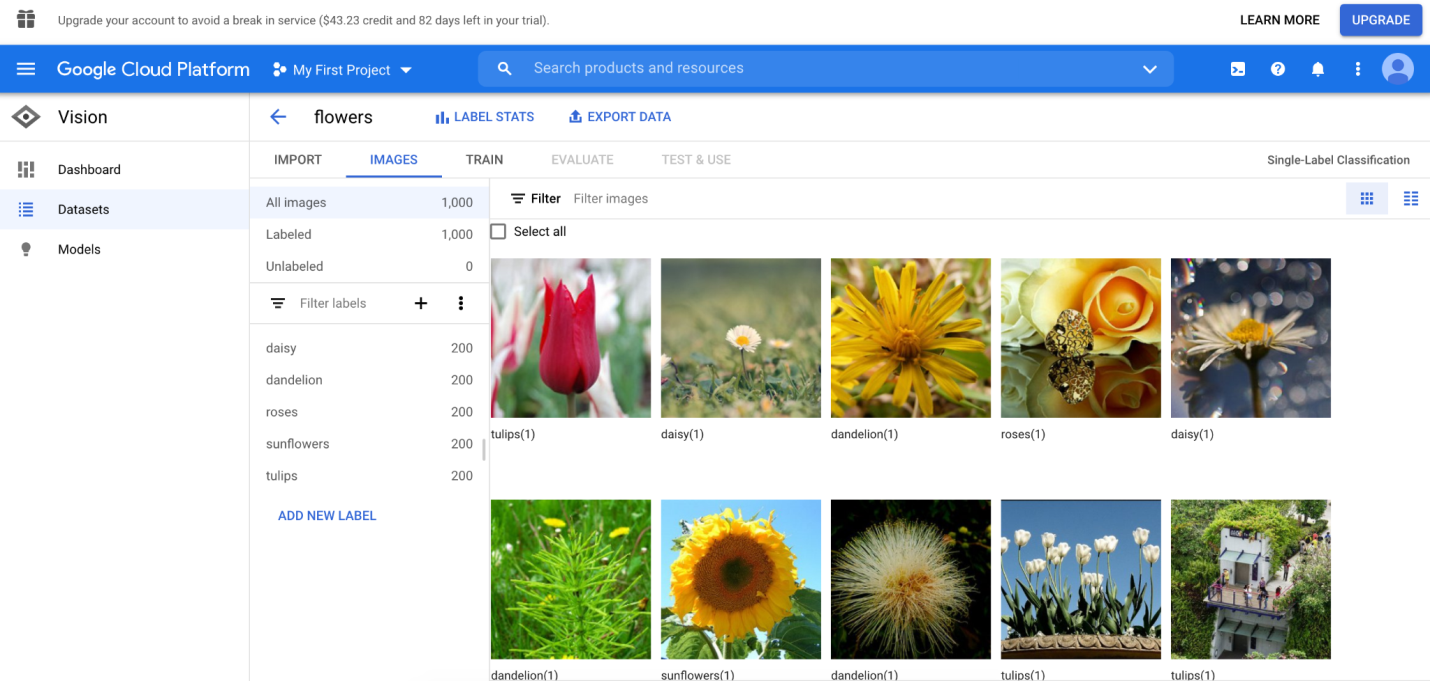


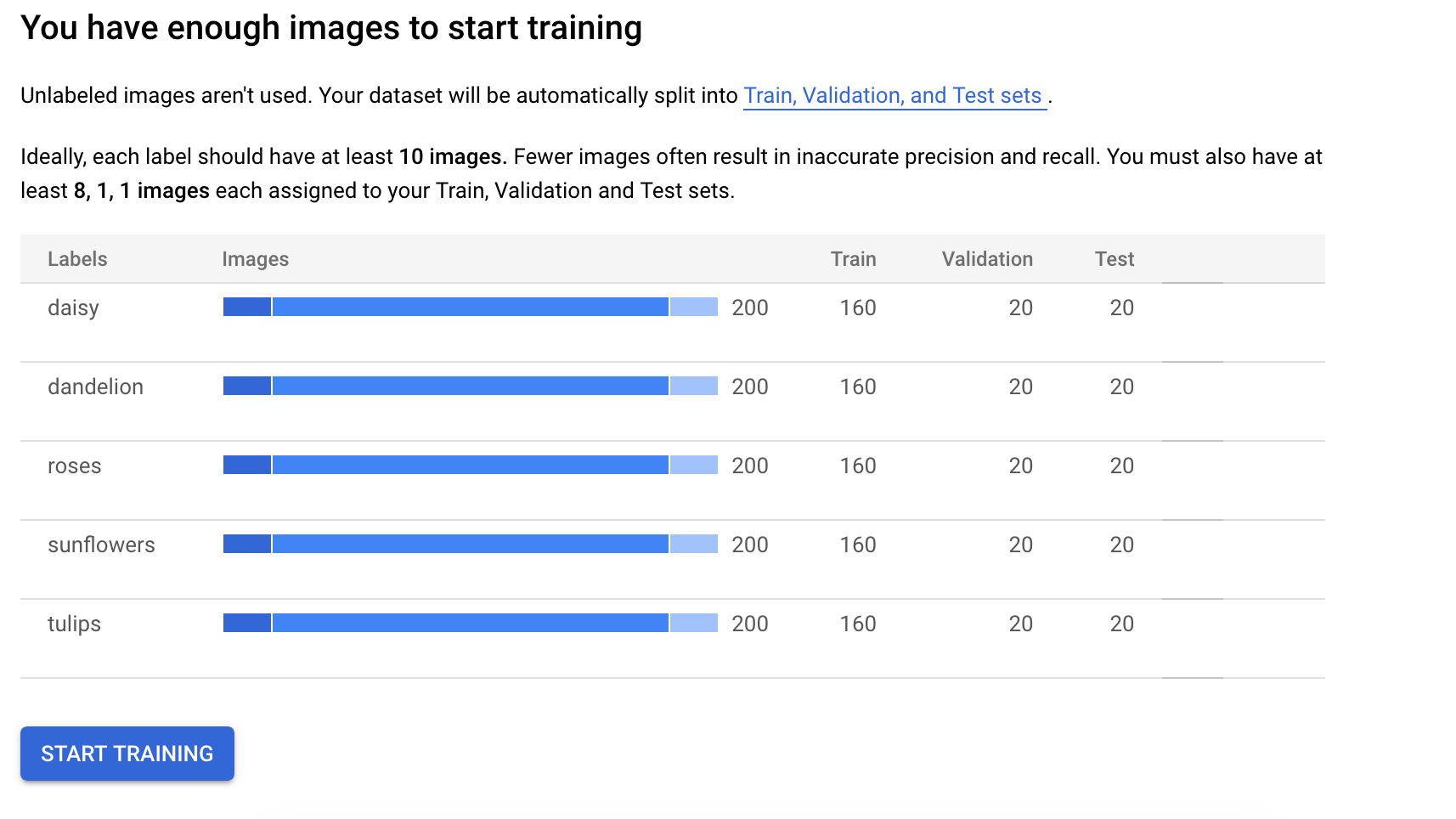


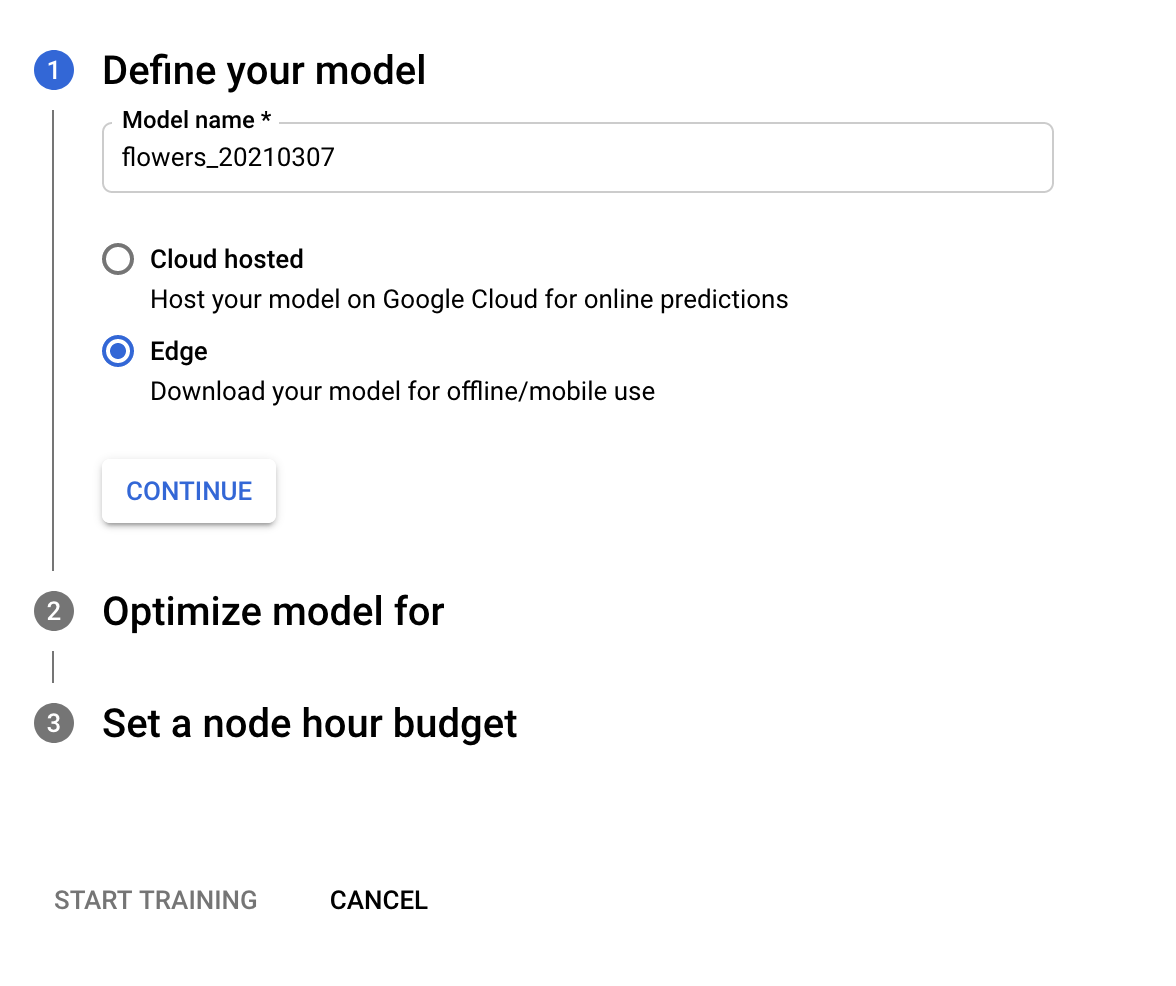
Install cocoapods on mac:

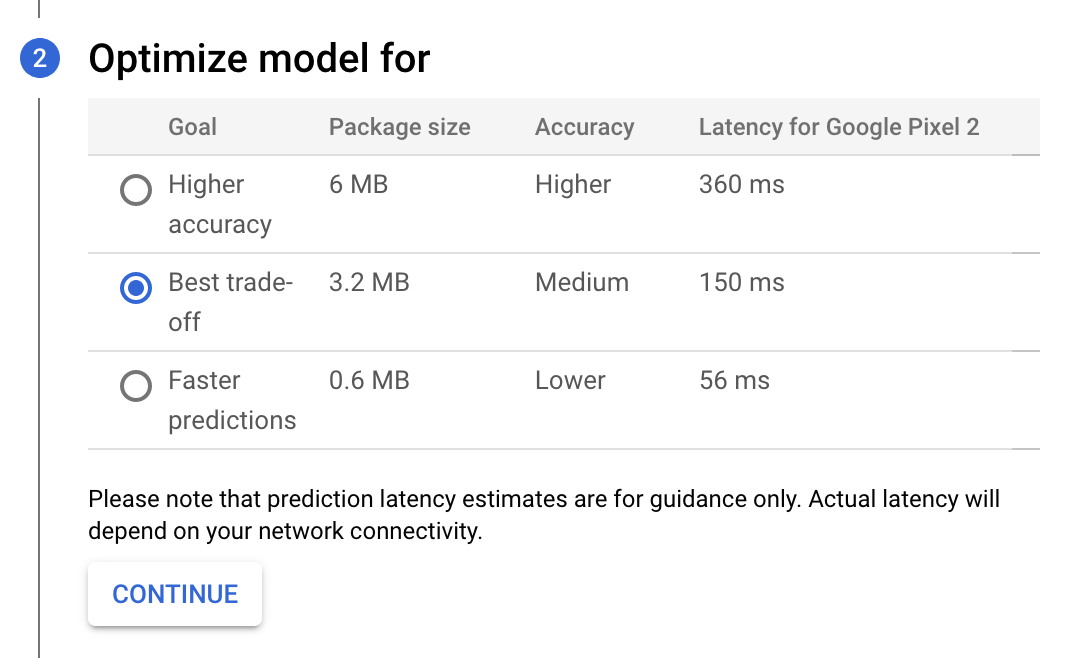
sudo xcrun gem install cocoapods

Create a dataset and import flower\_photos.zip to it.

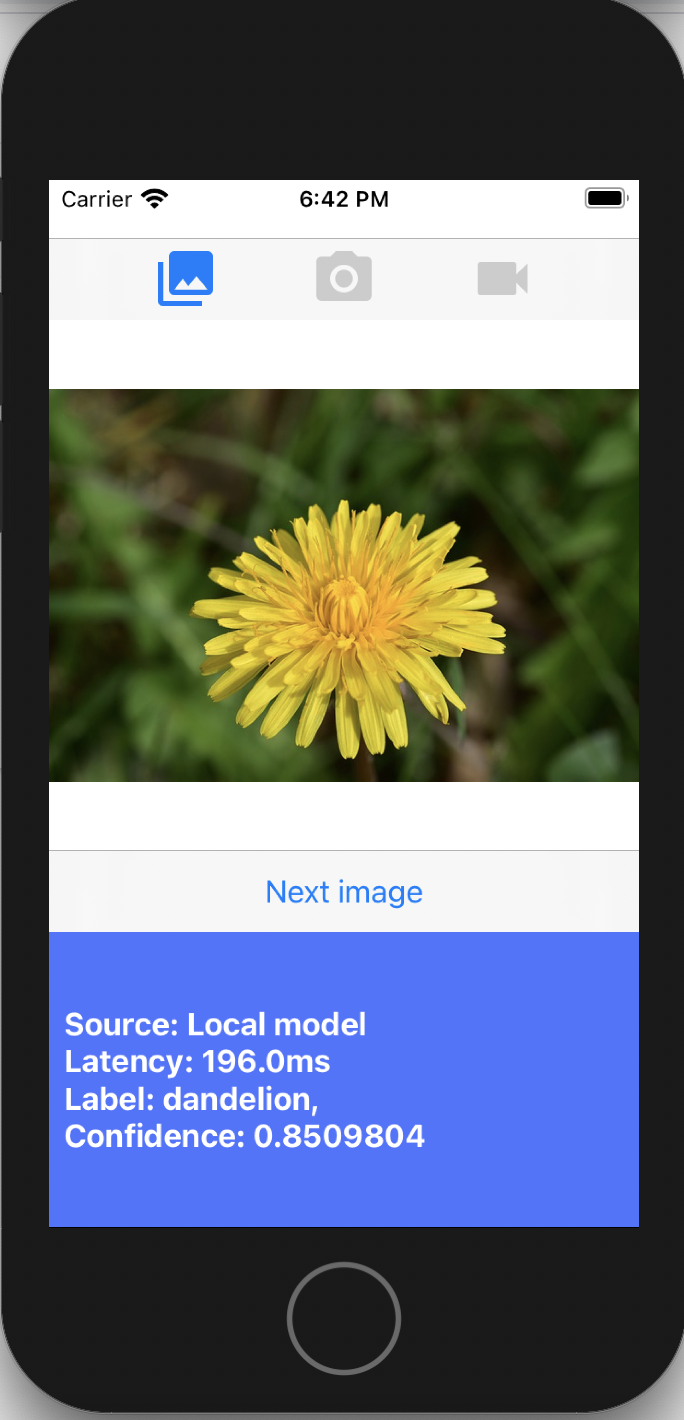


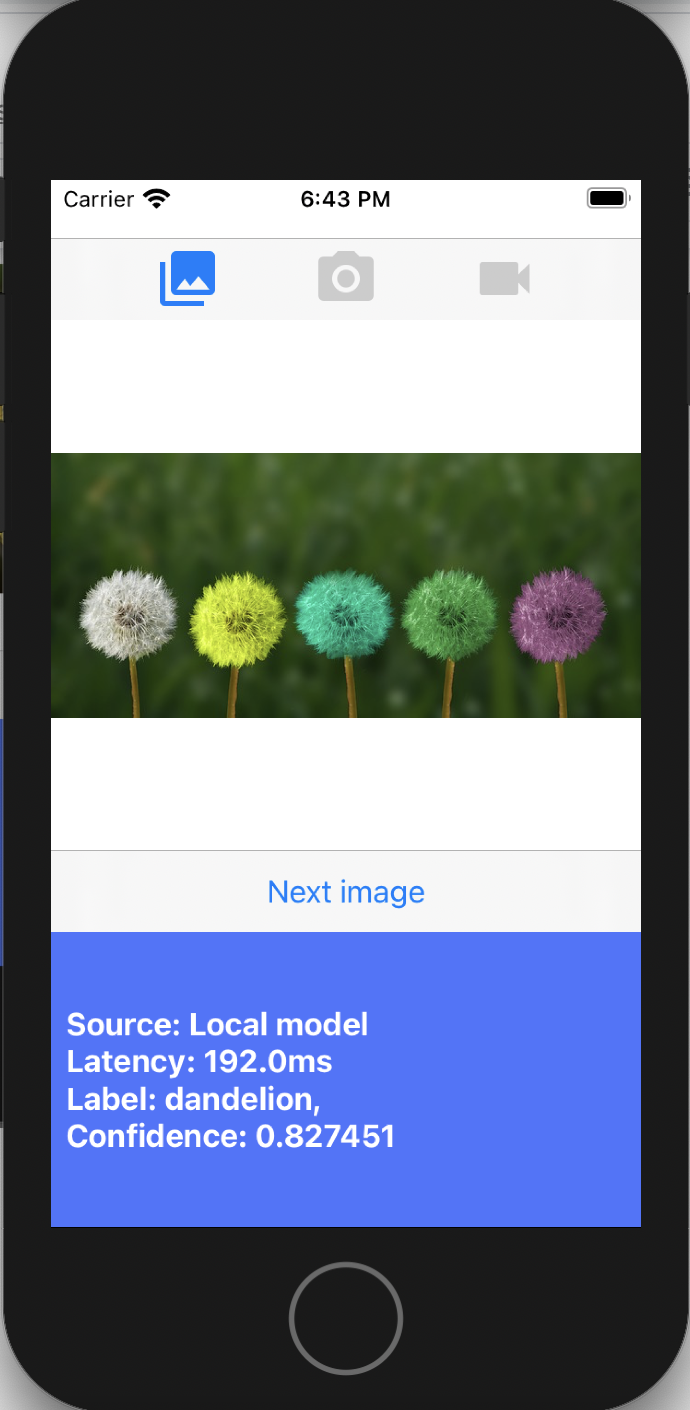






## Download image classification model after training





Conclusion

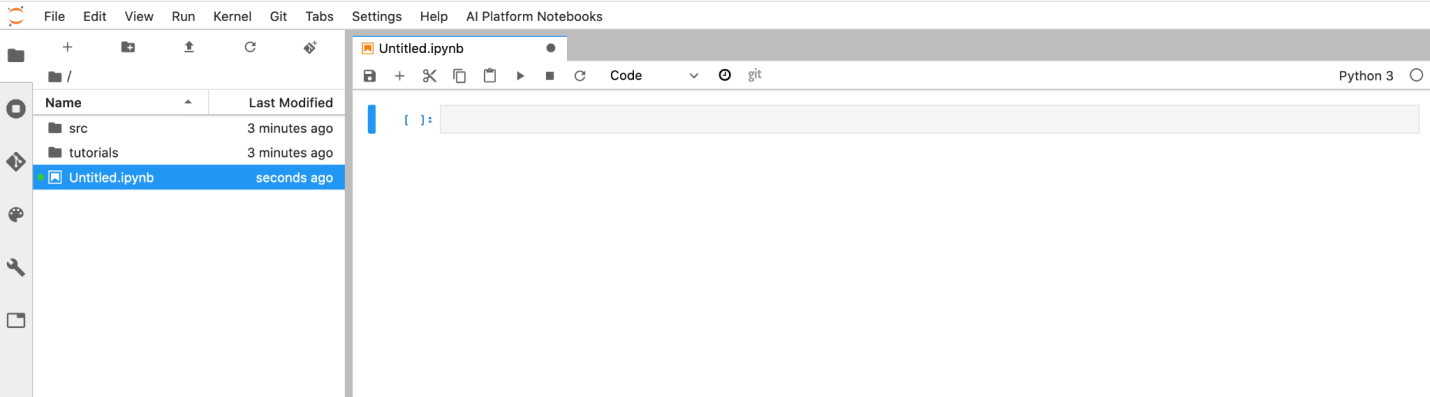
I have gone through an end-to-end journey of training an image classification model with the training data using AutoML, and then use the model in a mobile app using ML Kit.

### Series Forecasting Auto ML

Create a new instance, select the latest TensorFlow Enterprise 2.x instance type without GPUs:



Create a **Python 3** notebook from JupyterLab:



## **Download lab materials**

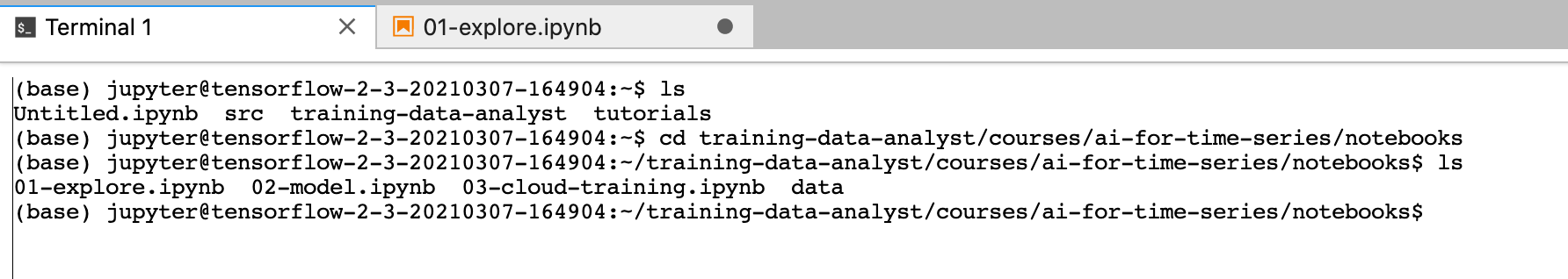
Create a new Terminal window from the JupyterLab interface: File -> New -> Terminal.

From there, clone the source material with this command:

Create a new terminal, File -> New -> Terminal

And clone the code from github:

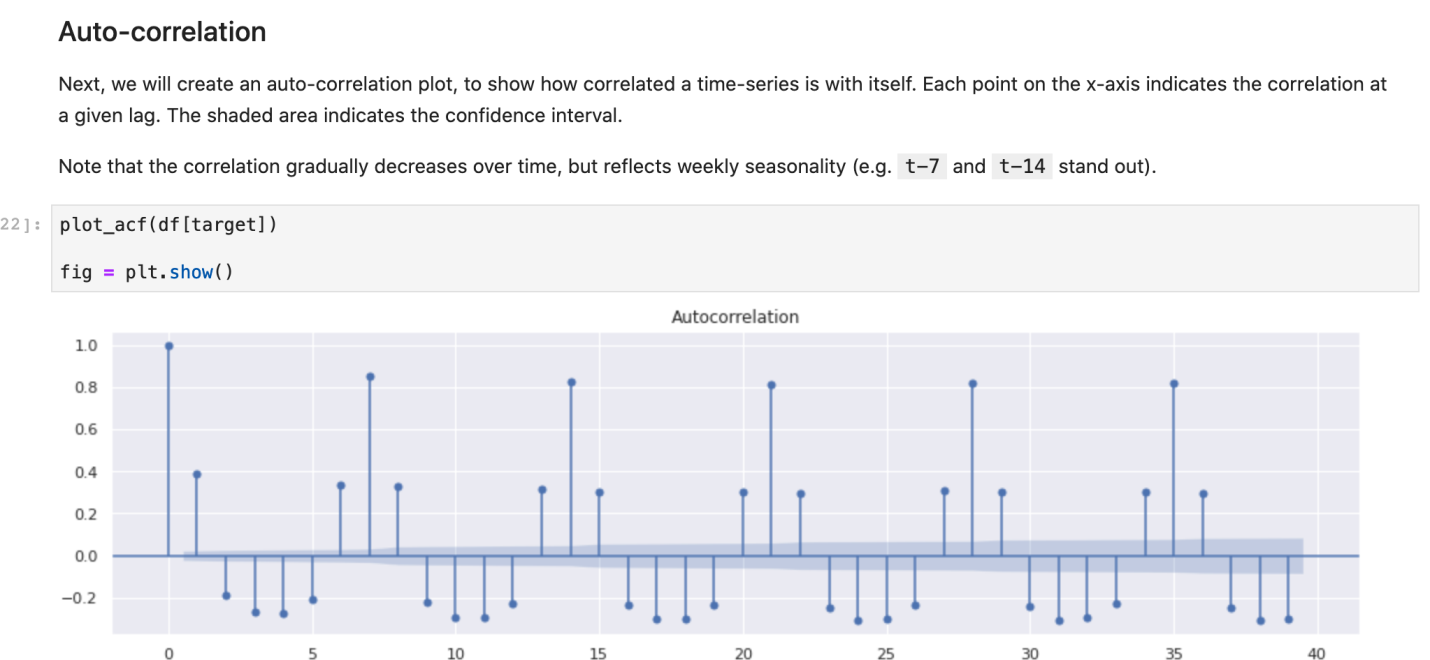
git clone https://github.com/GoogleCloudPlatform/training-data-analyst



## 

In AI Platform Notebook, navigate to training-data-analyst/courses/ai-for-time-series/notebooks and open 01-explore.ipynb.

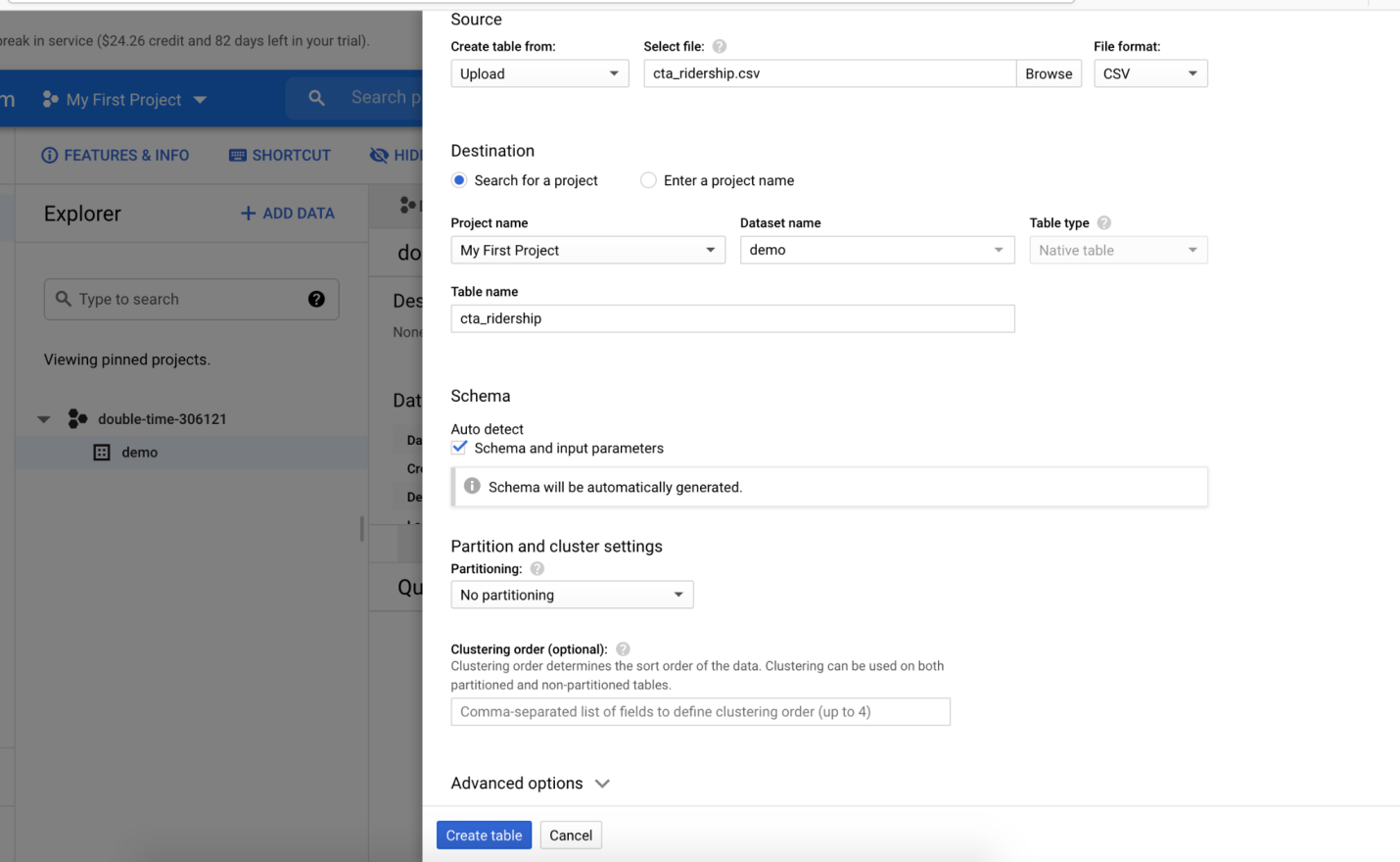
Clear all the cells in the notebook (Edit > Clear All Outputs), change the region, project and bucket settings in one of the first few cells, and then Run the cells one by one.



## **Create a Model with BigQuery Time Series Forecasting**

Create table with: https://github.com/GoogleCloudPlatform/training-data-analyst

training-data-analyst/courses/ai-for-time-series/notebooks/data/cta\_ridership.csv





[BigQuery ML](https://cloud.google.com/bigquery-ml/docs/introduction?utm_campaign=CDR_kwe_aiml_time-series-forecasting_011521&utm_source=external&utm_medium=web) provides a straightforward syntax similar to SQL that enables you to create a wide variety of model types.

Put below in query editor:  
CREATE OR REPLACE MODEL

`demo.cta\_ridership\_model` OPTIONS(MODEL\_TYPE='ARIMA',

TIME\_SERIES\_TIMESTAMP\_COL='service\_date',

TIME\_SERIES\_DATA\_COL='total\_rides',

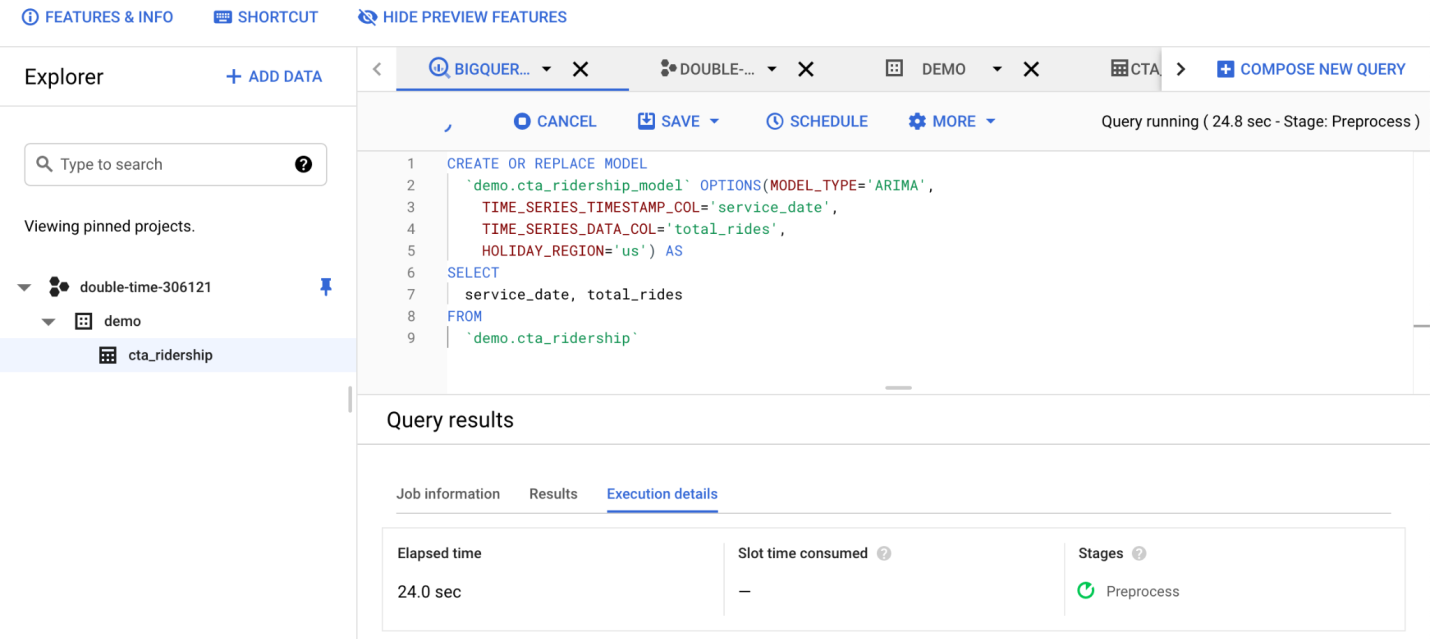
HOLIDAY\_REGION='us') AS

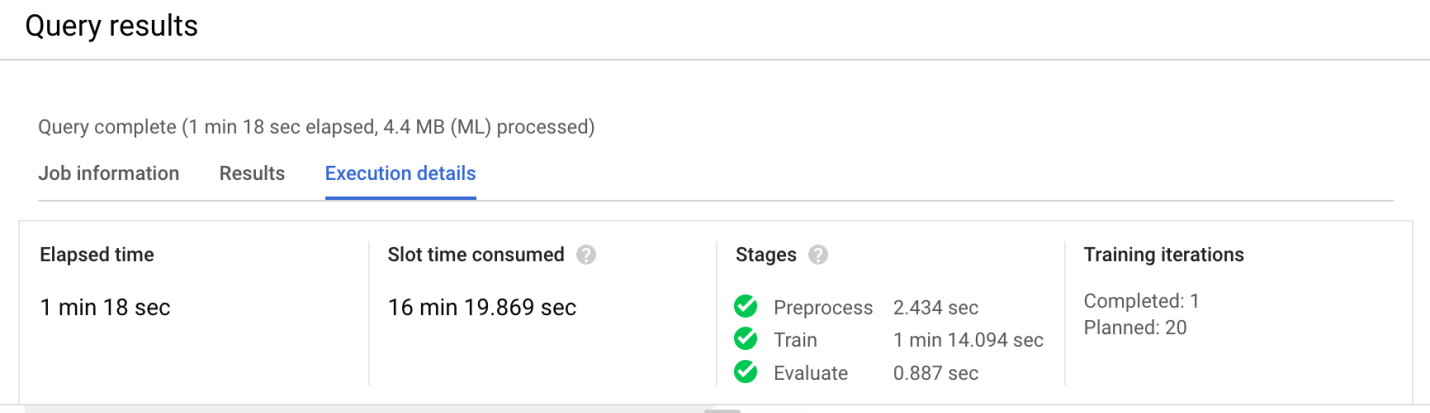
SELECT

service\_date, total\_rides

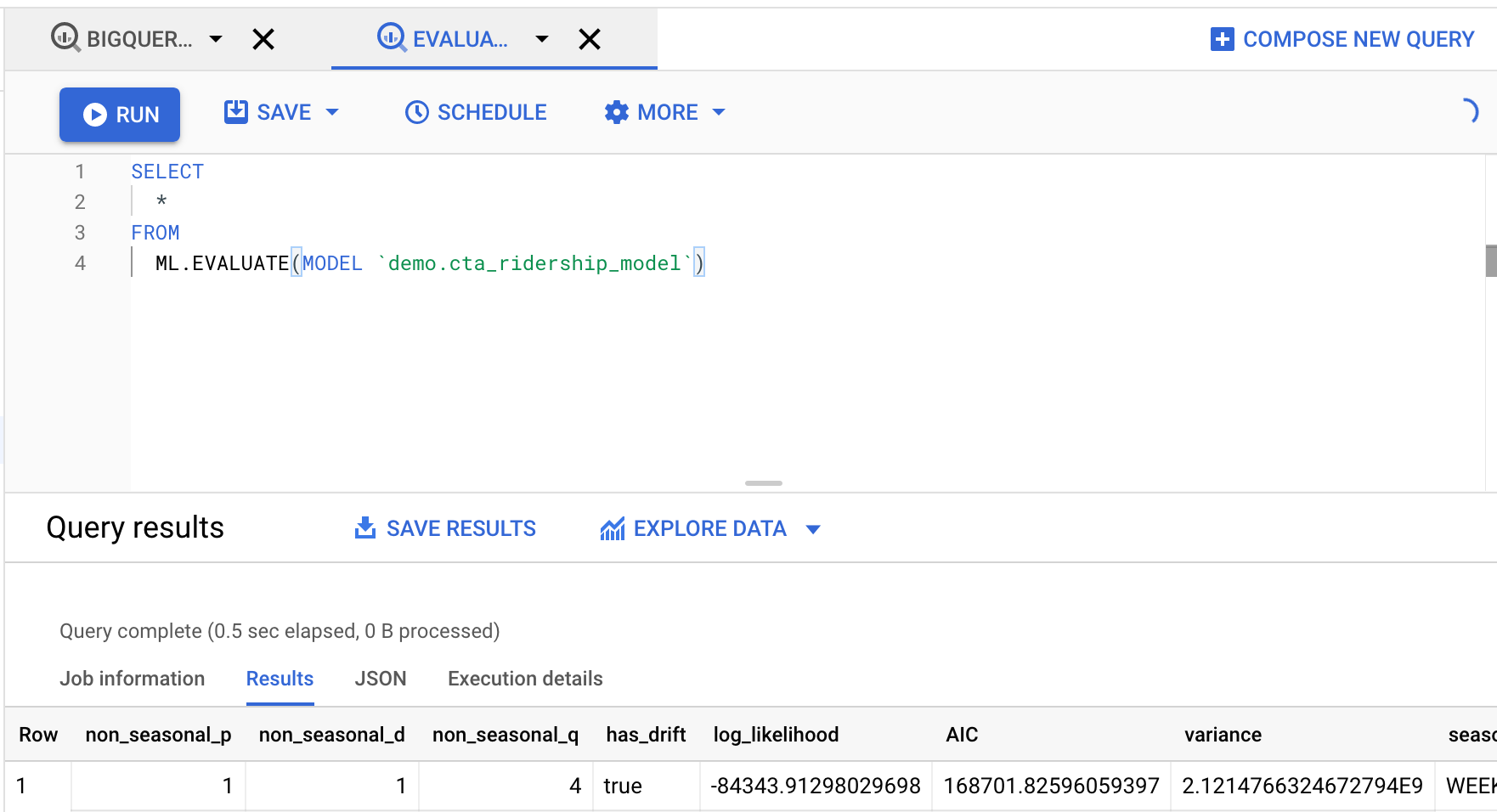
FROM

`demo.cta\_ridership`

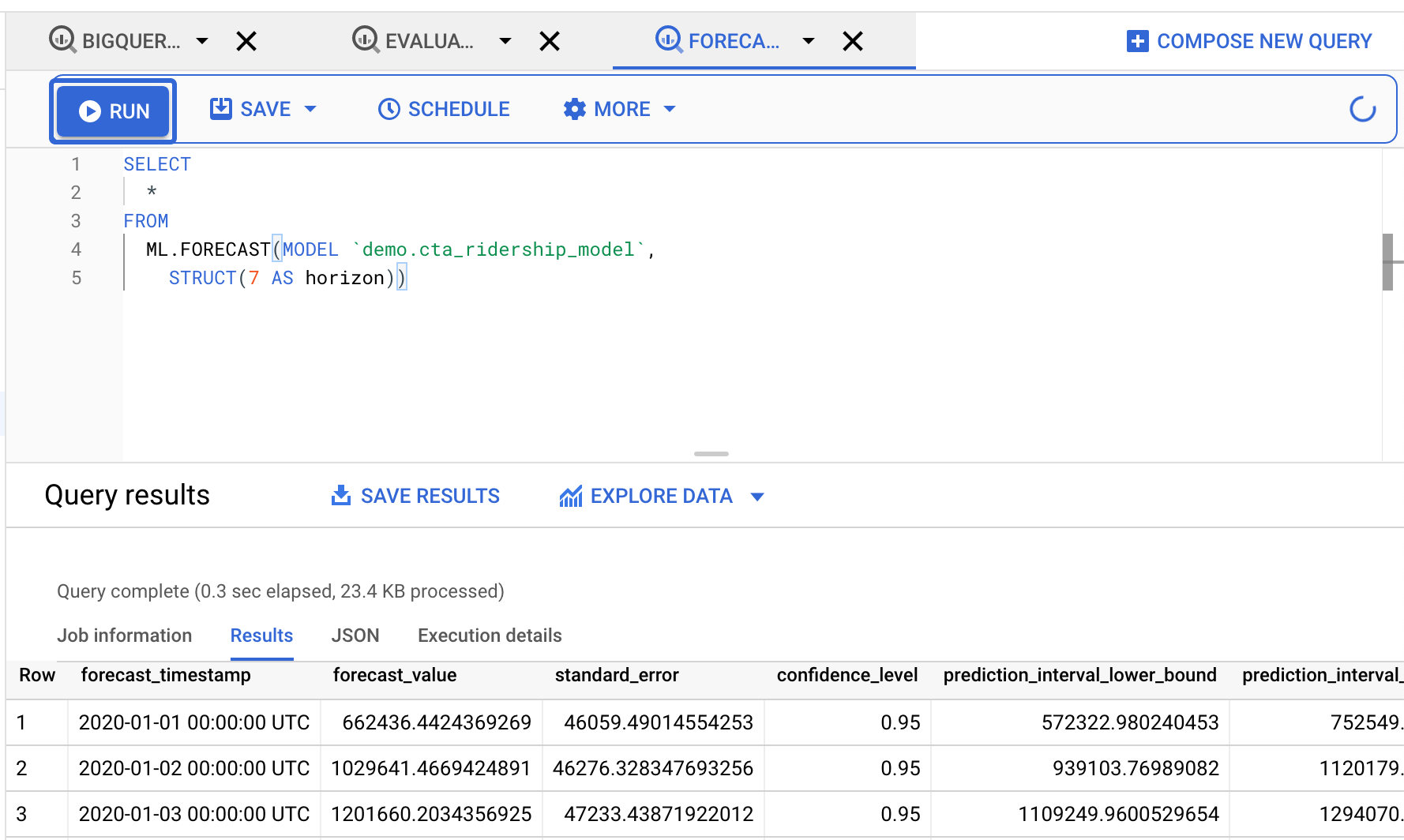




When it is finished, create a query to evaluate the model:



Create a query for forecast



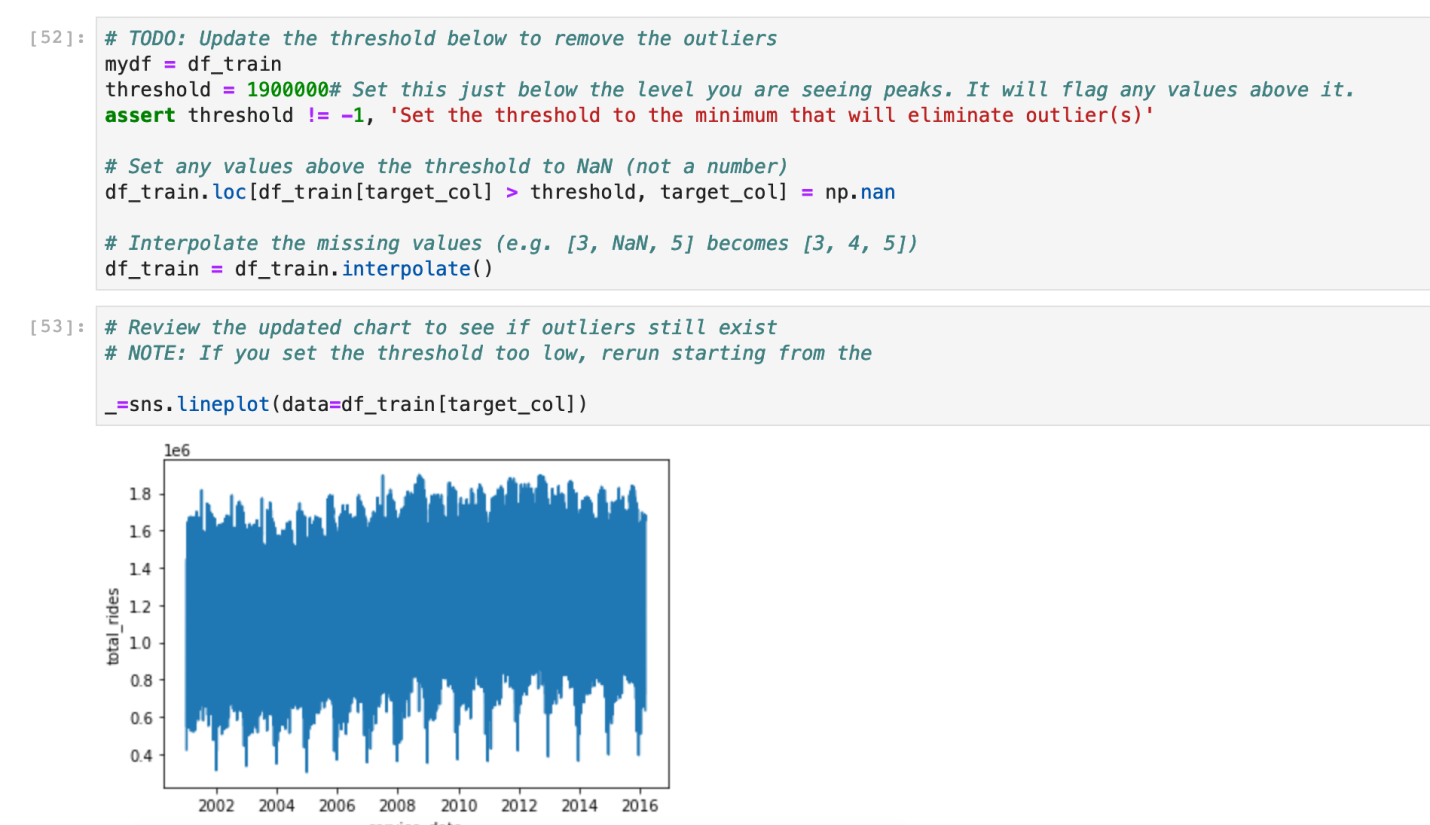
We have created a time series model with just a few BQML queries.

## **Build a Custom Forecasting Model**

In this lab, we will:

* Remove outliers from the data
* Perform multi-step forecasting
* Include additional features in a time-series model
* Learn about neural network architectures for time-series forecasting: LSTM and CNN
* Learn about statistical models, including Holt-Winters Exponential Smoothing
* Ensemble models

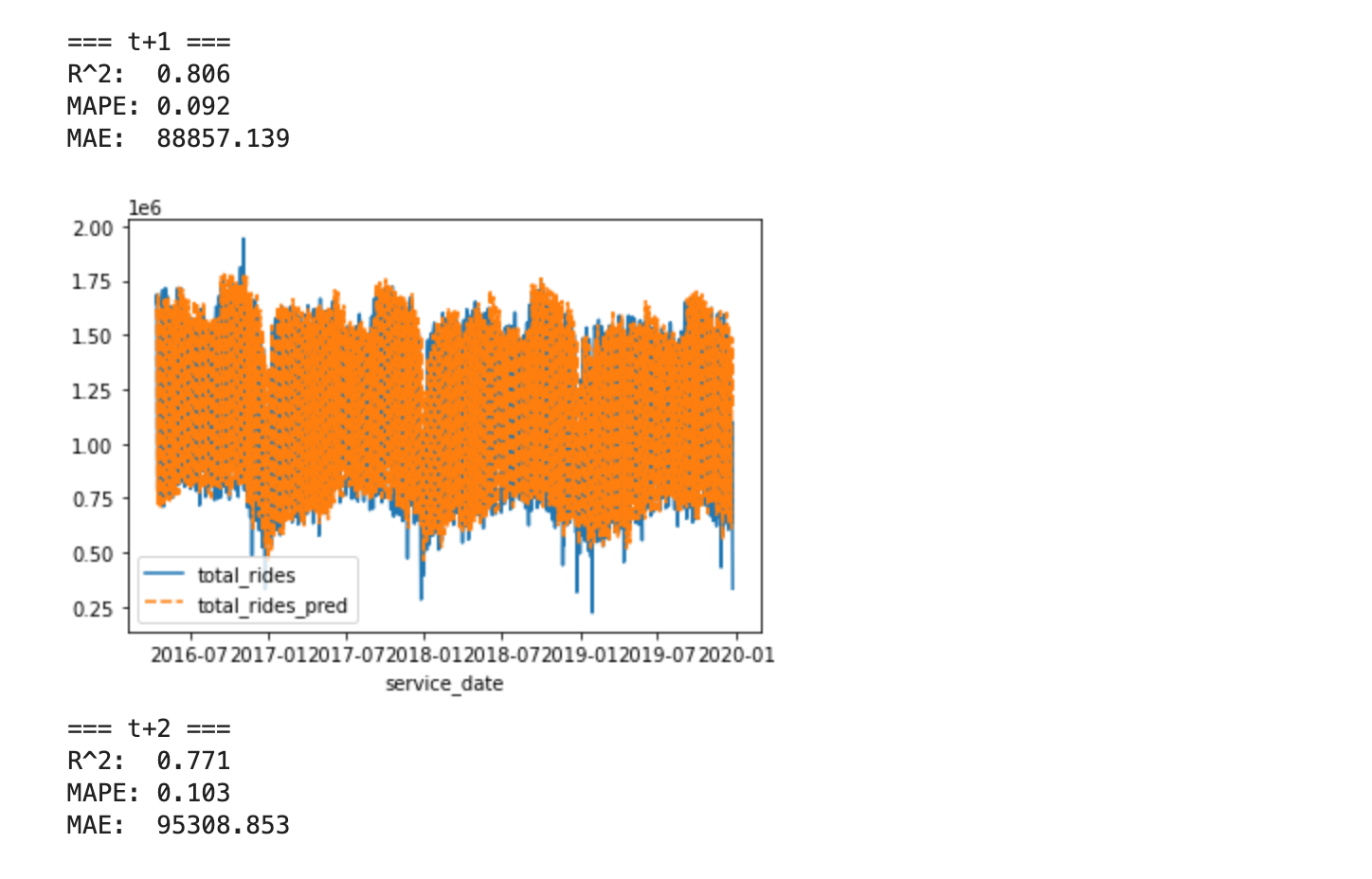
### **Remove outliers**



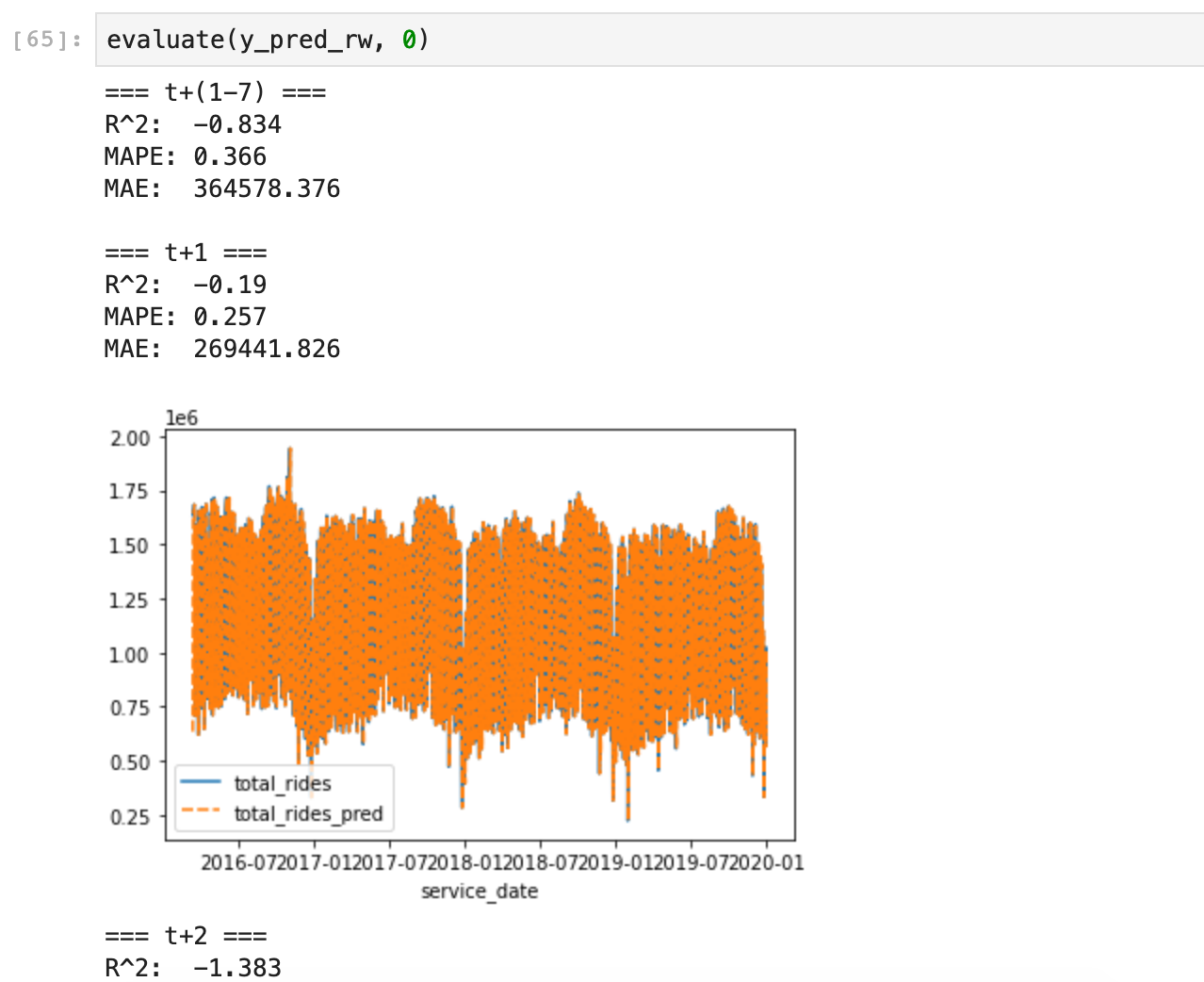
### **Long Short Term Memory (LSTM)**

### 

### **Convolutional Neural Network (CNN)**



### **Naive Model**

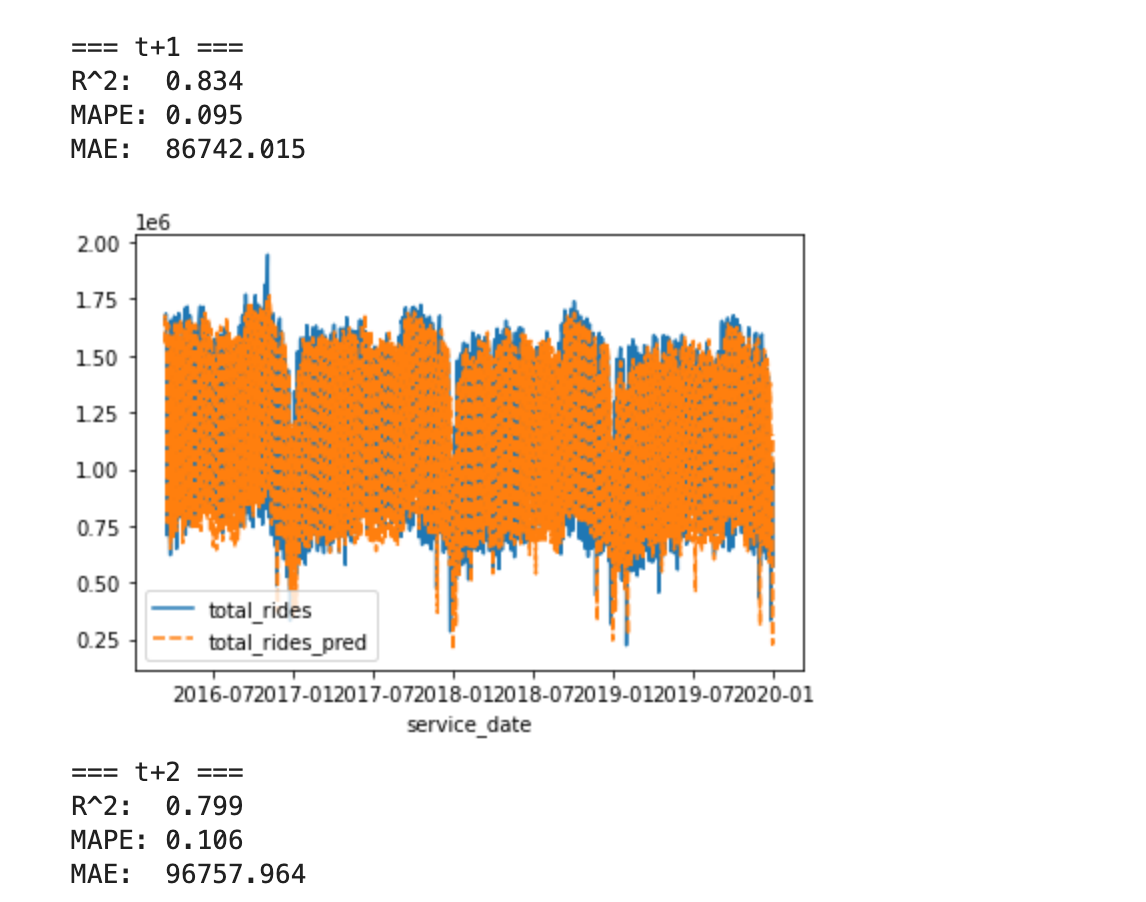


### **Seasonal Naive**

### 

### **Exponential Smoothing**

### 



### **Ensemble ML and Statistical Models**

### 

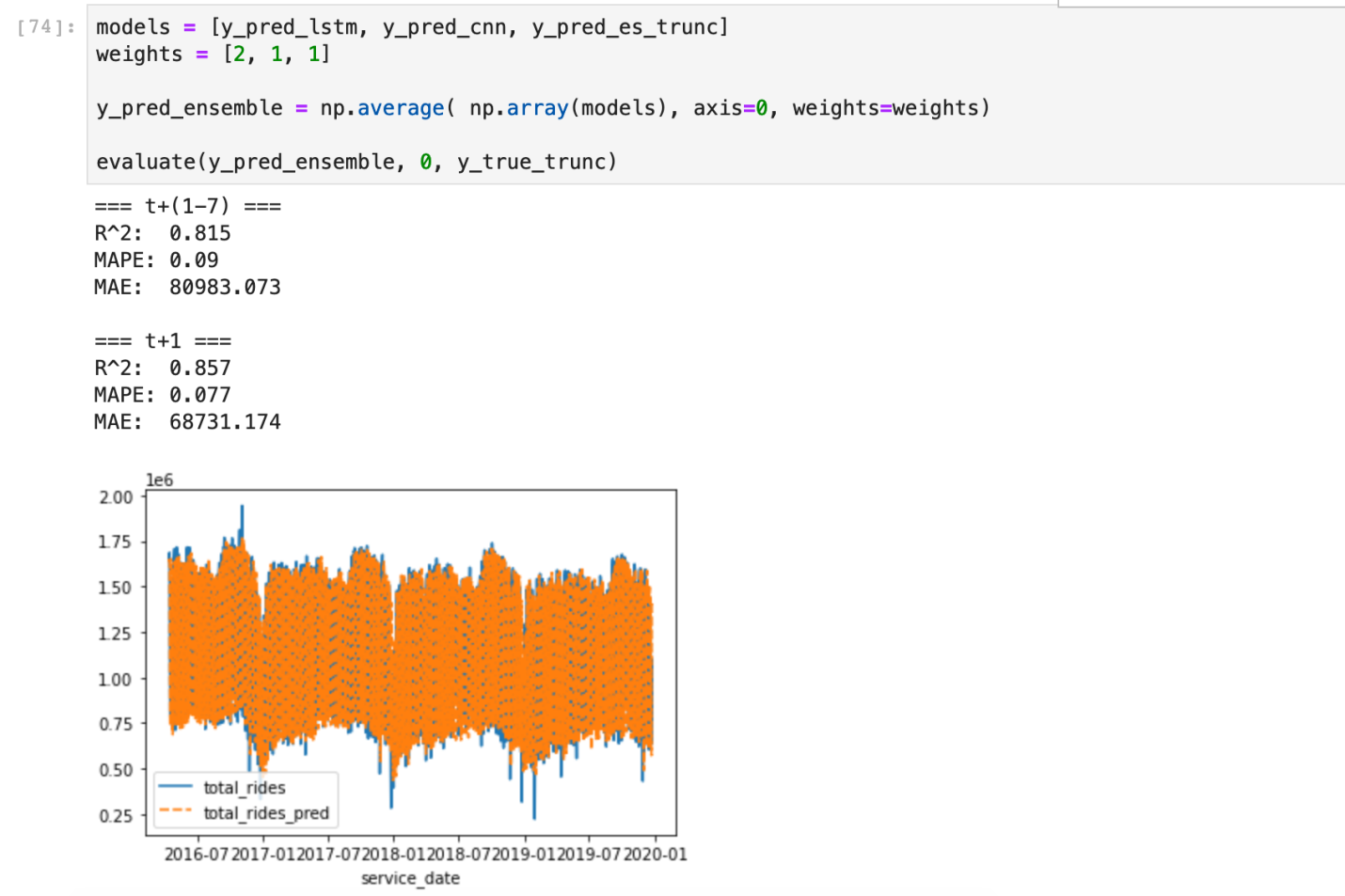
### 

## 

Predict



## **Naïve Models**



## **Train and Predict in the Cloud**

