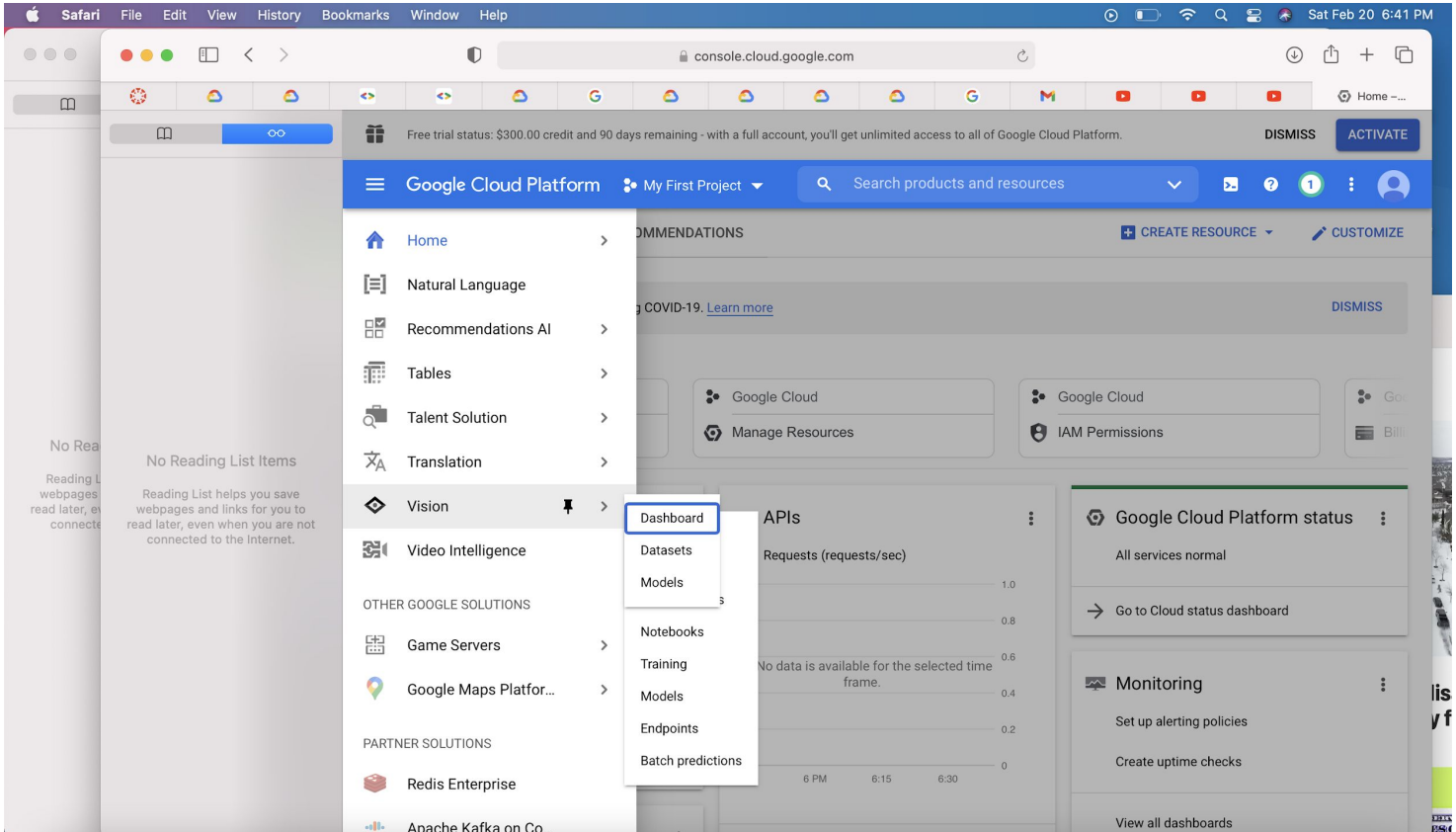
Assignment Auto ML

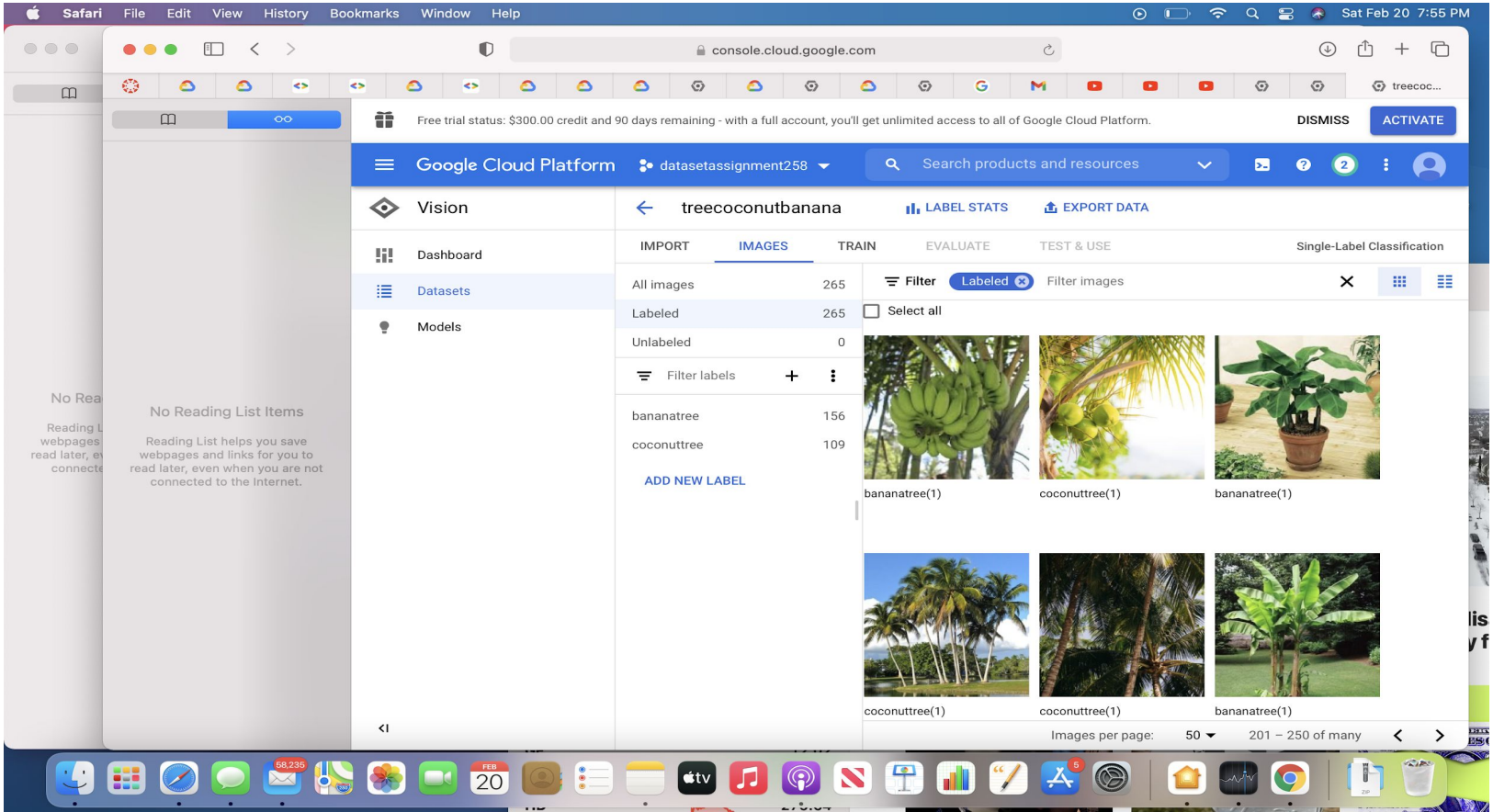
Name Jagruti Mohanty

Part 1 a) Image classification

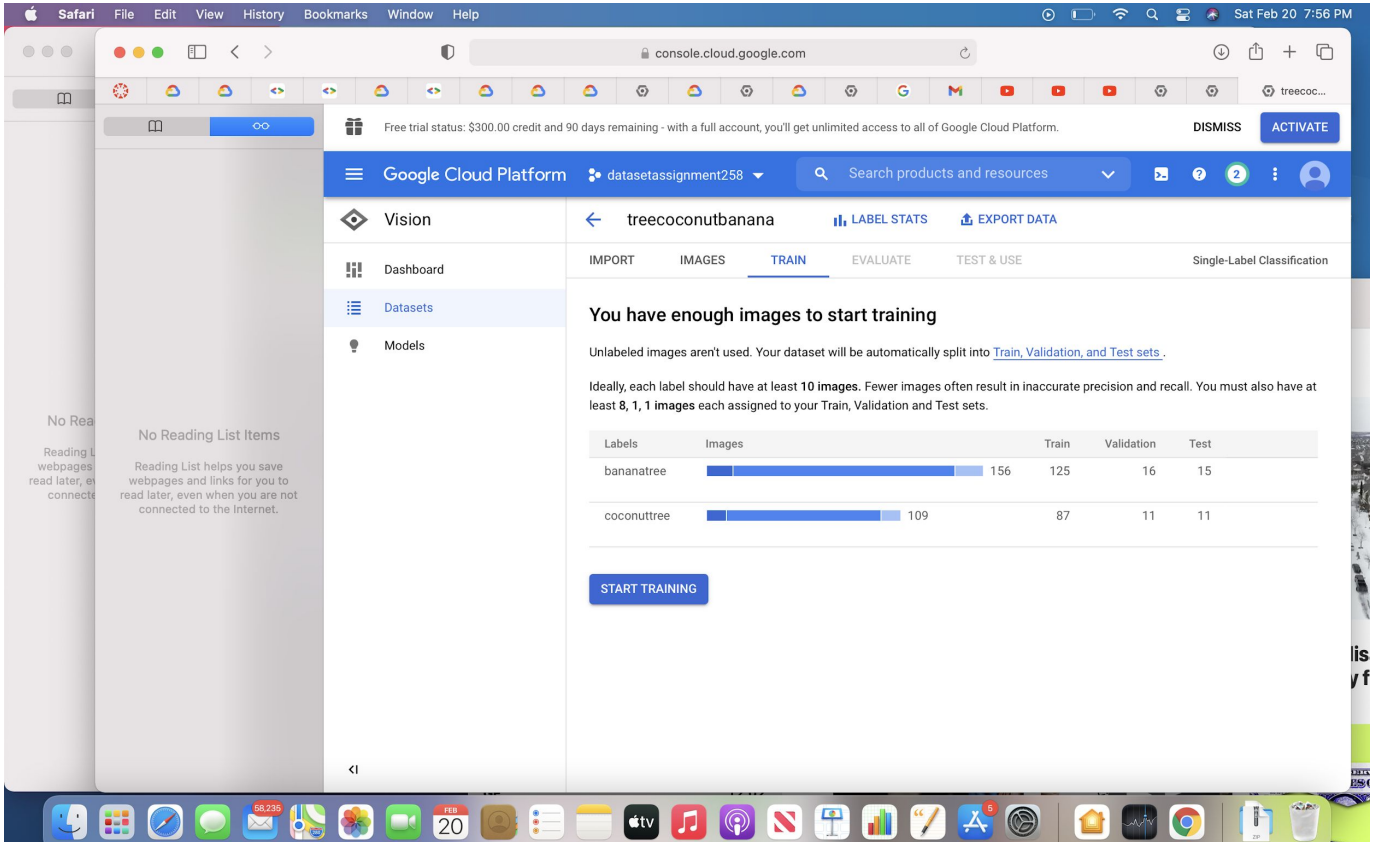
Classification using vision



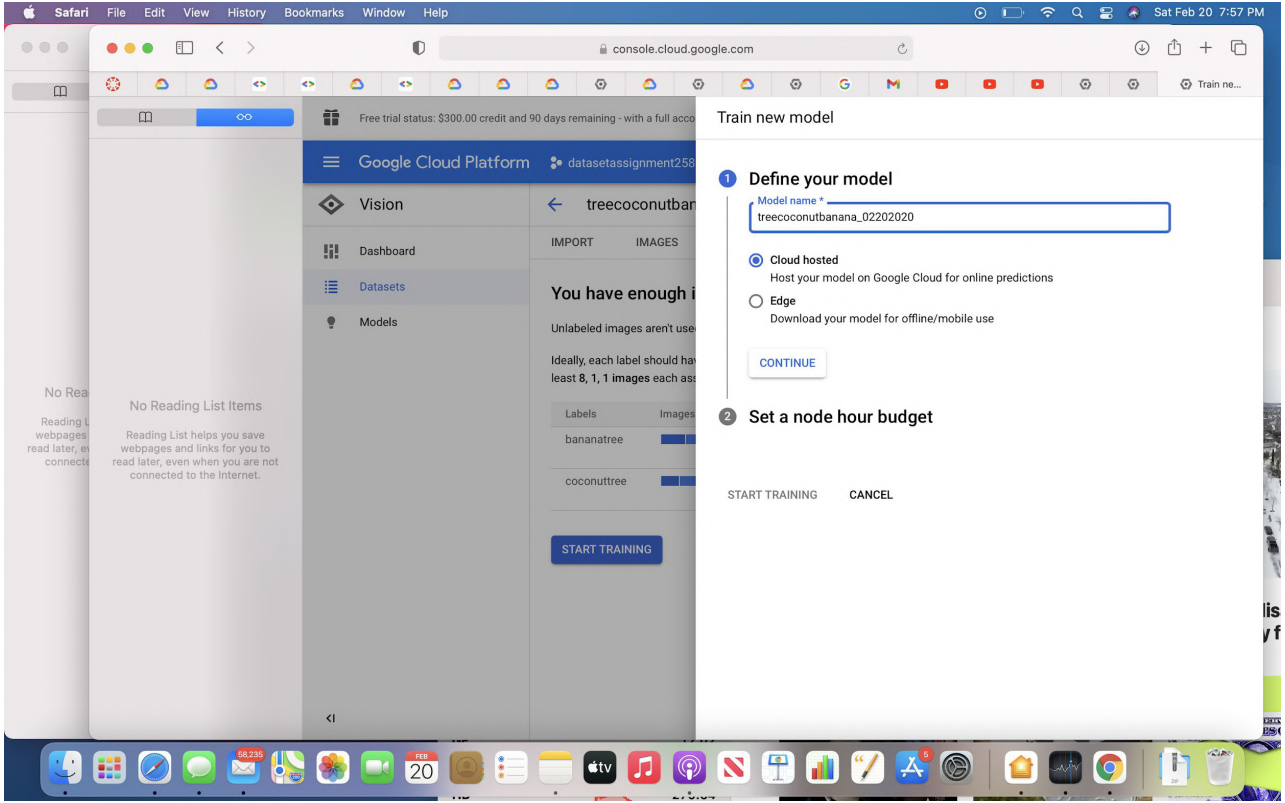
Uploaded Pictures of banana and coconut trees with two labels by downloading the data from google images using imageeye extension

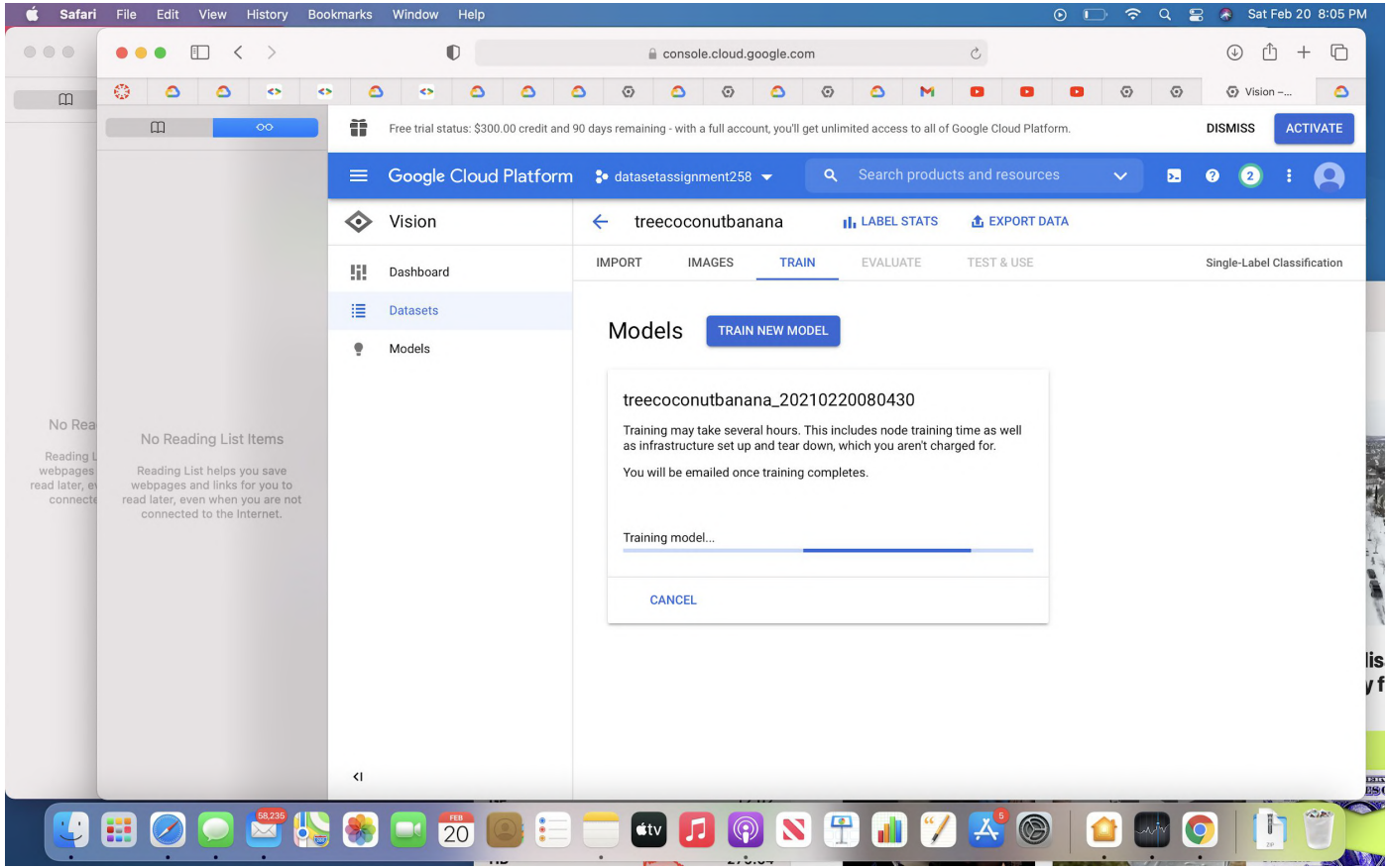


After uploading data



Started training the image classifier model




Safari File Edit View History Bookmarks Window Help
Sat Feb 20 8:05 PM
console.cloud.google.com
Free trial status: $300.00 credit and 90 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform.
DISMISS
ACTIVATE
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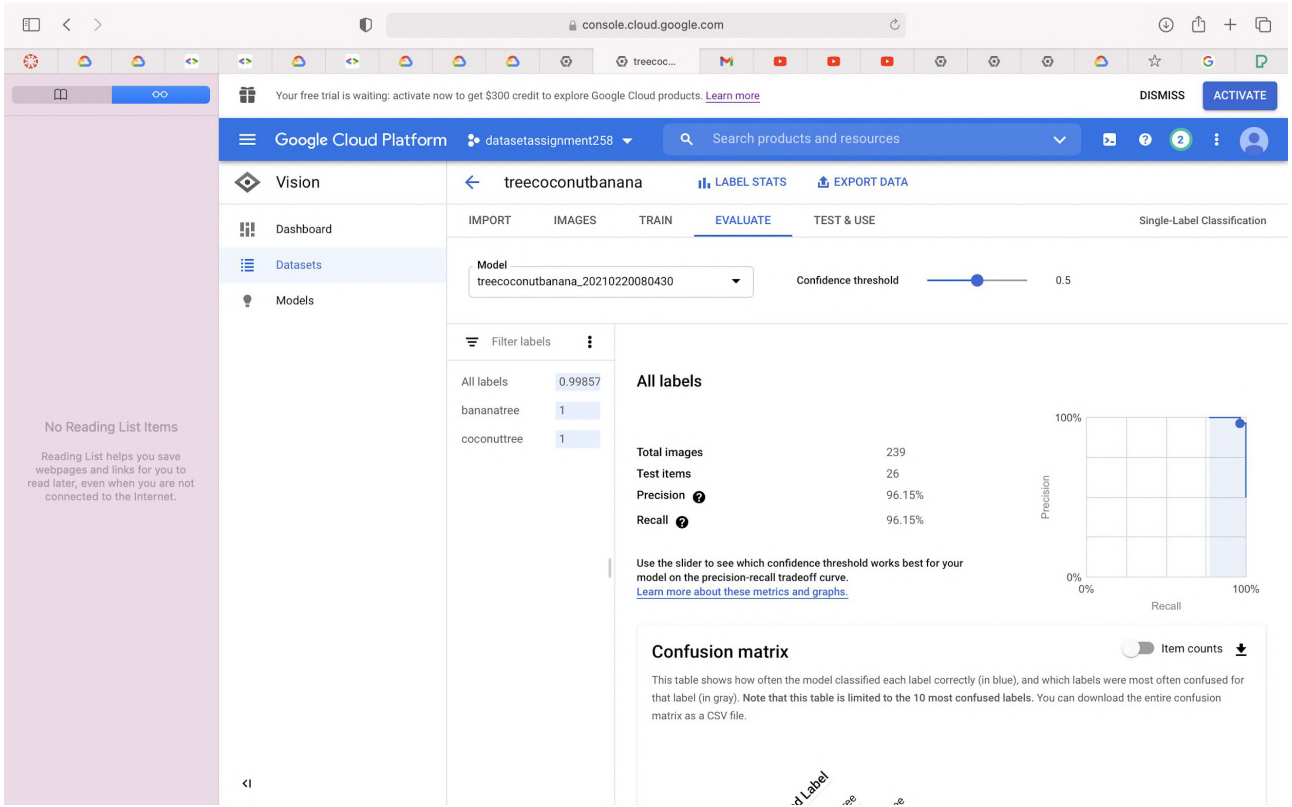
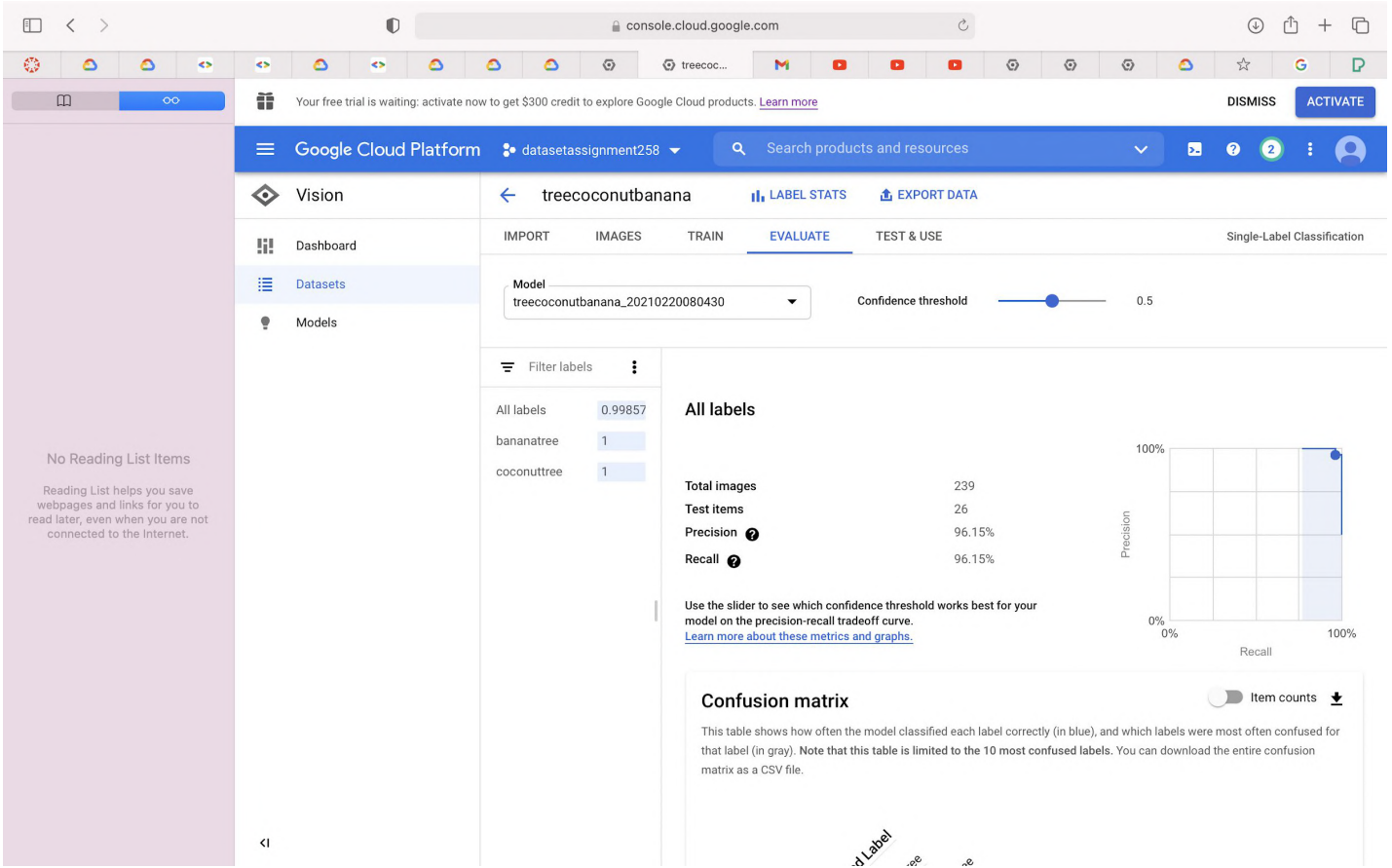
Search products and resources
Vision
Dashboard
Datasets
Models
treecoconutbanana
LABEL STATS
EXPORT DATA
IMPORT
IMAGES
TRAIN
EVALUATE
TEST & USE
Single-Label Classification
Models
TRAIN NEW MODEL
treecoconutbanana_20210220080430
Training may take several hours. This includes node training time as well as infrastructure set up and tear down, which you aren't charged for.
You will be emailed once training completes.
Training model...
CANCEL
No Reading List Items
Reading List helps you save webpages and links for you to read later, even when you are not connected to the Internet.

Model training

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Your free trial is waiting: activate now to get $300 credit to explore Google Cloud products. Learn more
DISMISS
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Dashboard
Datasets
Models
treecoconutbanana
LABEL STATS
EXPORT DATA
IMPORT
IMAGES
TRAIN
EVALUATE
TEST & USE
Single-Label Classification
Model
treecoconutbanana_20210220080430
Confidence threshold
0.5
Filter labels
All labels 0.99857
bananatree 1
coconuttree 1
All labels
Total images 239
Test items 26
Precision 96.15%
Recall 96.15%
Use the slider to see which confidence threshold works best for your model on the precision-recall tradeoff curve.
Learn more about these metrics and graphs.
100%
Precision
0%
0%
100%
Recall
Confusion matrix
Item counts
This table shows how often the model classified each label correctly (in blue), and which labels were most often confused for that label (in gray). Note that this table is limited to the 10 most confused labels. You can download the entire confusion matrix as a CSV file.
No Reading List Items
Reading List helps you save webpages and links for you to read later, even when you are not connected to the Internet.

treecoconutbanana

LABEL STATS EXPORT DATA

IMPORT IMAGES TRAIN EVALUATE TEST & USE Single-Label Classification

Model
treecoconutbanana_20210220080430

Your model is deployed and is available for online prediction requests. Learn more UPDATE DEPLOYMENT REMOVE DEPLOYMENT

Notice for beta users: The v1beta1 API endpoint is scheduled for deletion after GA release. If your beta models have not been redeployed since October 17, 2019, please do so now to avoid interruption when the old service is shut down.

Test your model

UPLOAD IMAGES

Up to 10 images can be uploaded at a time

Use your model

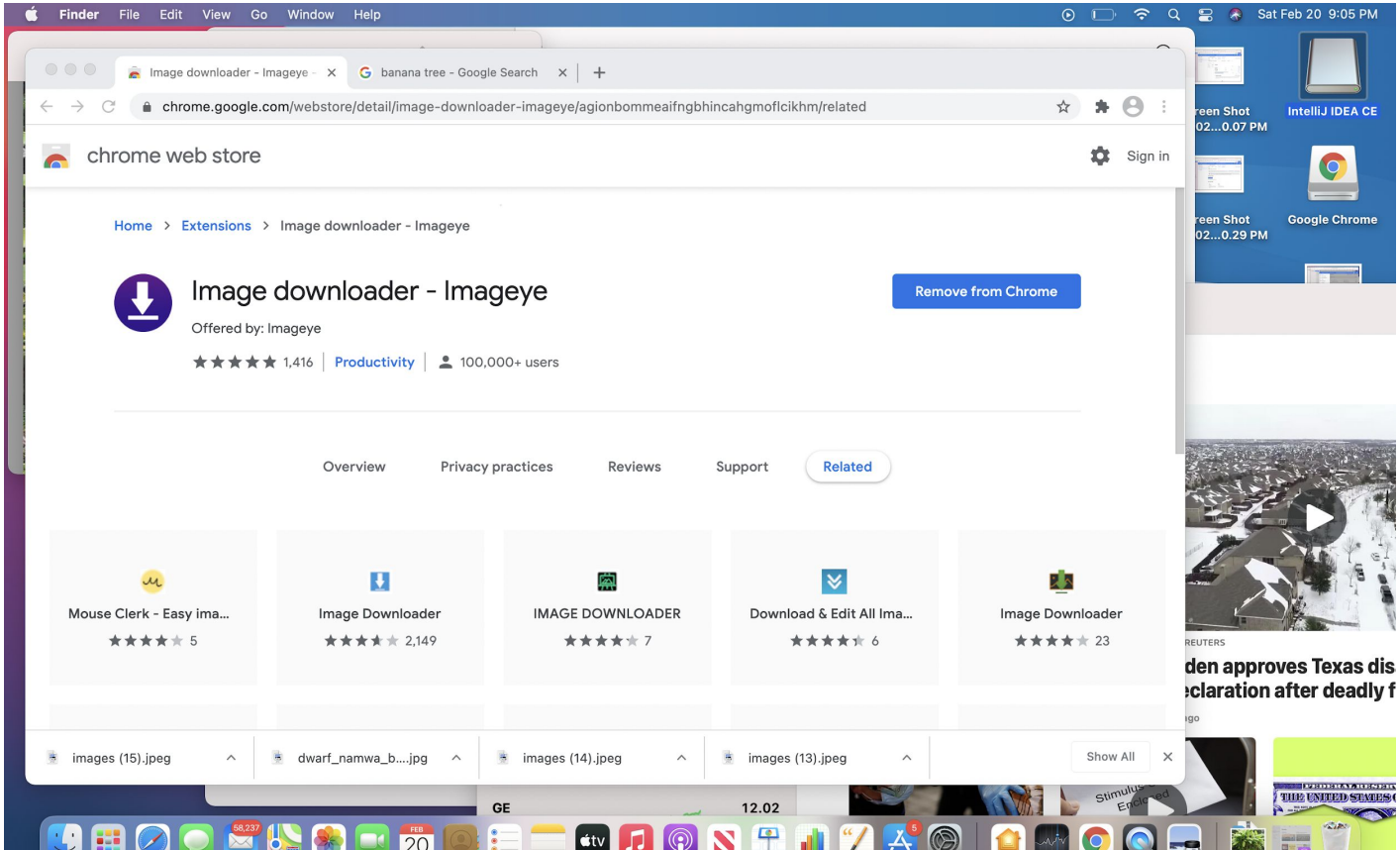
REST API

Use a REST API to get predictions from this model through Google Cloud.

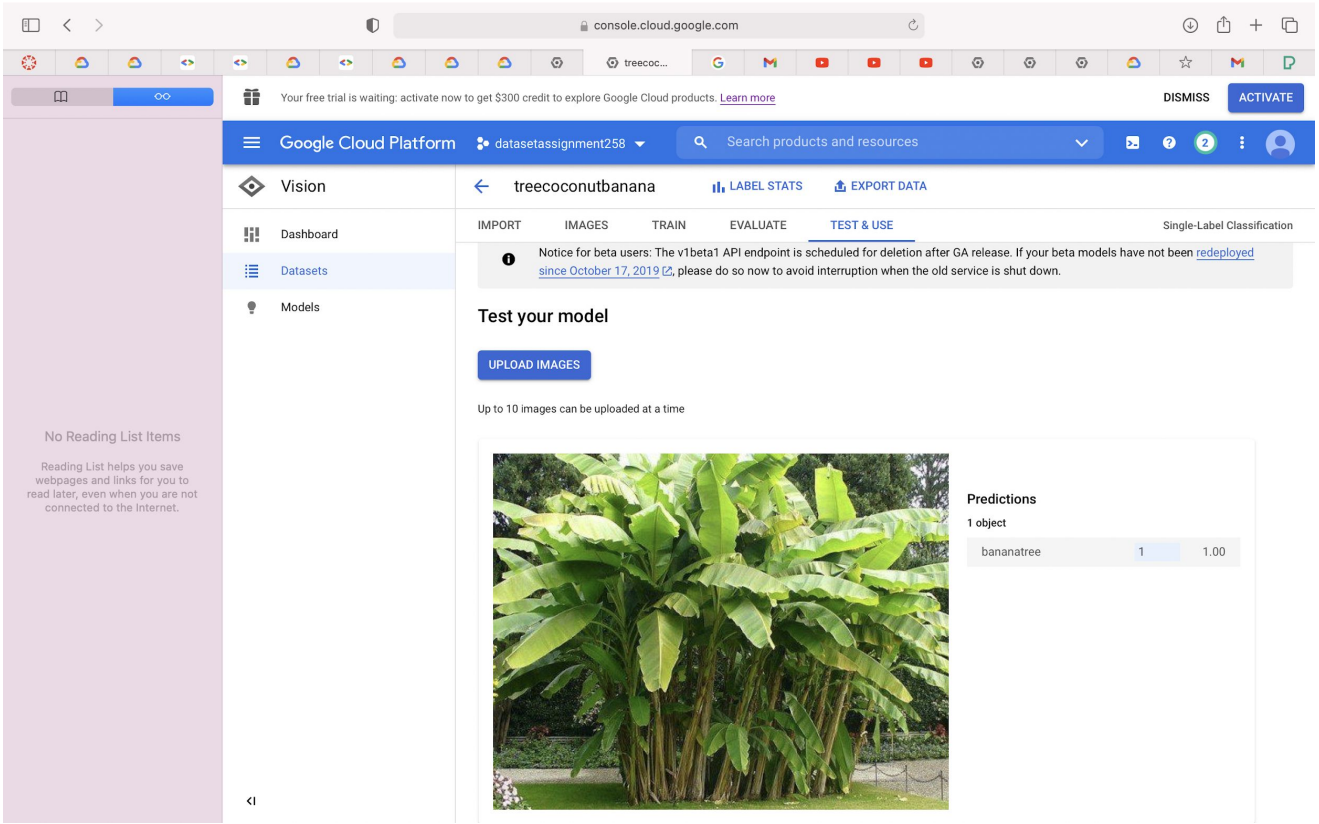
Python

Use a Python client to get predictions from this model.

Imageye extension to download images for trainingset



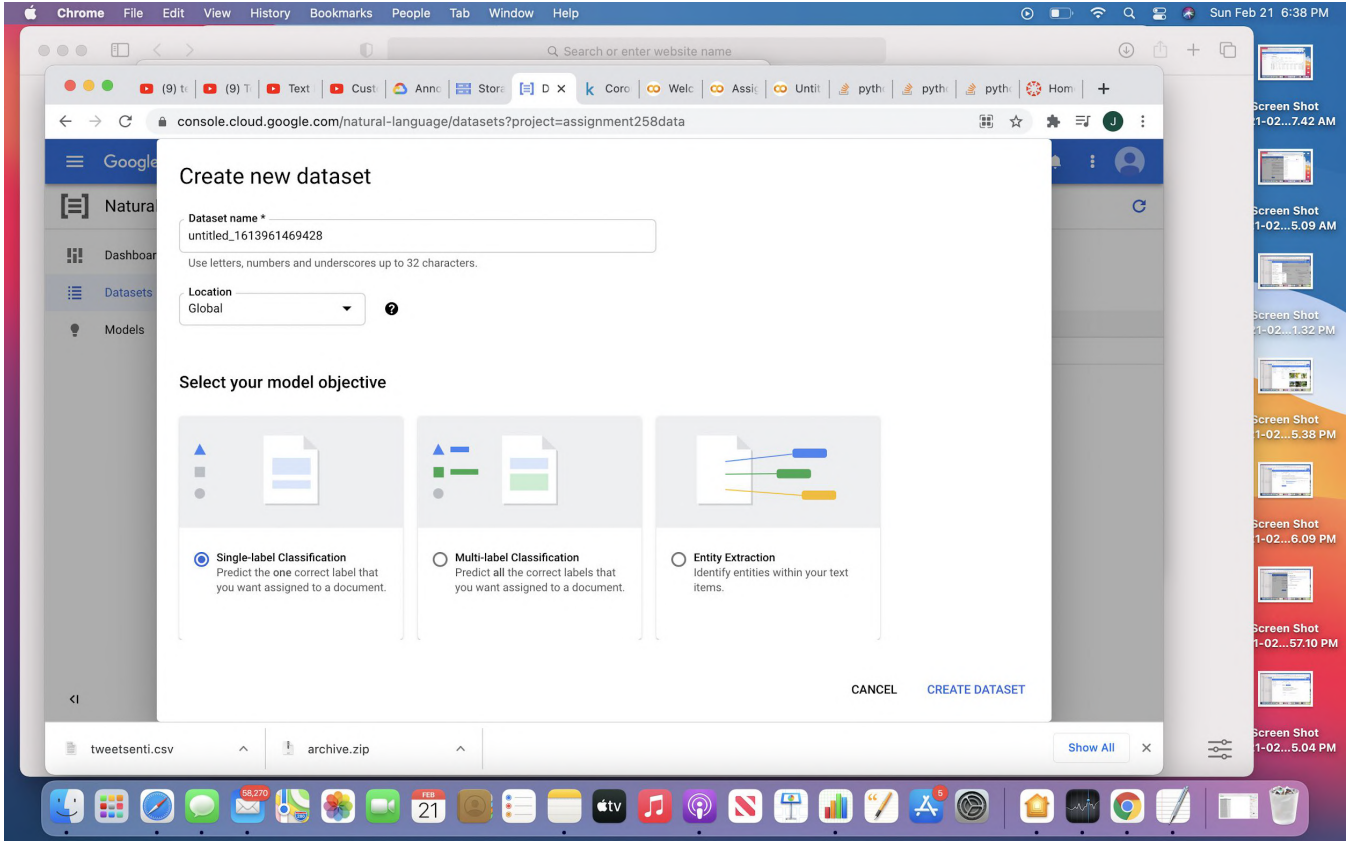
Model prediction output



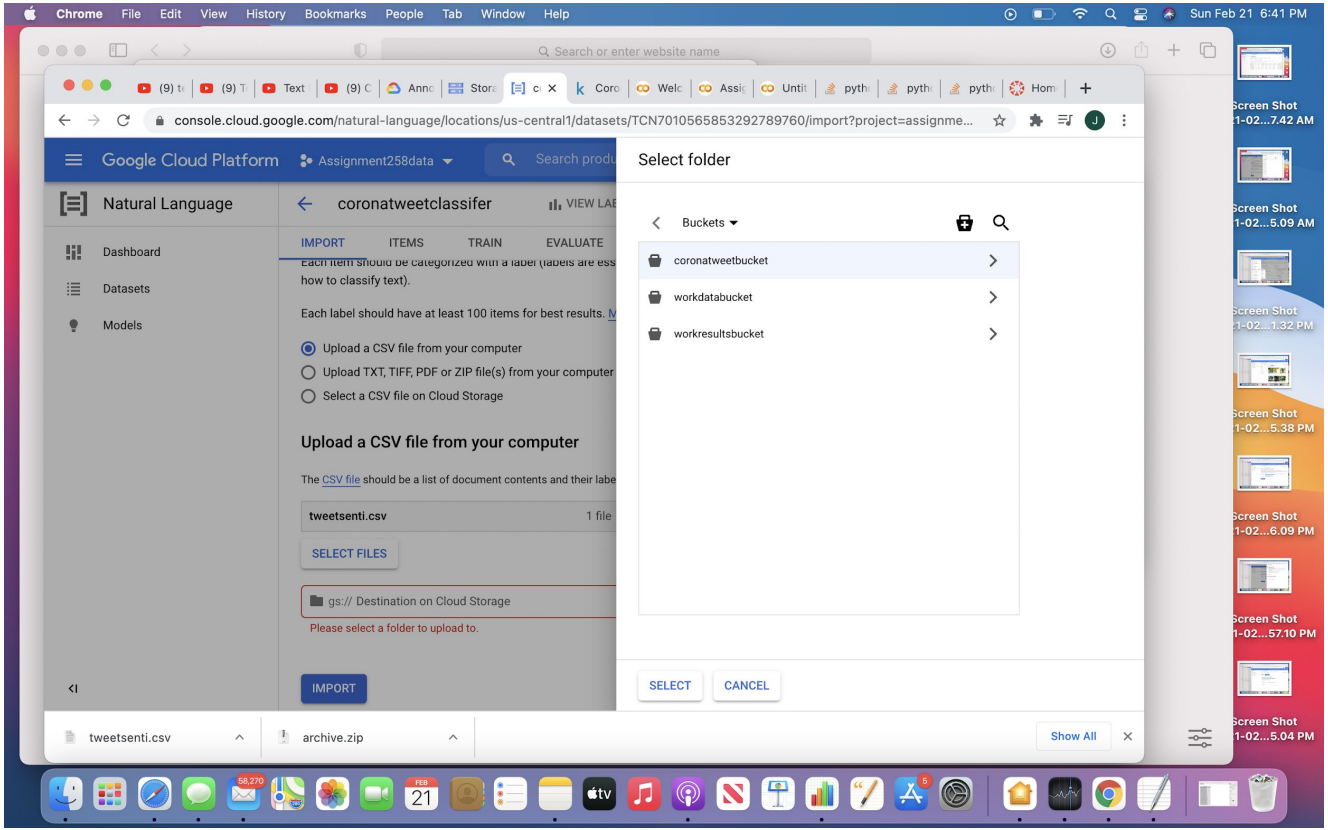
Part 1 b) Text classification

This classifier takes the text input and predicts if the sentiment was very positive , positive , neural , negative or very positive. Input dataset was taken from kaggle.

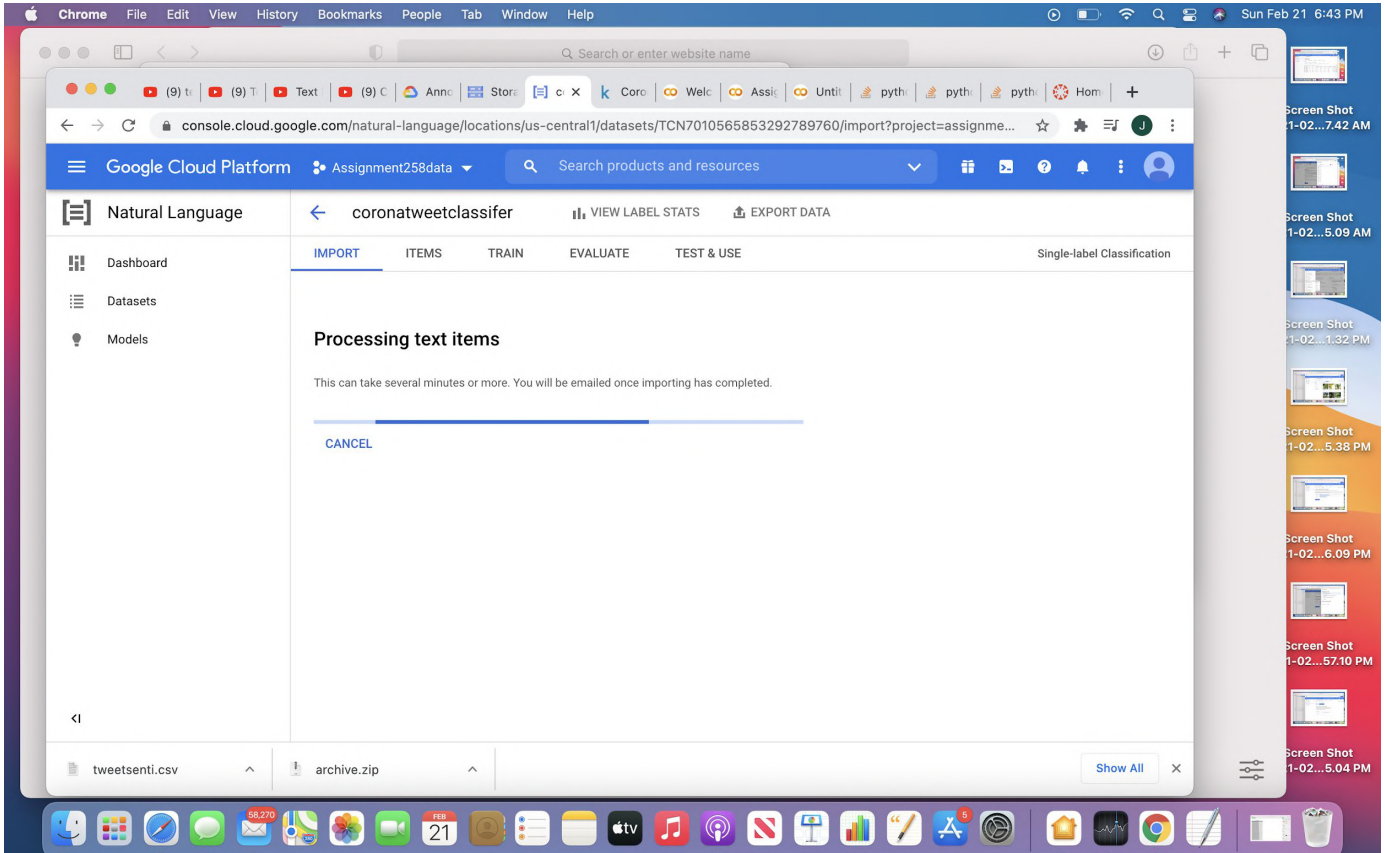
This is a single class classifier for the model to predict the sentiment analysis



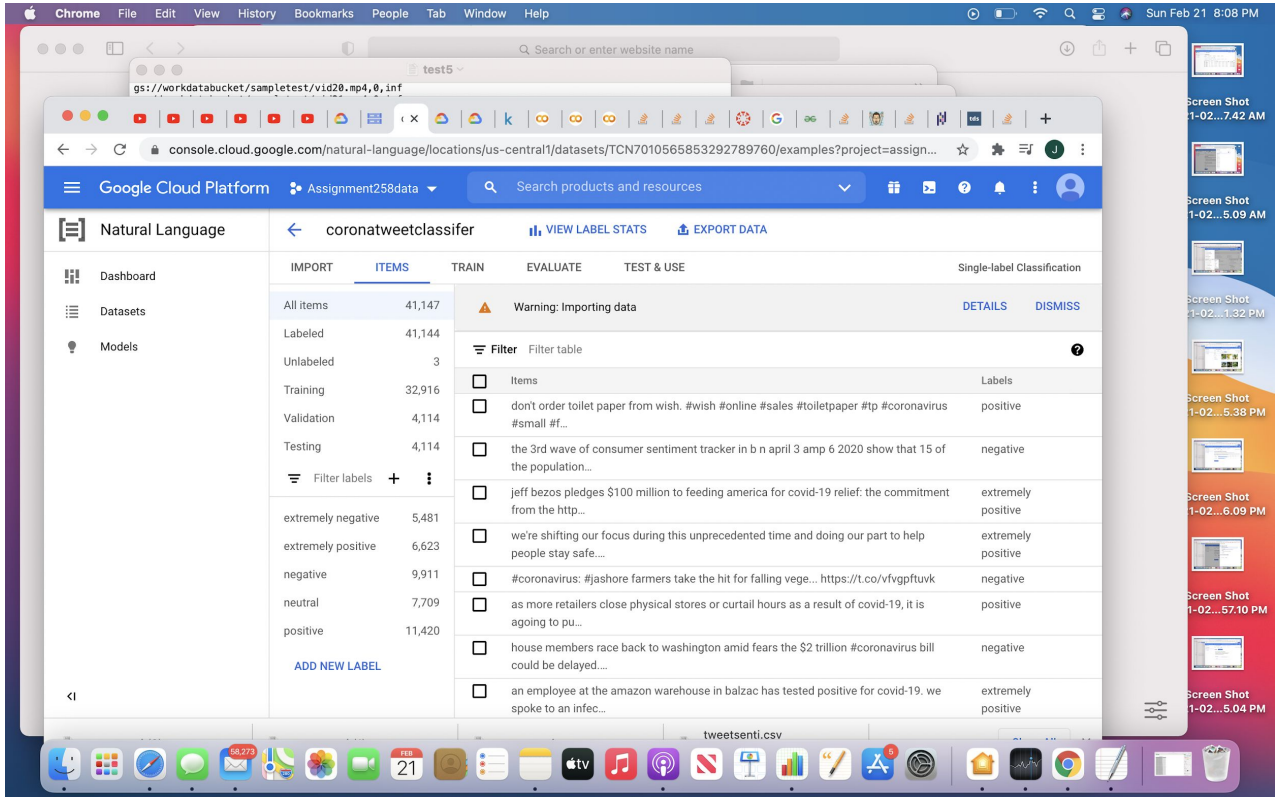
Buckets are to store the dataset and here the training dataset is stored

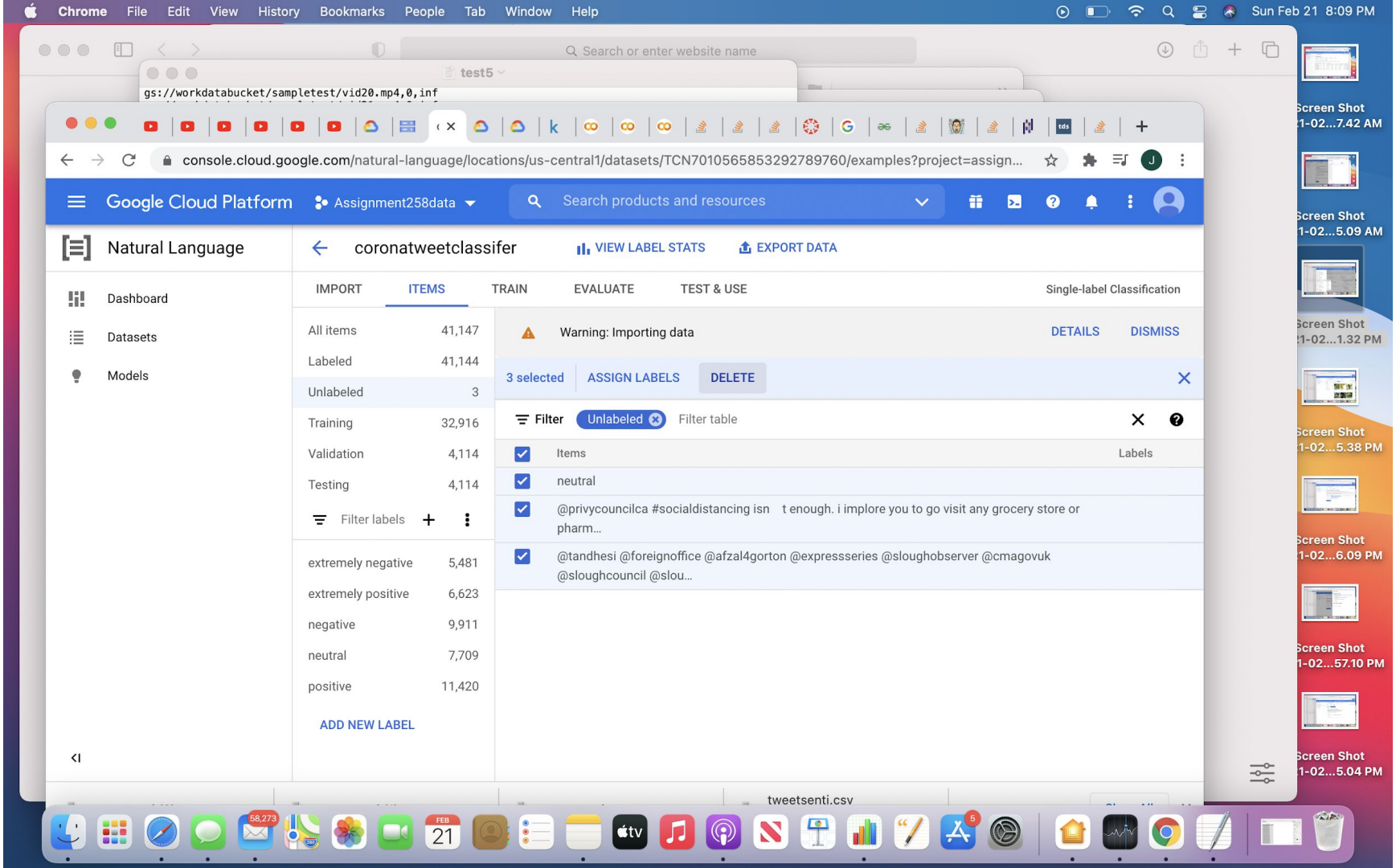


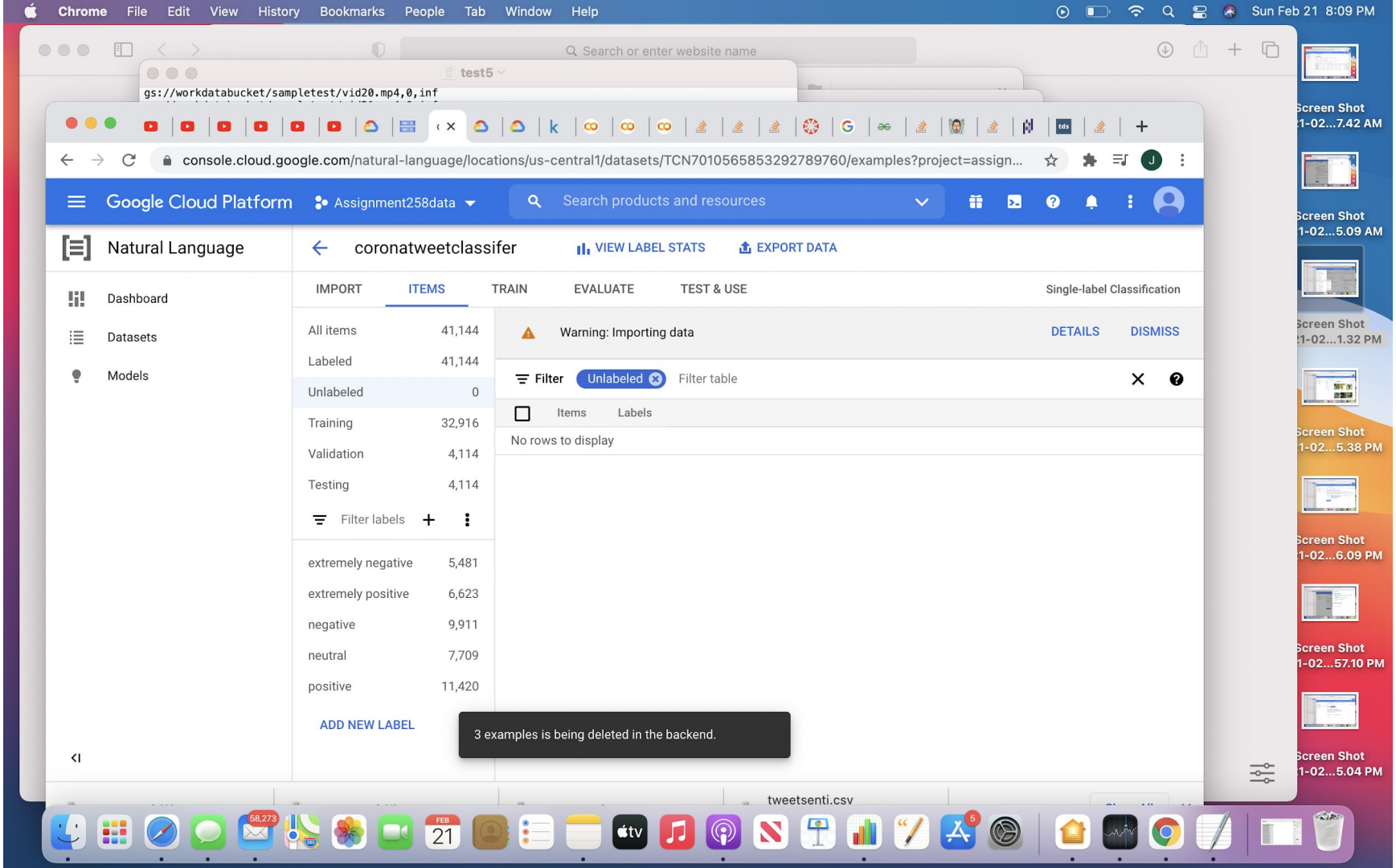
Model processing step

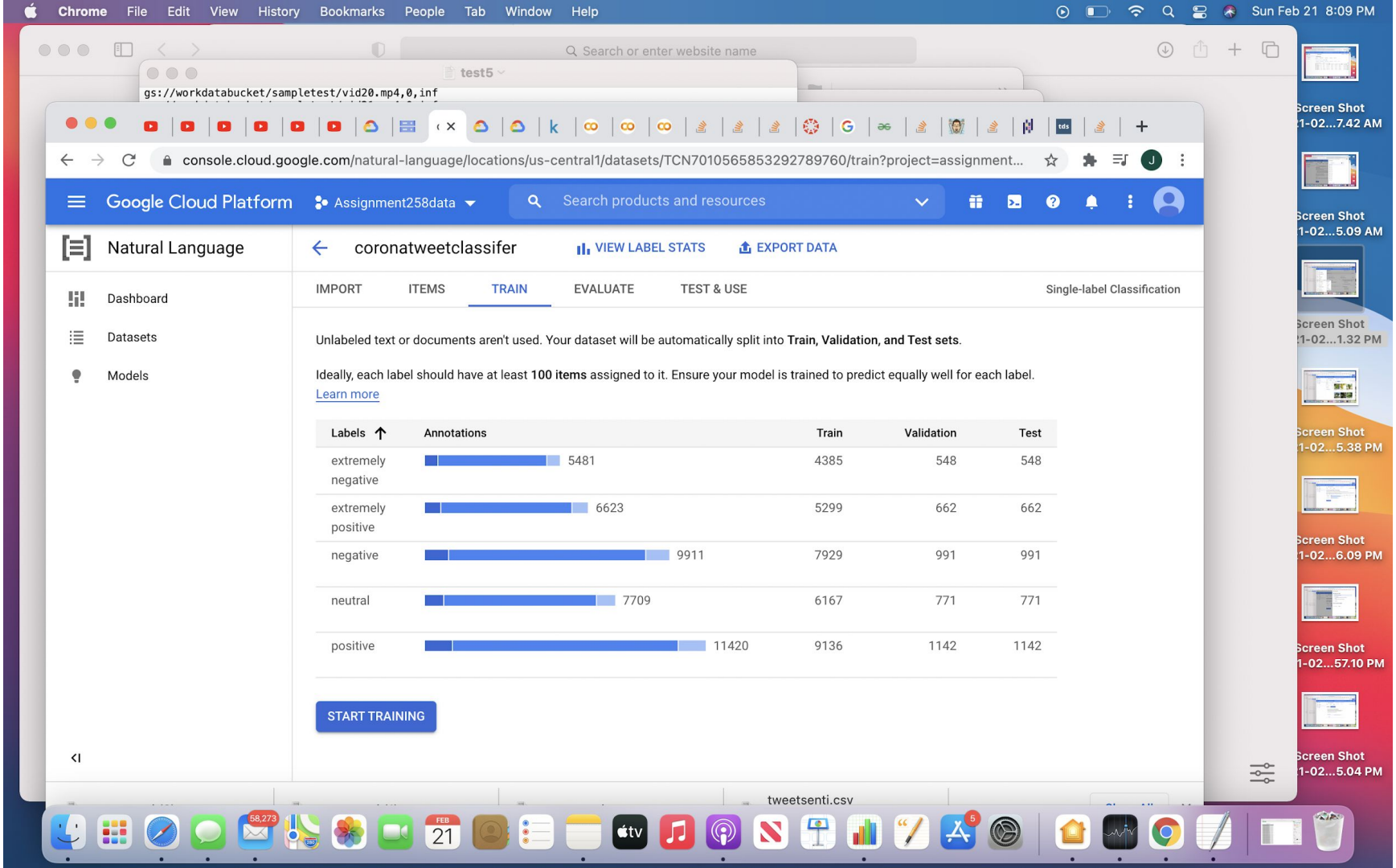


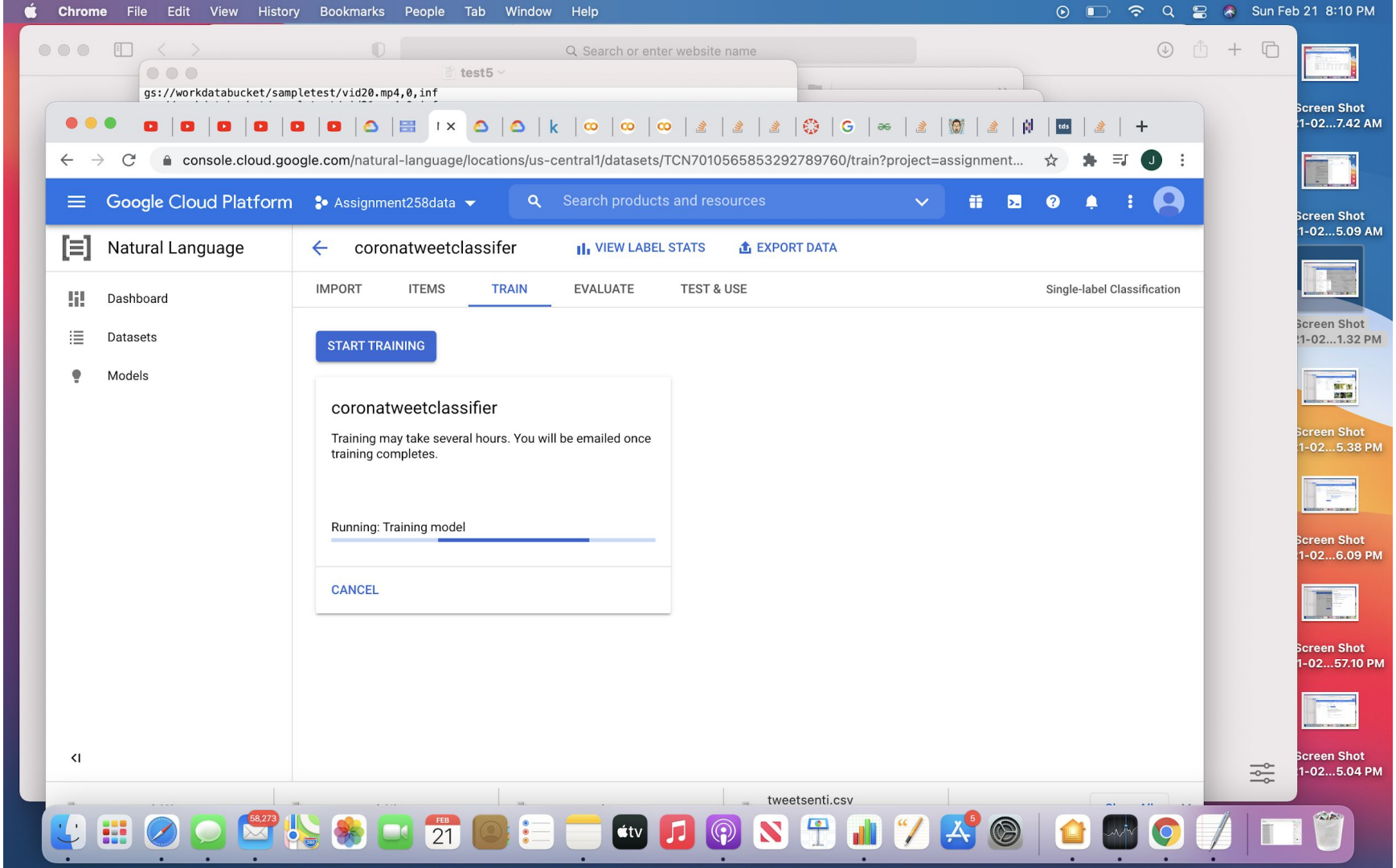
This step to show the uploaded data for training and the labels

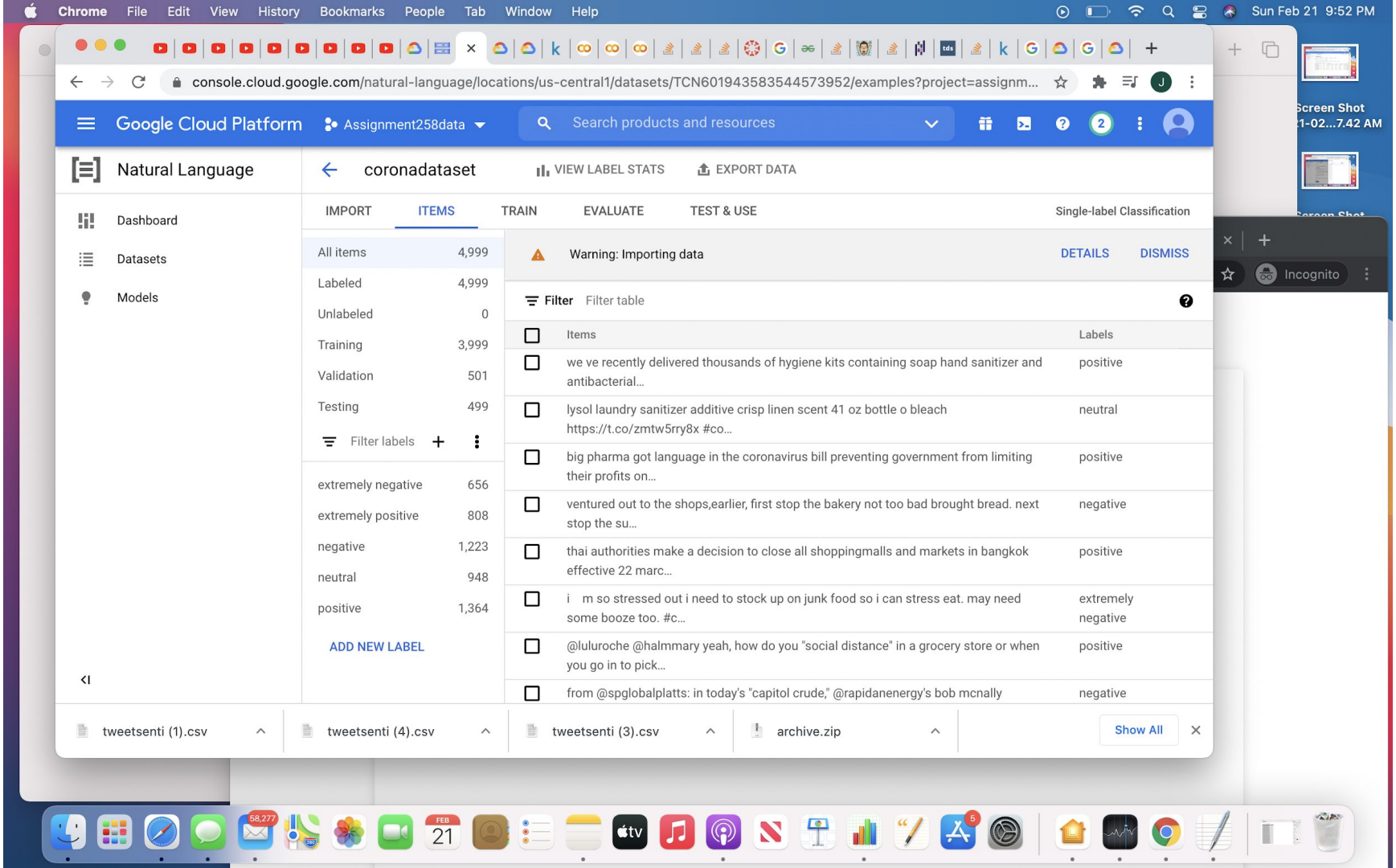



Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 8:09 PM
Search or enter website name
test5
gs://workdatabucket/sampletest/vid20.mp4,0,inf
console.cloud.google.com/natural-language/locations/us-central1/datasets/TCN7010565853292789760/examples?project=assign...
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
coronatweetclassifer
VIEW LABEL STATS
EXPORT DATA
Dashboard
Datasets
Models
IMPORT
ITEMS
TRAIN
EVALUATE
TEST & USE
Single-label Classification
All items 41,147
Labeled 41,144
Unlabeled 3
Training 32,916
Validation 4,114
Testing 4,114
Filter labels
extremely negative 5,481
extremely positive 6,623
negative 9,911
neutral 7,709
positive 11,420
ADD NEW LABEL
Warning: Importing data
DETAILS
DISMISS
3 selected
ASSIGN LABELS
DELETE
Filter
Unlabeled
Filter table
Items
Labels
neutral
@privycouncilca #socialdistancing isn t enough. i implore you to go visit any grocery store or pharm...
@tandhesi @foreignoffice @afzal4gorton @expressseries @sloughobserver @cmagovuk @sloughcouncil @slou...
tweetsenti.csv
Screen Shot 21-02...7.42 AM
Screen Shot 21-02...5.09 AM
Screen Shot 21-02...1.32 PM
Screen Shot 21-02...5.38 PM
Screen Shot 21-02...6.09 PM
Screen Shot 21-02...57.10 PM
Screen Shot 21-02...5.04 PM


Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 8:09 PM
Search or enter website name
test5
gs://workdatabucket/sampletest/vid20.mp4,0,inf
console.cloud.google.com/natural-language/locations/us-central1/datasets/TCN7010565853292789760/examples?project=assign...
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
coronatweetclassifer
VIEW LABEL STATS
EXPORT DATA
Dashboard
Datasets
Models
IMPORT
ITEMS
TRAIN
EVALUATE
TEST & USE
Single-label Classification
All items 41,144
Labeled 41,144
Unlabeled 0
Training 32,916
Validation 4,114
Testing 4,114
Filter labels
extremely negative 5,481
extremely positive 6,623
negative 9,911
neutral 7,709
positive 11,420
ADD NEW LABEL
Warning: Importing data
DETAILS
DISMISS
Filter
Unlabeled
Filter table
Items
Labels
No rows to display
3 examples is being deleted in the backend.
tweetsenti.csv
Screen Shot 21-02...7.42 AM
Screen Shot 21-02...5.09 AM
Screen Shot 21-02...1.32 PM
Screen Shot 21-02...5.38 PM
Screen Shot 21-02...6.09 PM
Screen Shot 21-02...57.10 PM
Screen Shot 21-02...5.04 PM


Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 8:09 PM
test5
gs://workdatabucket/sampletest/vid20.mp4,0,inf
console.cloud.google.com/natural-language/locations/us-central1/datasets/TCN7010565853292789760/train?project=assignment...
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
Dashboard
Datasets
Models
coronatweetclassifer
VIEW LABEL STATS
EXPORT DATA
IMPORT
ITEMS
TRAIN
EVALUATE
TEST & USE
Single-label Classification
Unlabeled text or documents aren't used. Your dataset will be automatically split into Train, Validation, and Test sets.
Ideally, each label should have at least 100 items assigned to it. Ensure your model is trained to predict equally well for each label.
Learn more
Labels
Annotations
Train
Validation
Test
extremely negative 5481 4385 548 548
extremely positive 6623 5299 662 662
negative 9911 7929 991 991
neutral 7709 6167 771 771
positive 11420 9136 1142 1142
START TRAINING
tweetsenti.csv


Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 8:10 PM
Search or enter website name
test5
gs://workdatabucket/sampletest/vid20.mp4,0,inf
console.cloud.google.com/natural-language/locations/us-central1/datasets/TCN7010565853292789760/train?project=assignment...
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
Dashboard
Datasets
Models
coronatweetclassifer
VIEW LABEL STATS
EXPORT DATA
IMPORT
ITEMS
TRAIN
EVALUATE
TEST & USE
Single-label Classification
START TRAINING
coronatweetclassifier
Training may take several hours. You will be emailed once training completes.
Running: Training model
CANCEL
tweetsenti.csv
Screen Shot 21-02...7.42 AM
Screen Shot 21-02...5.09 AM
Screen Shot 21-02...1.32 PM
Screen Shot 21-02...5.38 PM
Screen Shot 21-02...6.09 PM
Screen Shot 21-02...57.10 PM
Screen Shot 21-02...5.04 PM


Chrome File Edit View History Bookmarks People Tab Window Help
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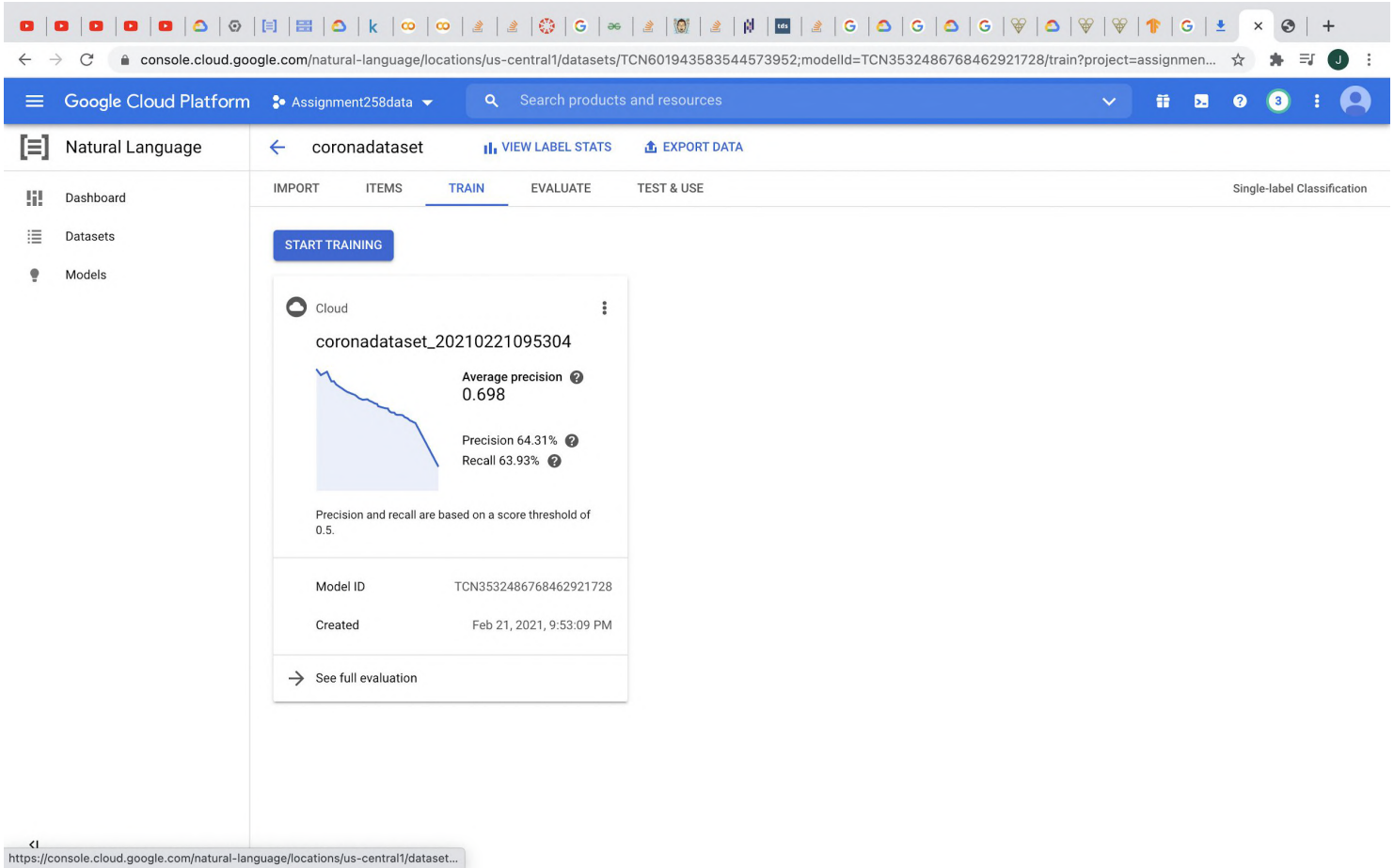
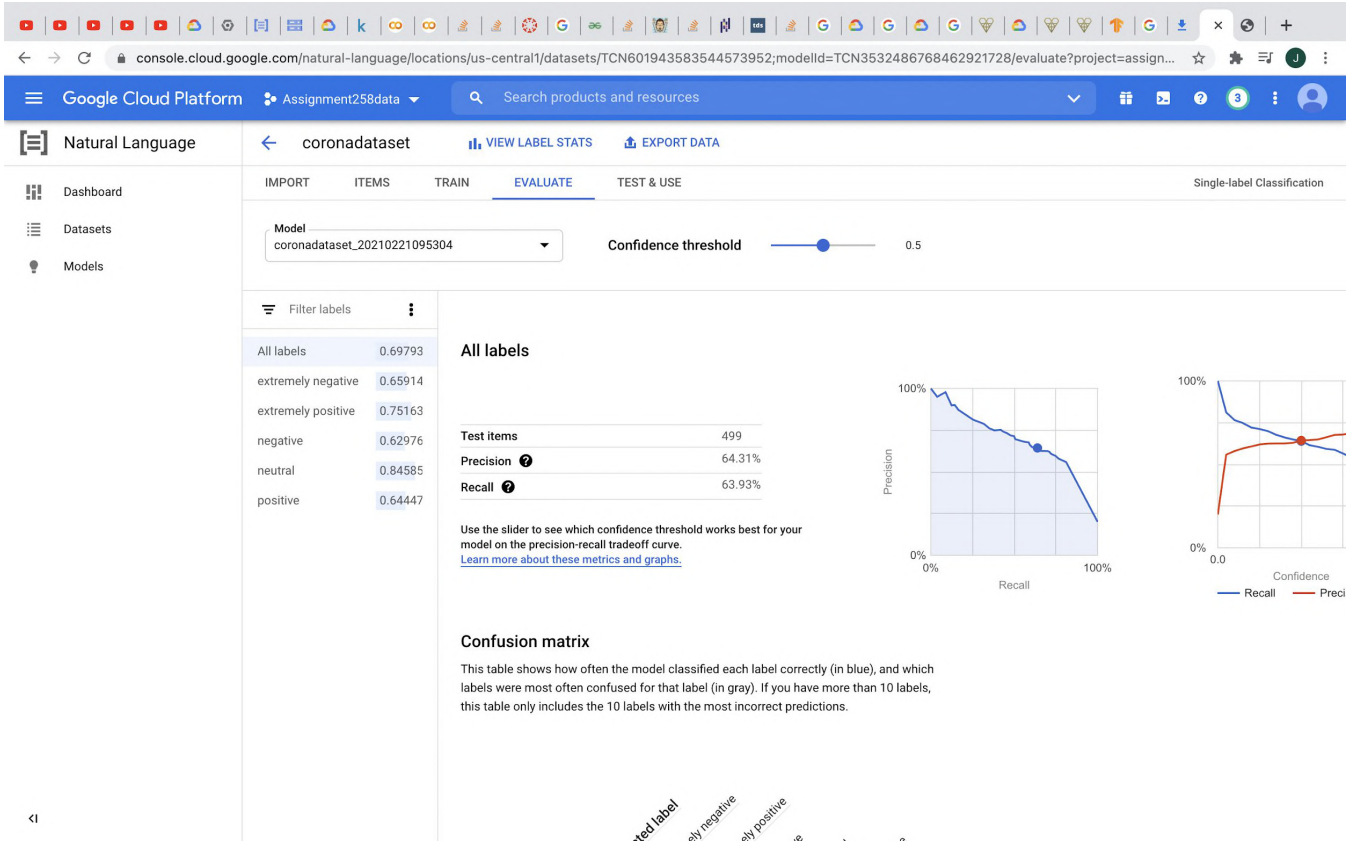
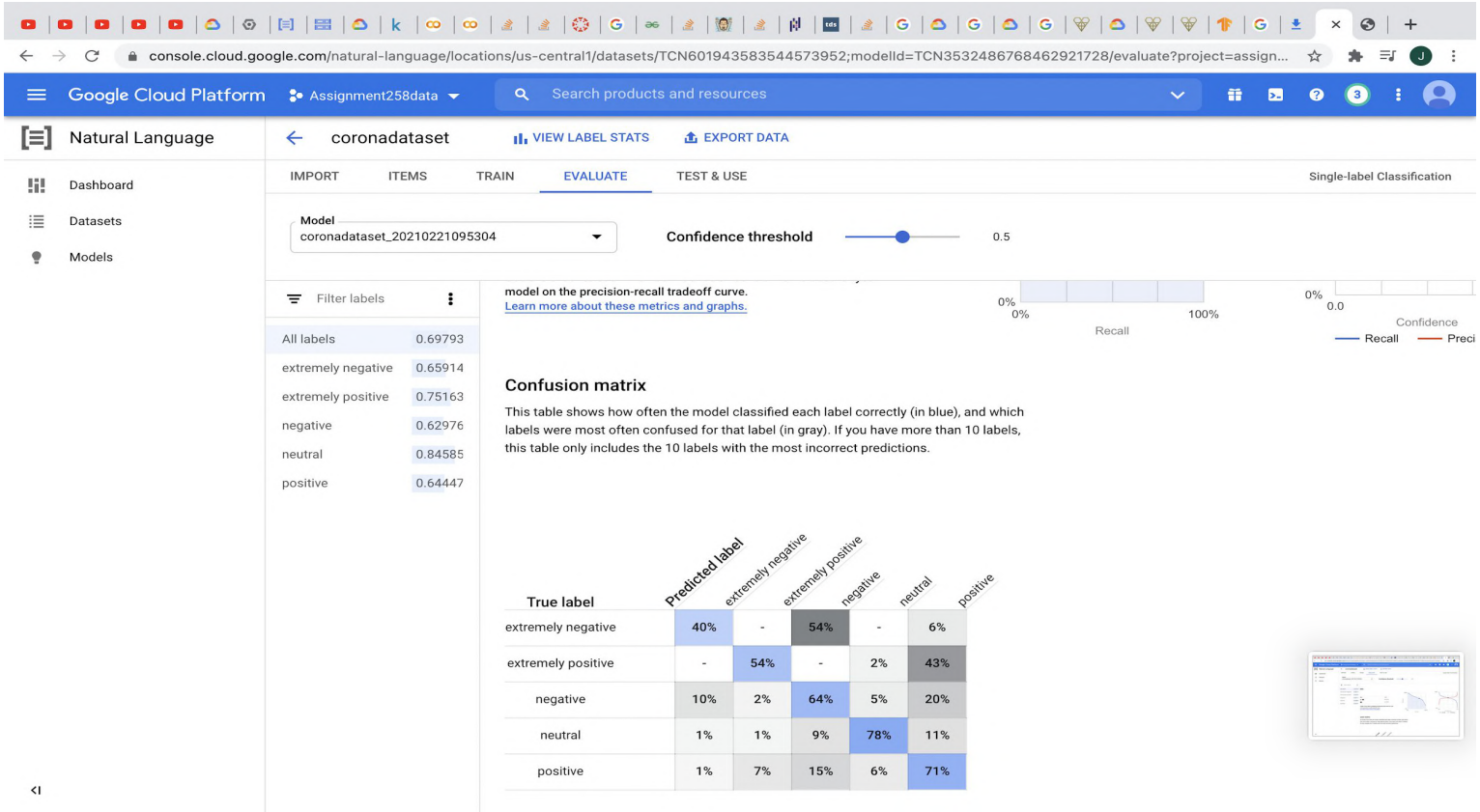
console.cloud.google.com/natural-language/locations/us-central1/datasets/TCN601943583544573952/examples?project=assignm...
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
coronadataset
VIEW LABEL STATS
EXPORT DATA
Dashboard
Datasets
Models
IMPORT
ITEMS
TRAIN
EVALUATE
TEST & USE
Single-label Classification
All items 4,999
Labeled 4,999
Unlabeled 0
Training 3,999
Validation 501
Testing 499
Filter labels
extremely negative 656
extremely positive 808
negative 1,223
neutral 948
positive 1,364
ADD NEW LABEL
Warning: Importing data
DETAILS
DISMISS
Filter
Filter table
Items
Labels
we ve recently delivered thousands of hygiene kits containing soap hand sanitizer and antibacterial...
positive
lysol laundry sanitizer additive crisp linen scent 41 oz bottle o bleach https://t.co/zmtw5rry8x #co...
neutral
big pharma got language in the coronavirus bill preventing government from limiting their profits on...
positive
ventured out to the shops,earlier, first stop the bakery not too bad brought bread. next stop the su...
negative
thai authorities make a decision to close all shoppingmalls and markets in bangkok effective 22 marc...
positive
i m so stressed out i need to stock up on junk food so i can stress eat. may need some booze too. #c...
extremely negative
@luluroche @halmmary yeah, how do you "social distance" in a grocery store or when you go in to pick...
positive
from @spglobalplatts: in today's "capitol crude," @rapidanenergy's bob mcnally
negative
tweetsenti (1).csv
tweetsenti (4).csv
tweetsenti (3).csv
archive.zip
Show All
Incognito


console.cloud.google.com/natural-language/locations/us-central1/datasets/TCN601943583544573952;modelId=TCN3532486768462921728/train?project=assignmen...
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
Dashboard
Datasets
Models
coronadataset
VIEW LABEL STATS
EXPORT DATA
IMPORT
ITEMS
TRAIN
EVALUATE
TEST & USE
Single-label Classification
START TRAINING
Cloud
coronadataset_20210221095304
Average precision
0.698
Precision 64.31%
Recall 63.93%
Precision and recall are based on a score threshold of 0.5.
Model ID
TCN3532486768462921728
Created
Feb 21, 2021, 9:53:09 PM
See full evaluation
https://console.cloud.google.com/natural-language/locations/us-central1/dataset...

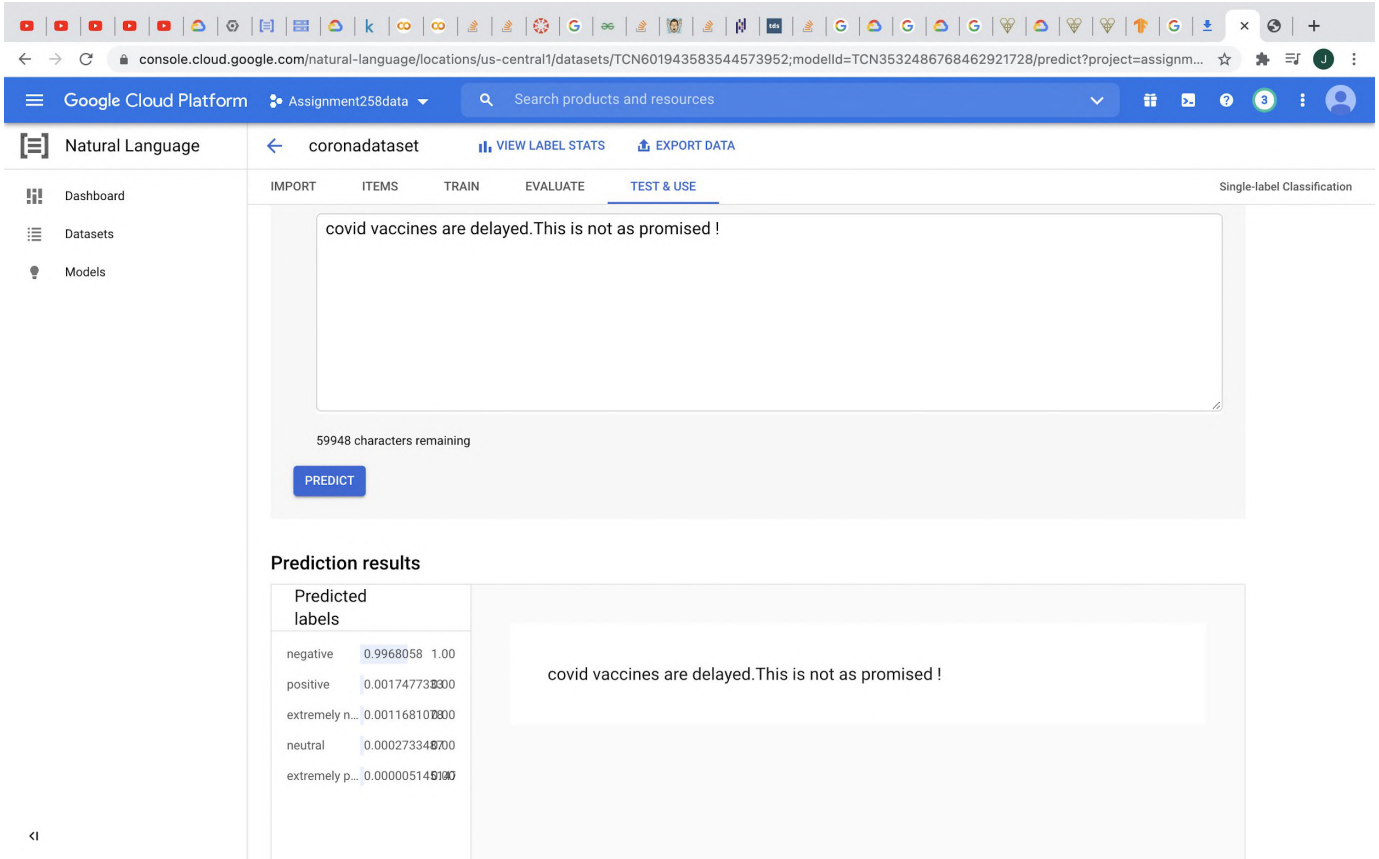
Model training evaluation



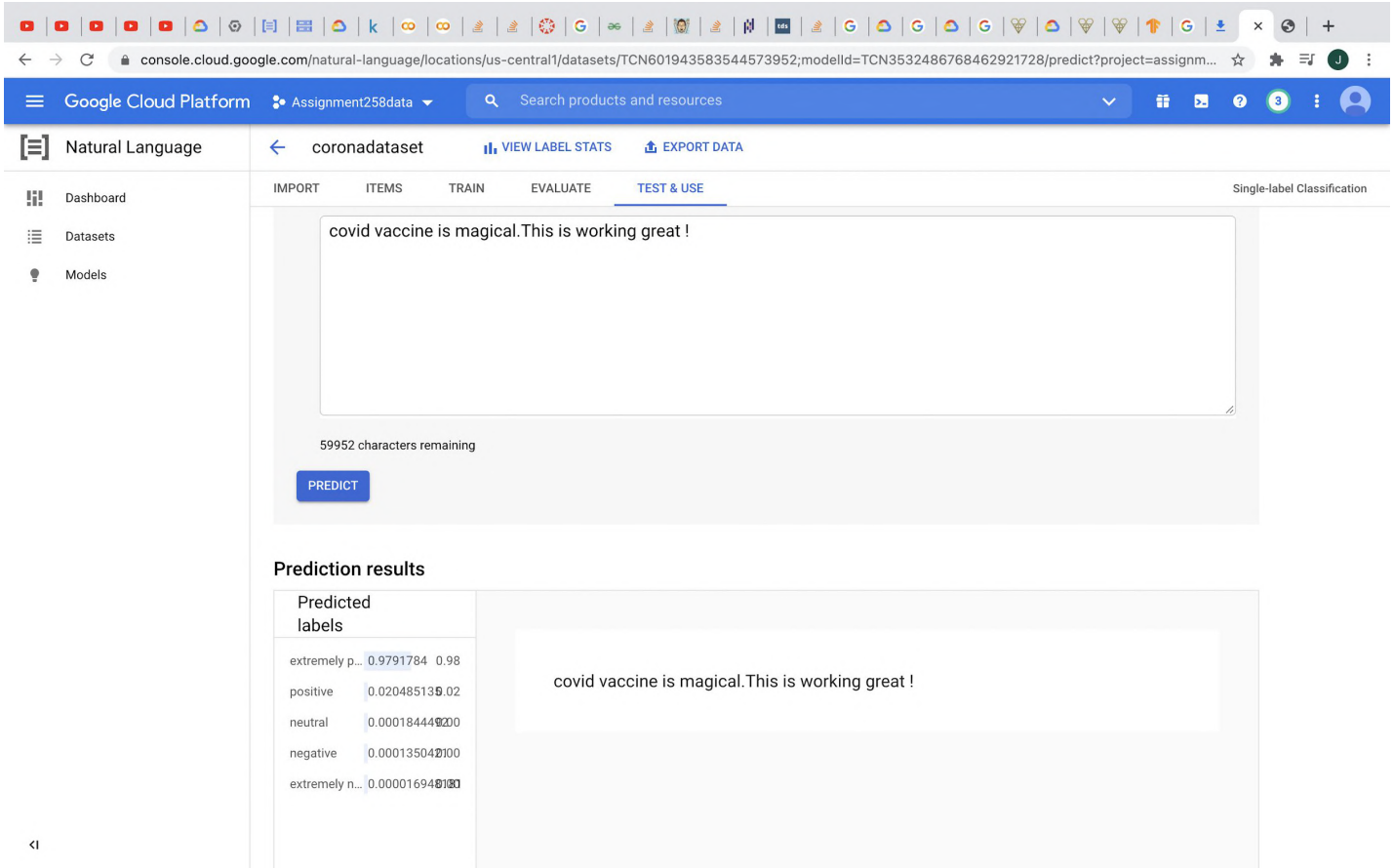
Confusion matrix

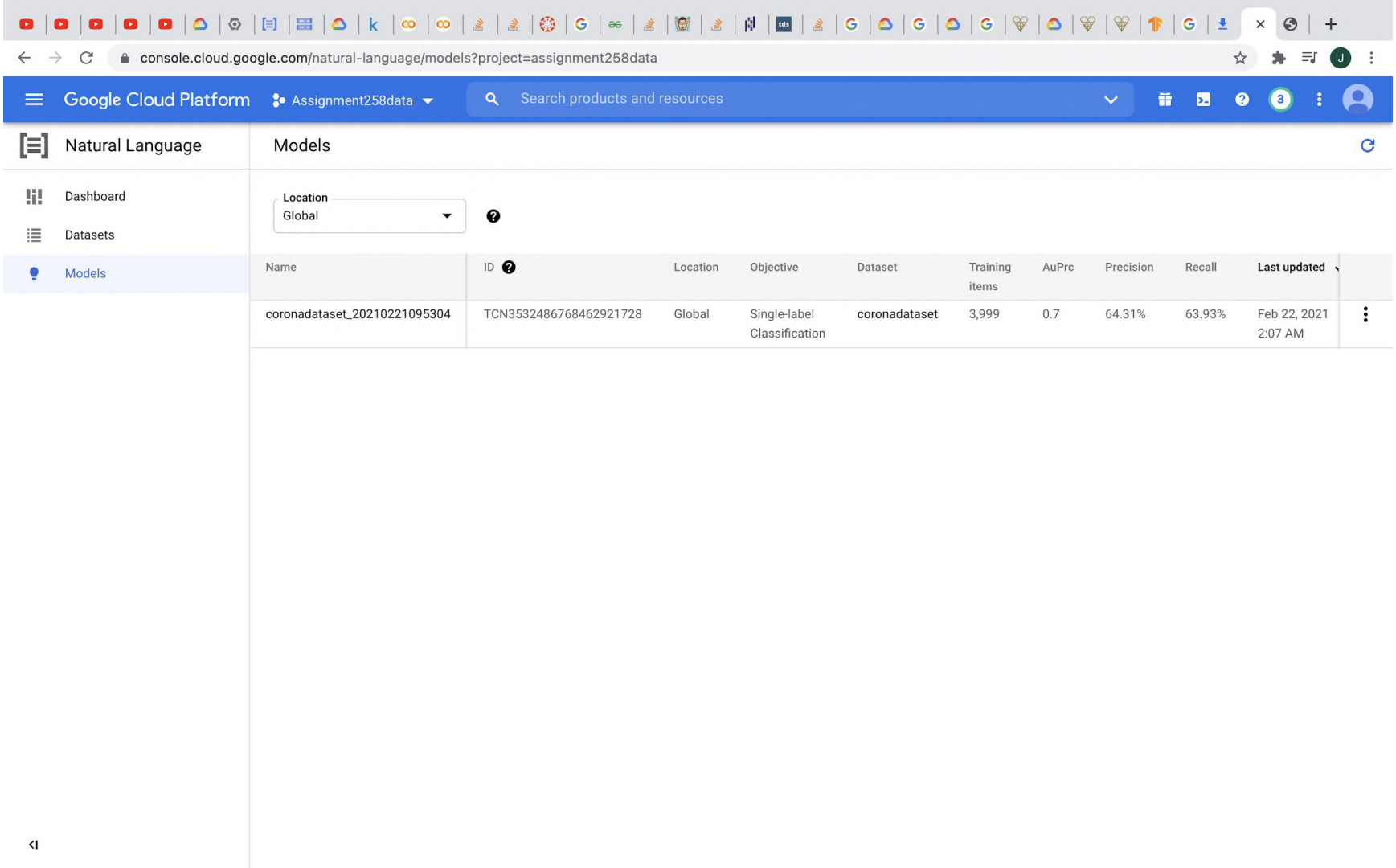


Input data given and the prediction model results



One more example

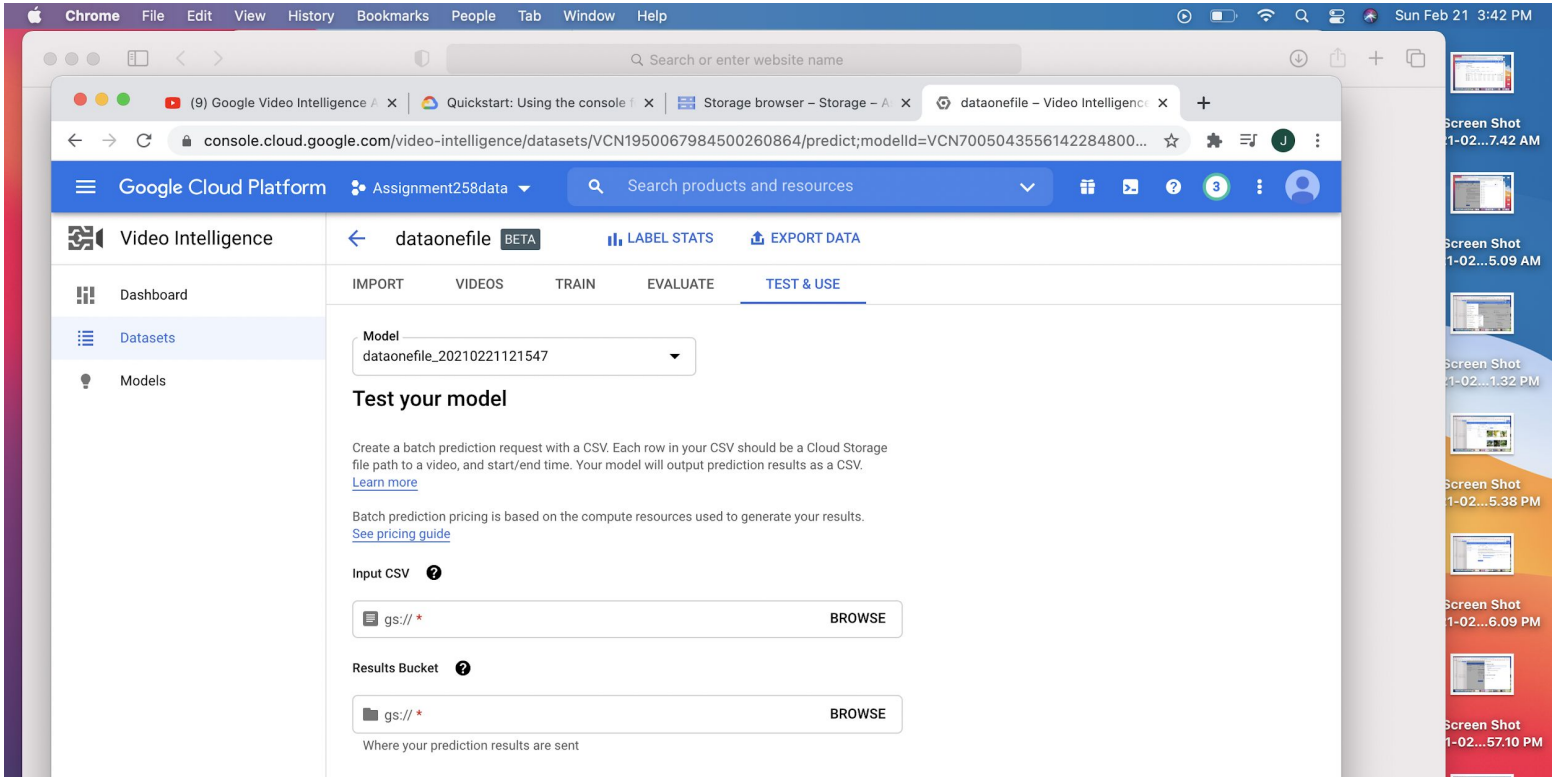



console.cloud.google.com/natural-language/models?project=assignment258data
Google Cloud Platform
Assignment258data
Search products and resources
Natural Language
Dashboard
Datasets
Models
Models
Location
Global
Name
ID
Location
Objective
Dataset
Training items
AuPrc
Precision
Recall
Last updated
coronadataset_20210221095304
TCN3532486768462921728
Global
Single-label Classification
coronadataset
3,999
0.7
64.31%
63.93%
Feb 22, 2021 2:07 AM

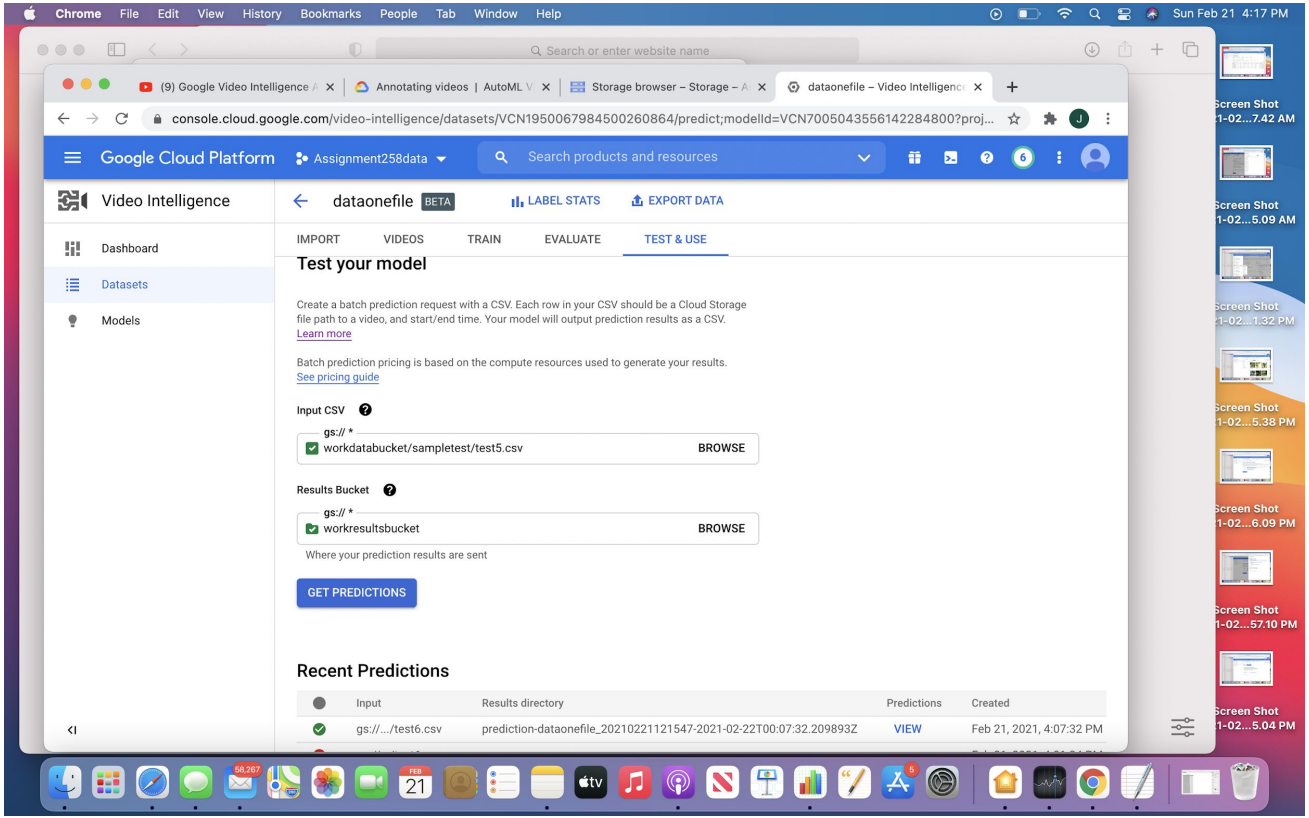
Part 1 c) Video Classification

This video classification used pexel.com to capture freely available video clips of people working in office environment and at home. Based on the surrounding , posture this model predicts if the input video the person is working from home or from office

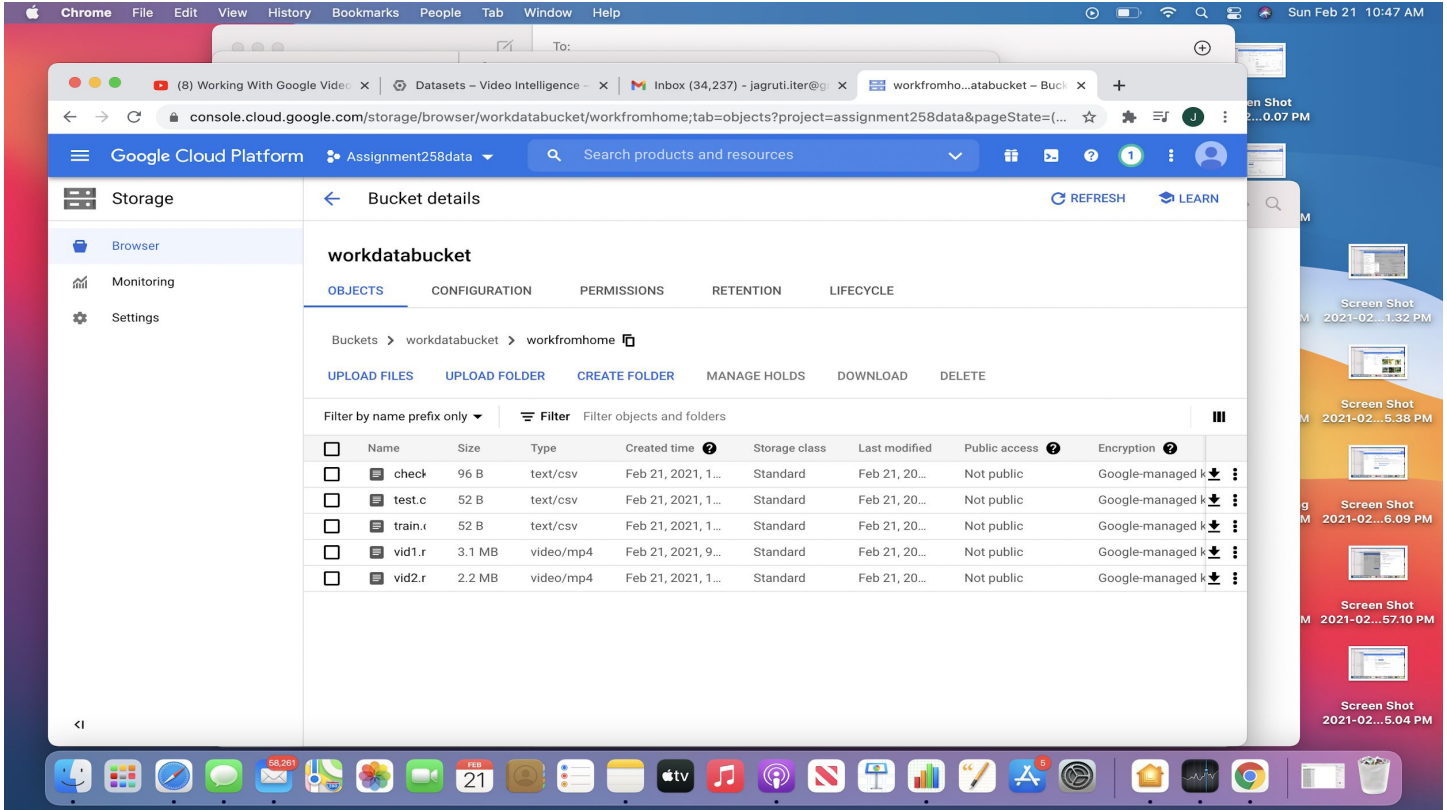
Input for listing the training files and test files for the model to train



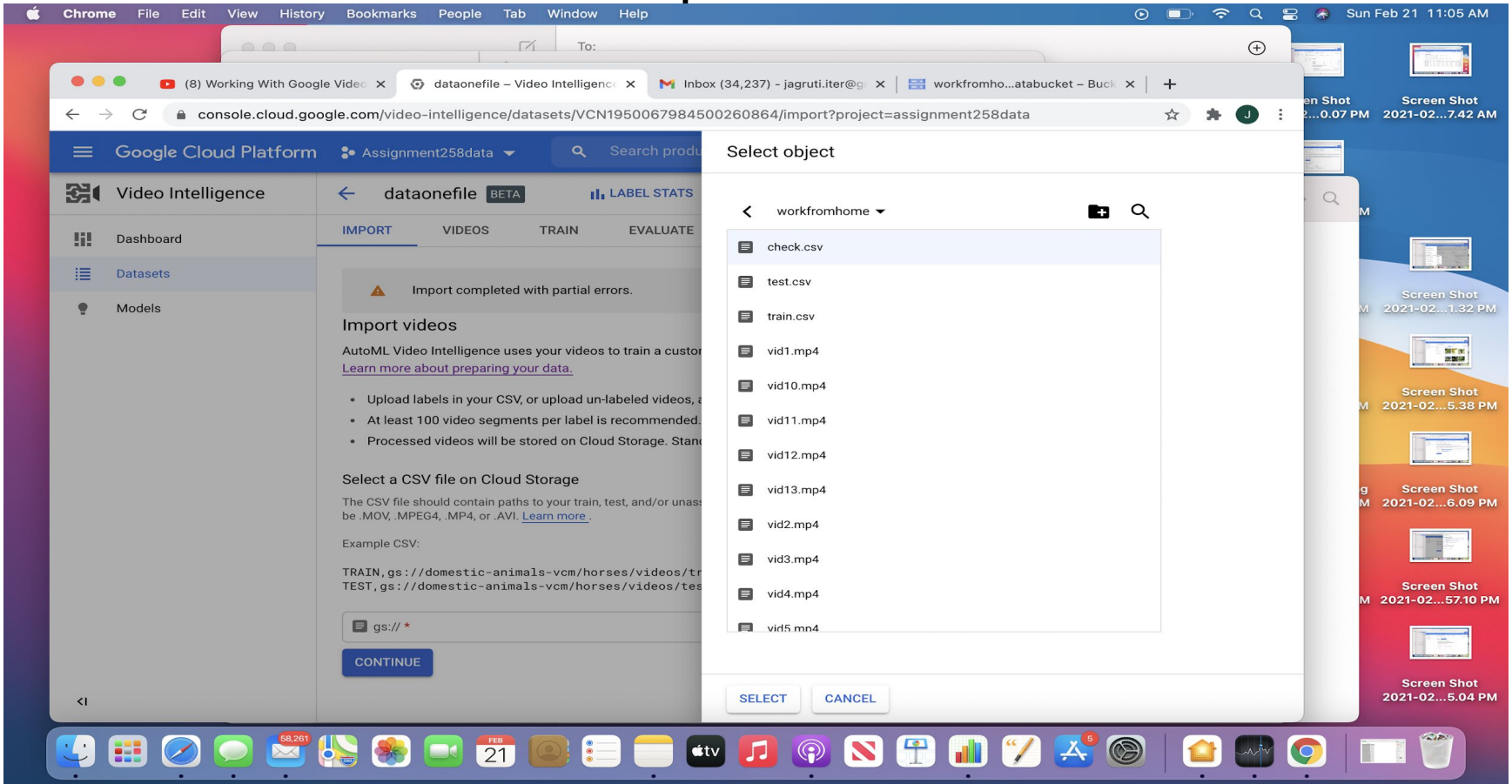
Input had the train or test type , the file path in storage bucket and the label for training



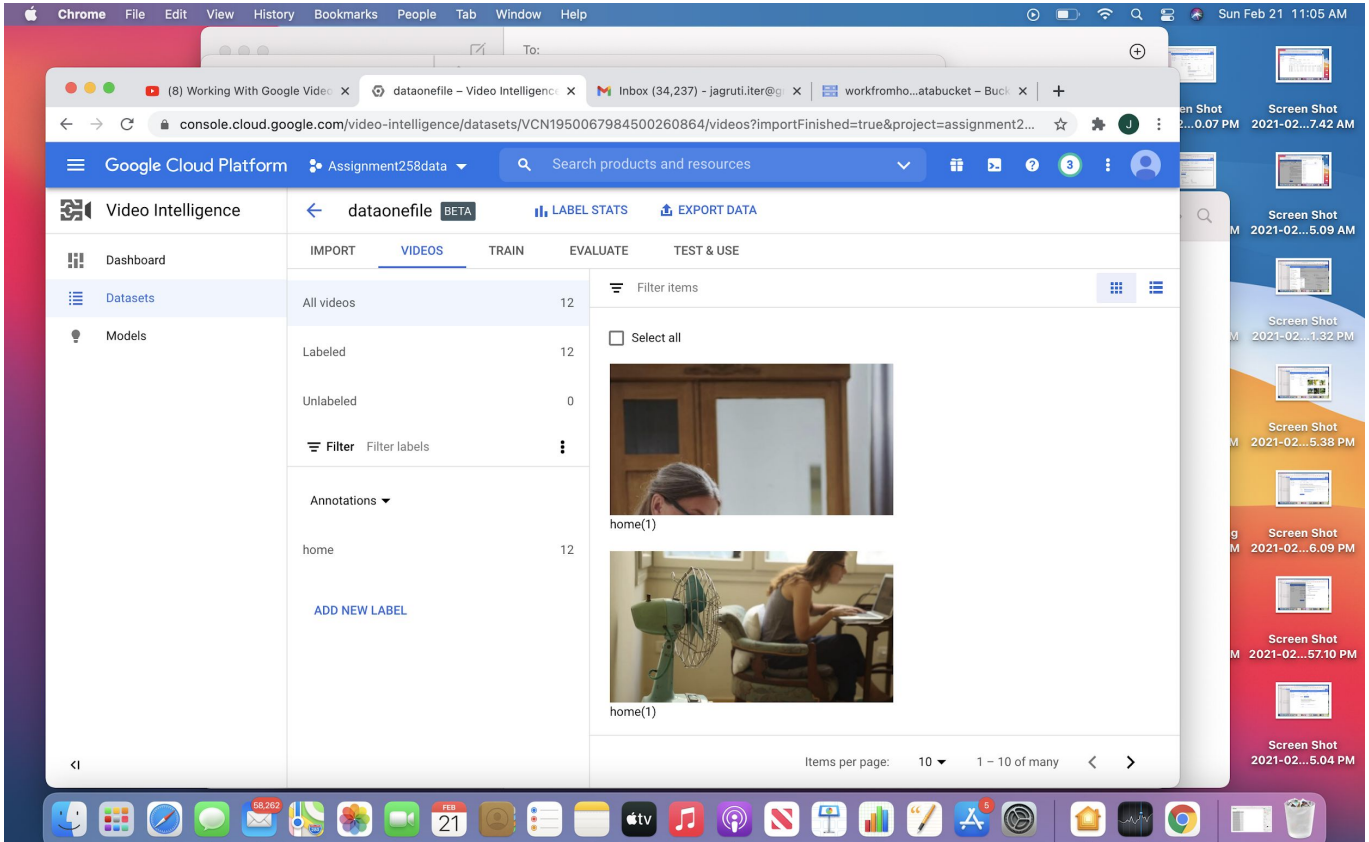
Storage bucket

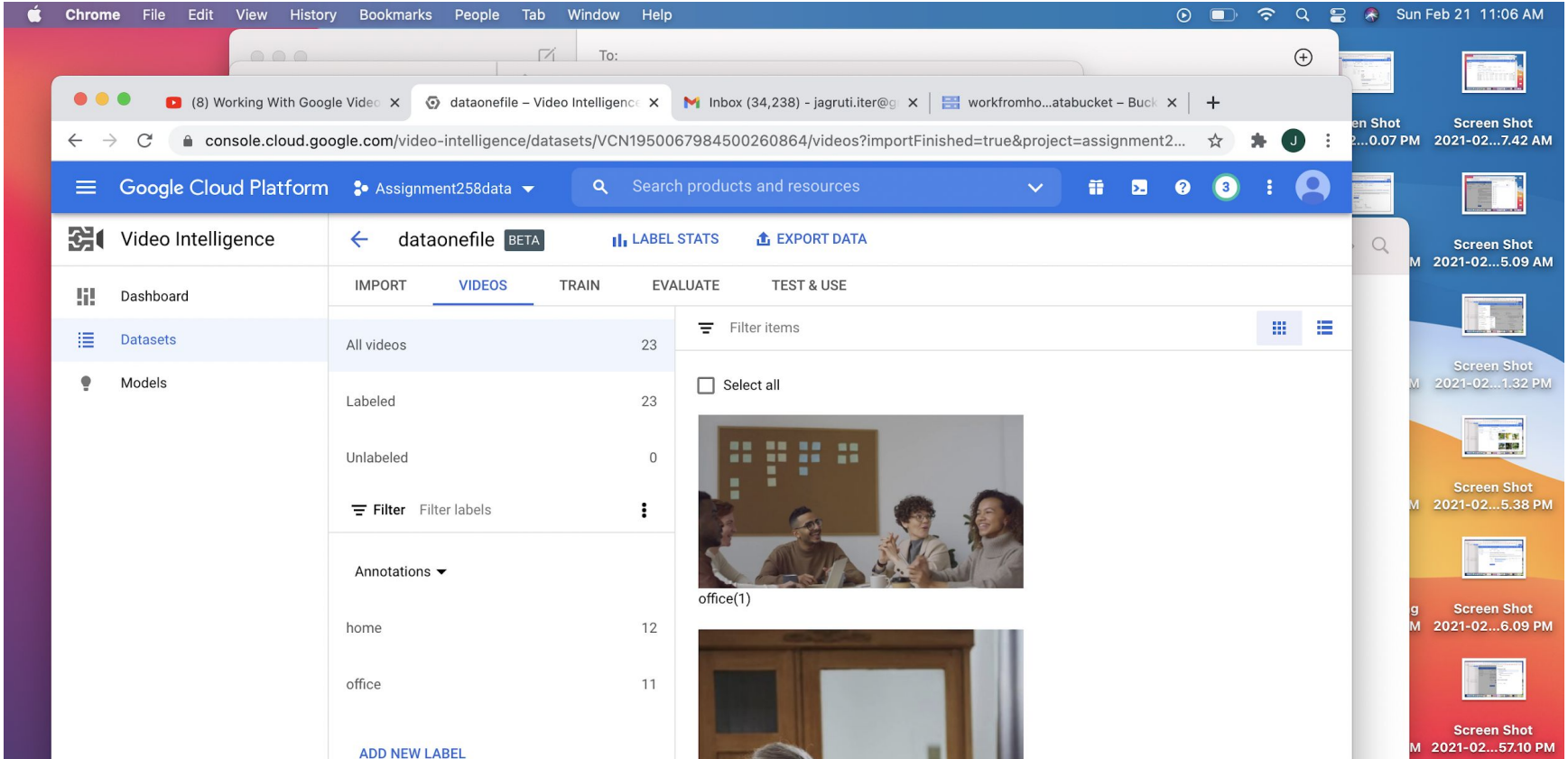


These are the video files uploaded

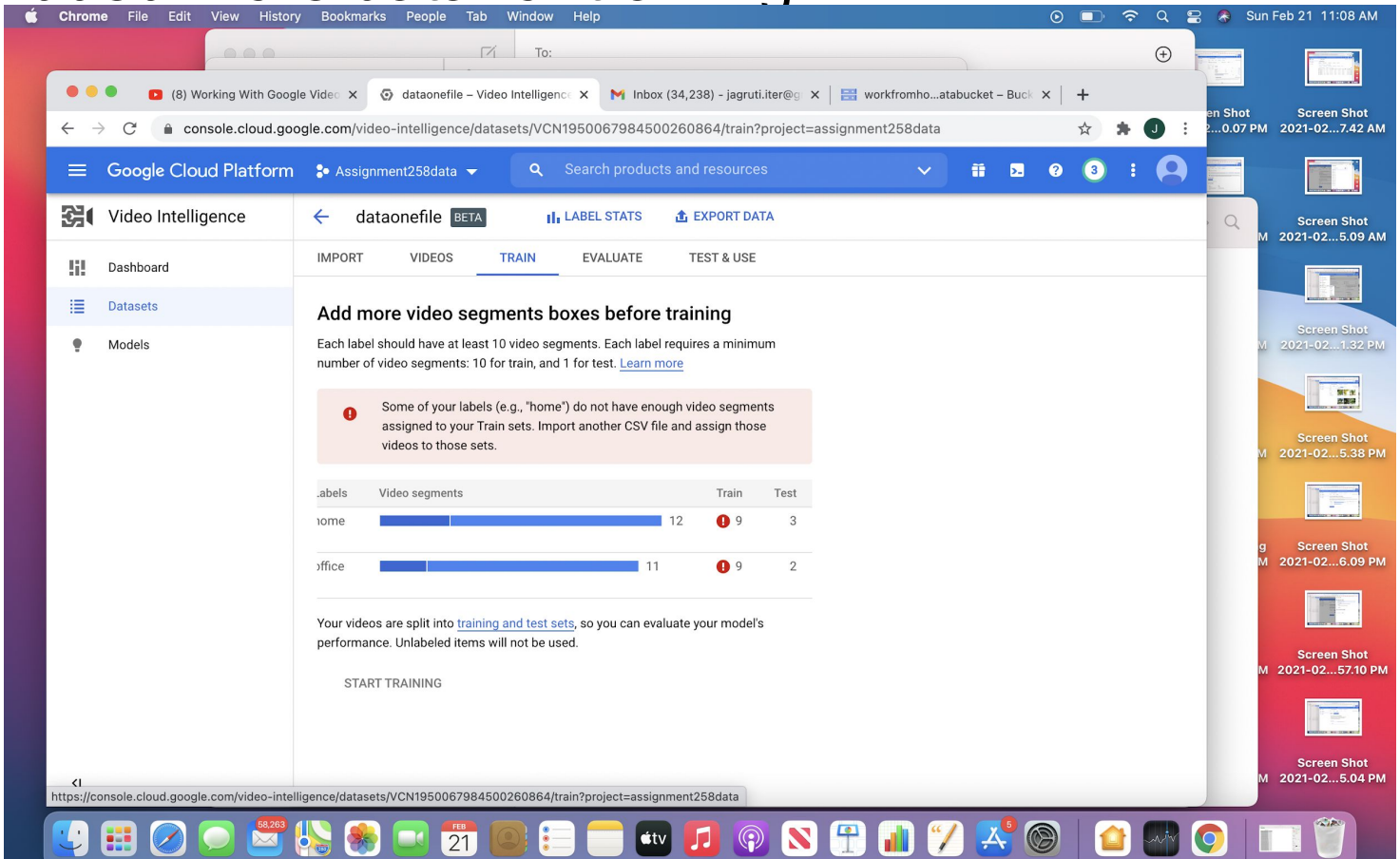


Data uploaded -




Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 11:06 AM
(8) Working With Google Vide
dataonefile – Video Intelligenc
Inbox (34,238) - jagruti.iter@g
workfromho...atabucket – Buck
console.cloud.google.com/video-intelligence/datasets/VCN1950067984500260864/videos?importFinished=true&project=assignment2...
Google Cloud Platform
Assignment258data
Search products and resources
Video Intelligence
dataonefile BETA
LABEL STATS
EXPORT DATA
Dashboard
Datasets
Models
IMPORT
VIDEOS
TRAIN
EVALUATE
TEST & USE
All videos 23
Labeled 23
Unlabeled 0
Filter Filter labels
Annotations
home 12
office 11
ADD NEW LABEL
Filter items
Select all
office(1)
Screen Shot 2021-02...7.42 AM
Screen Shot 2021-02...5.09 AM
Screen Shot 2021-02...1.32 PM
Screen Shot 2021-02...5.38 PM
Screen Shot 2021-02...6.09 PM
Screen Shot 2021-02...57.10 PM

Added more data for training



(8) Working With Google Vide | Datasets – Video Intelligence – | Inbox (34,239) - jagruti.iter@g | Overview – Billing – Assignmer | 10,000+ Best Work At Home Vi

console.cloud.google.com/video-intelligence/datasets/VCN1950067984500260864/evaluate;modelId=VCN7005043556142284800?project=assignment258data

Google Cloud Platform | Assignment258data | Search products and resources

Video Intelligence

- Dashboard
- Datasets
- Models

dataonefile BETA | LABEL STATS | EXPORT DATA

IMPORT | VIDEOS | TRAIN | EVALUATE | TEST & USE

Model
dataonefile_20210221121547

Model created	Analyzed	Avg precision	Precision	Recall
Feb 21, 2021 12:15 PM	7 videos 7 annotations	0.898	75.0%	85.7%

Filter Filter labels

- All labels
- office
- home

All labels

Score threshold

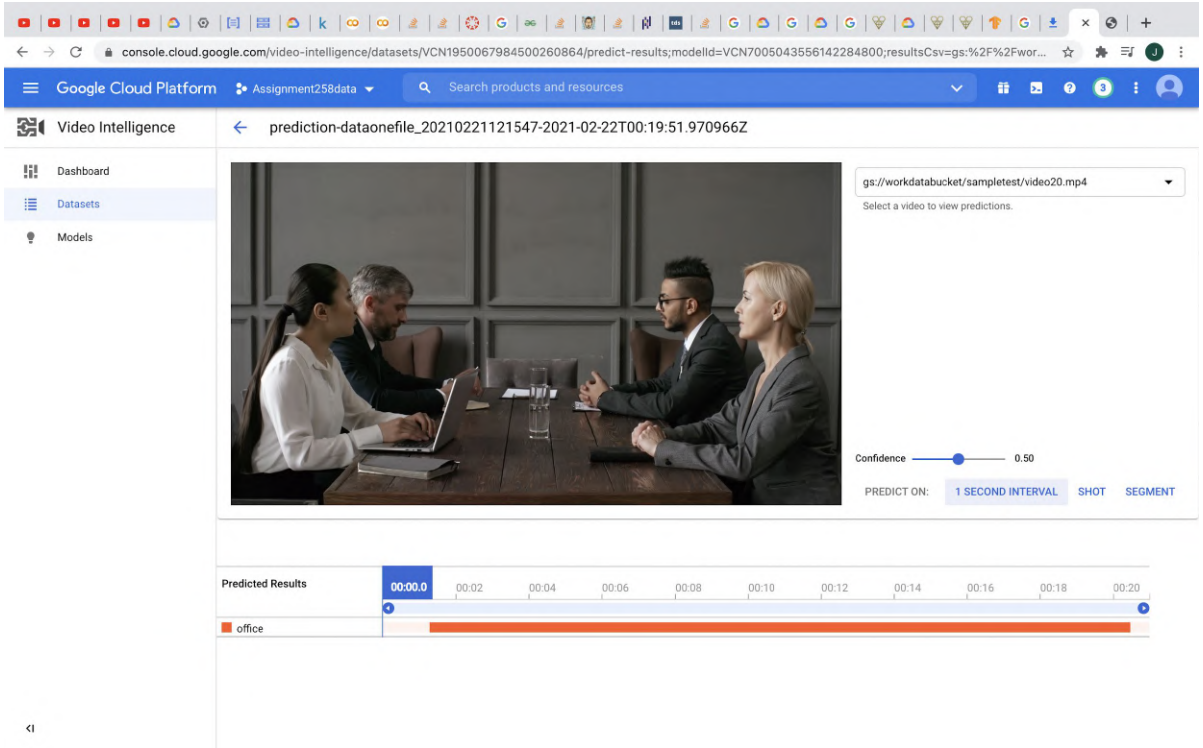
Displaying nearest threshold: 0.49

Total Videos	33
Total Annotations	33
Train Videos	26
Train Annotations	26
Precision	75.0%
Recall	85.7%

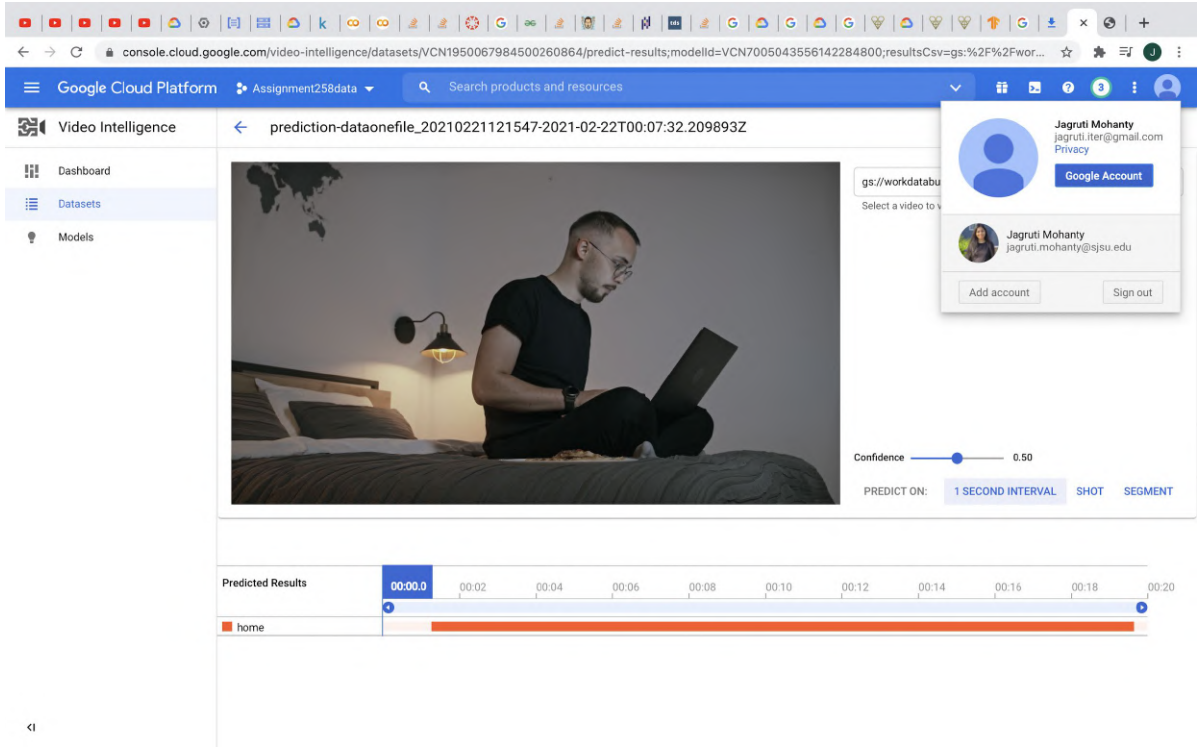
All test videos are evaluated at the time of training. If you modify this dataset after training, those modifications will not be reflected here.
Learn more about these metrics and graphs

pexels-tima-mir....mp4 | pexels-pavel-d....mp4 | pexels-pavel-d....mp4 | pexels-pavel-d....mp4 | video (1).mp4 | Show All

This is to show the prediction results the model accurately predicts office environment



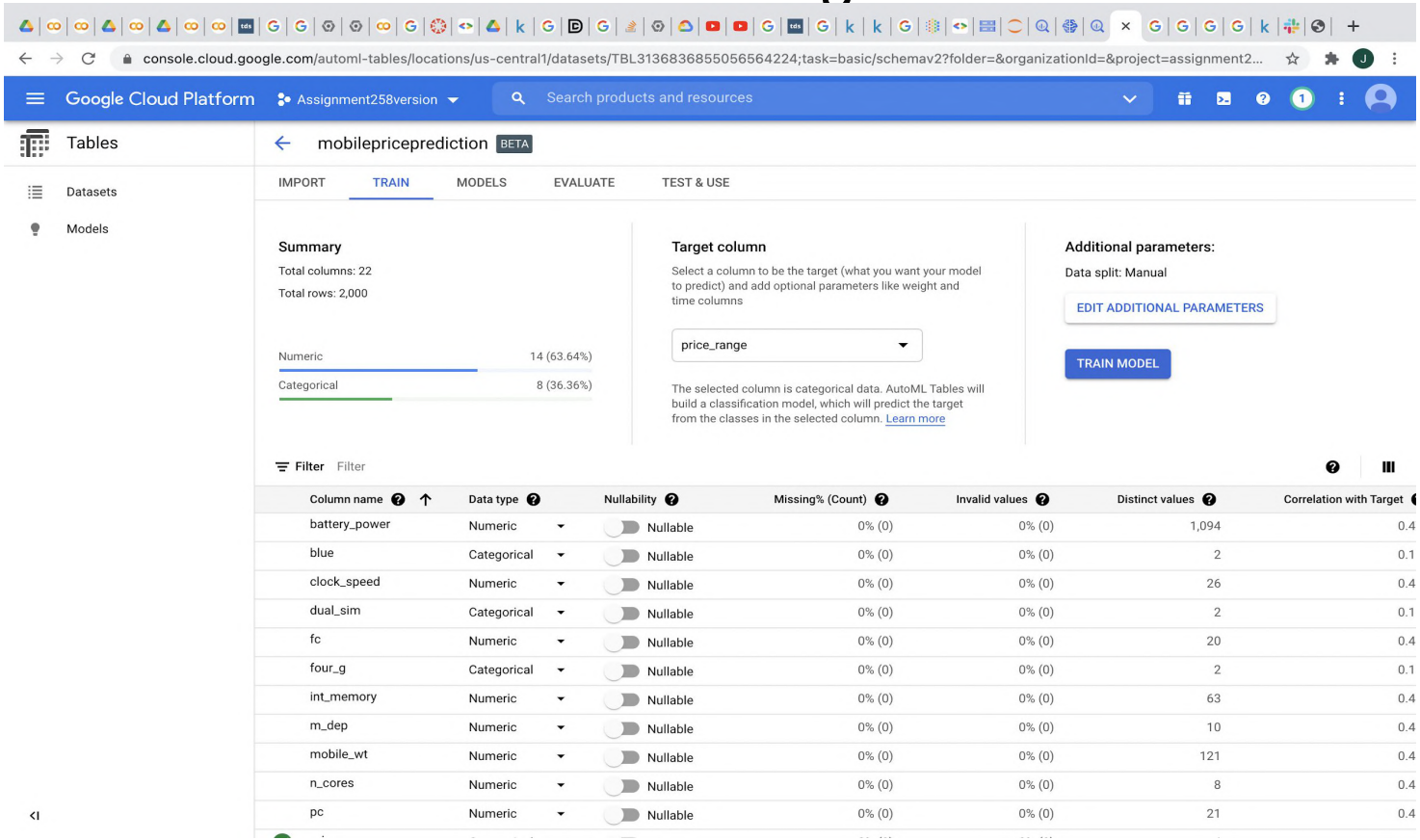
Model is able to accurately predict based on surrounding that person is working from home. My name is shown confirm assignment was done by my account



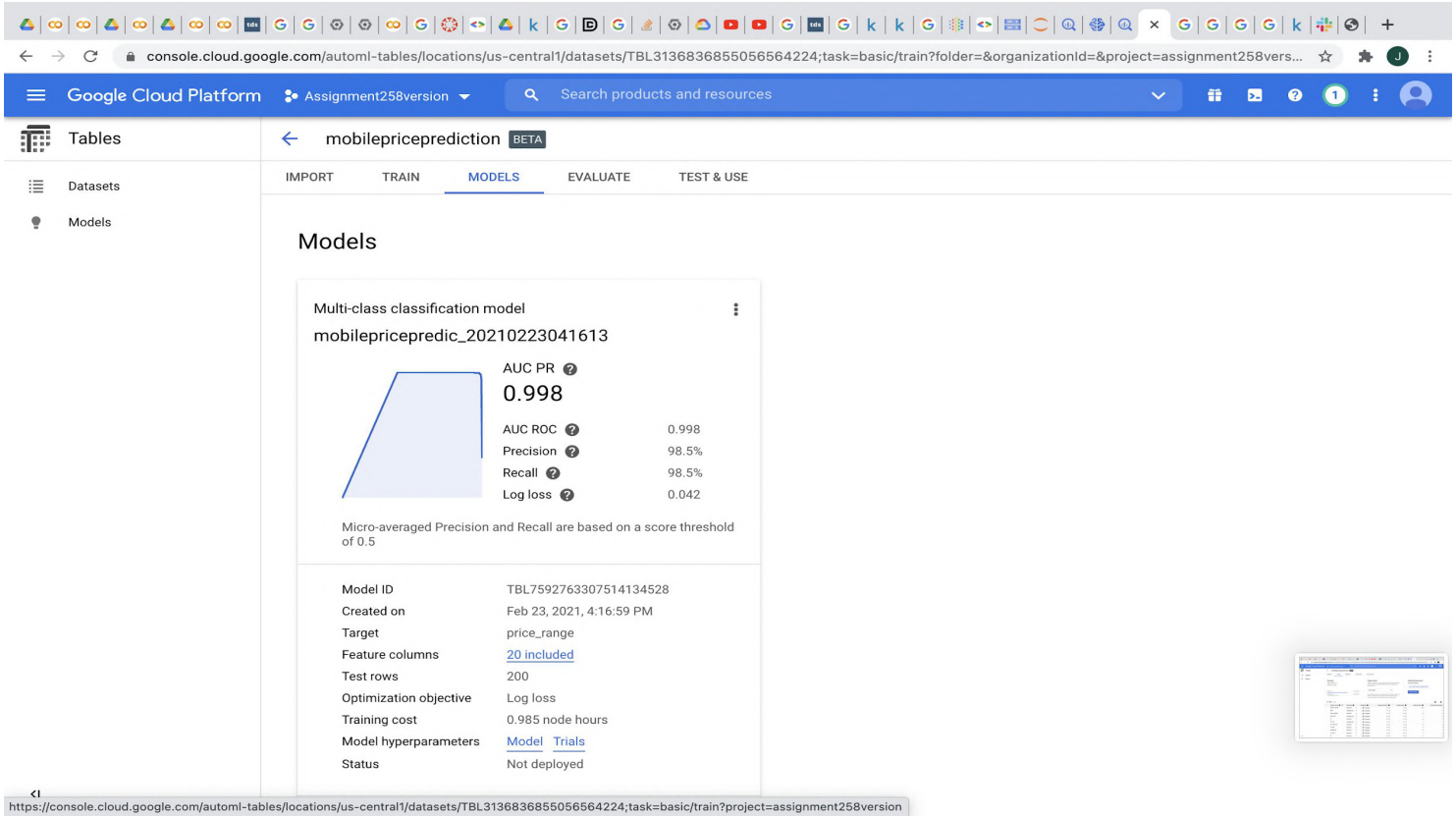
Part 1 d) Structured Data ran a regression model for predicting mobile phone price

Dataset was from kaggle , applied preprocessing and uploaded it into bucket for running regression task to provide input details for a mobile and based on configurations and other details predict what should be the price.

Data and features in the training set



This is to show the prediction accuracy of the model :



console.cloud.google.com/automl-tables/locations/us-central1/datasets/TBL3136836855056564224;modelId=TBL7592763307514134528;task=basic/predict?project=assi...

Google Cloud Platform | Assignment258version | Search products and resources

Tables

- Datasets
- Models

mobilepricepredictionBETA

IMPORT | TRAIN | MODELS | EVALUATE | TEST & USE

CSVs from Cloud Storage

Bucket must be in the us-central1 region

CSV formatting

gs:// * mobilepricebucket/sample.csv BROWSE

Result

BigQuery project

BigQuery Project Id

Cloud Storage bucket

Bucket must be in the us-central1 region

gs:// * mobilepricebucket BROWSE

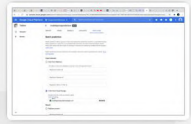
Generate feature importance

SEND BATCH PREDICTION

Recent Predictions

Input	Results directory	Created	Processed in	Status

No rows to display



console.cloud.google.com/automl-tables/locations/us-central1/datasets/TBL3136836855056564224;modelId=TBL7592763307514134528;task=basic/predict?project=assi...

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Tables

- Datasets
- Models

mobilepricepredictionBETA

IMPORT | TRAIN | MODELS | EVALUATE | TEST & USE

CSVs from Cloud Storage

Bucket must be in the us-central1 region

CSV formatting

gs:// * mobilepricebucket/sample.csv BROWSE

Result

BigQuery project

BigQuery Project Id

Cloud Storage bucket

Bucket must be in the us-central1 region

gs:// * mobilepricebucket BROWSE

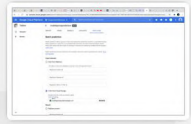
Generate feature importance

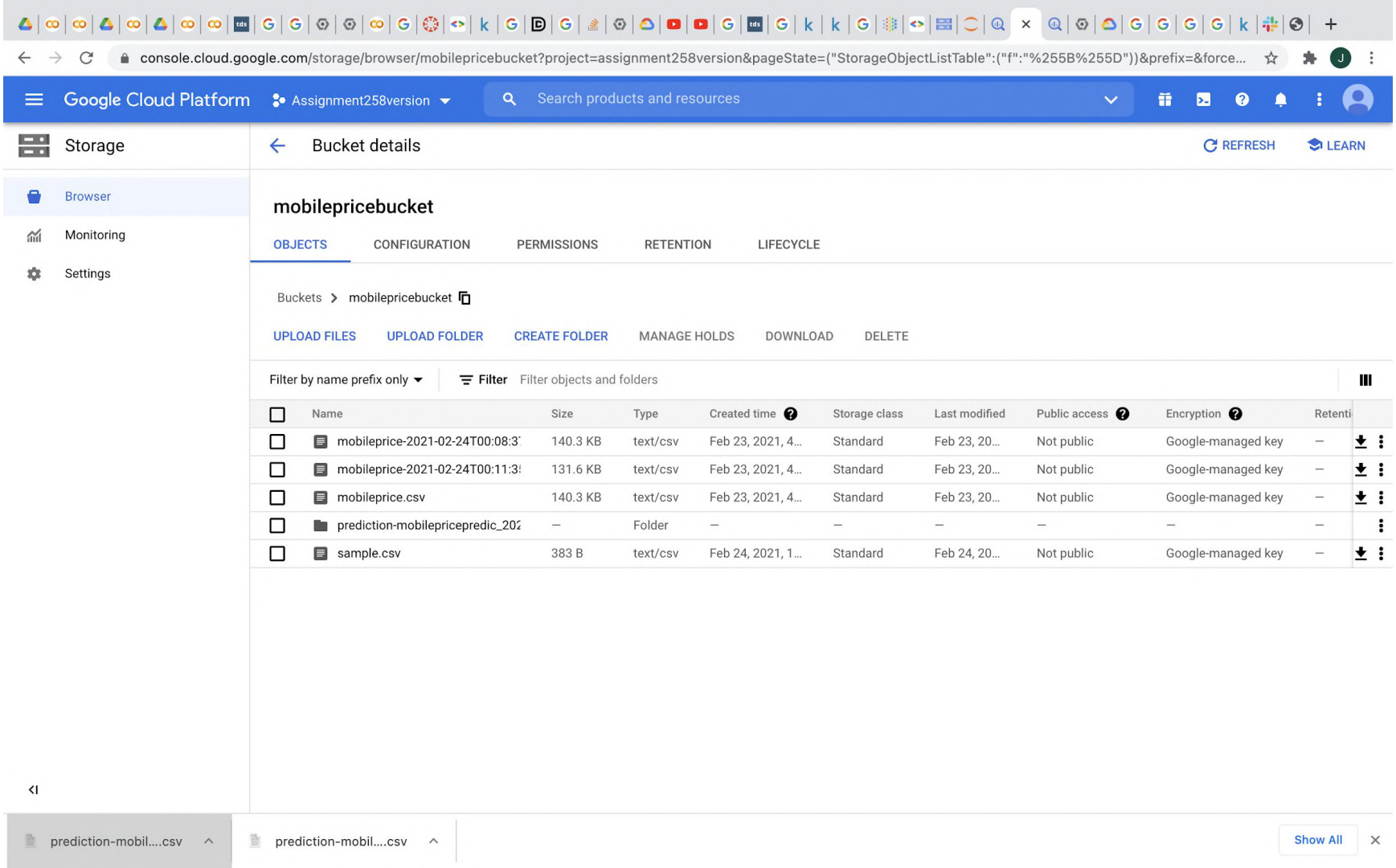
SEND BATCH PREDICTION

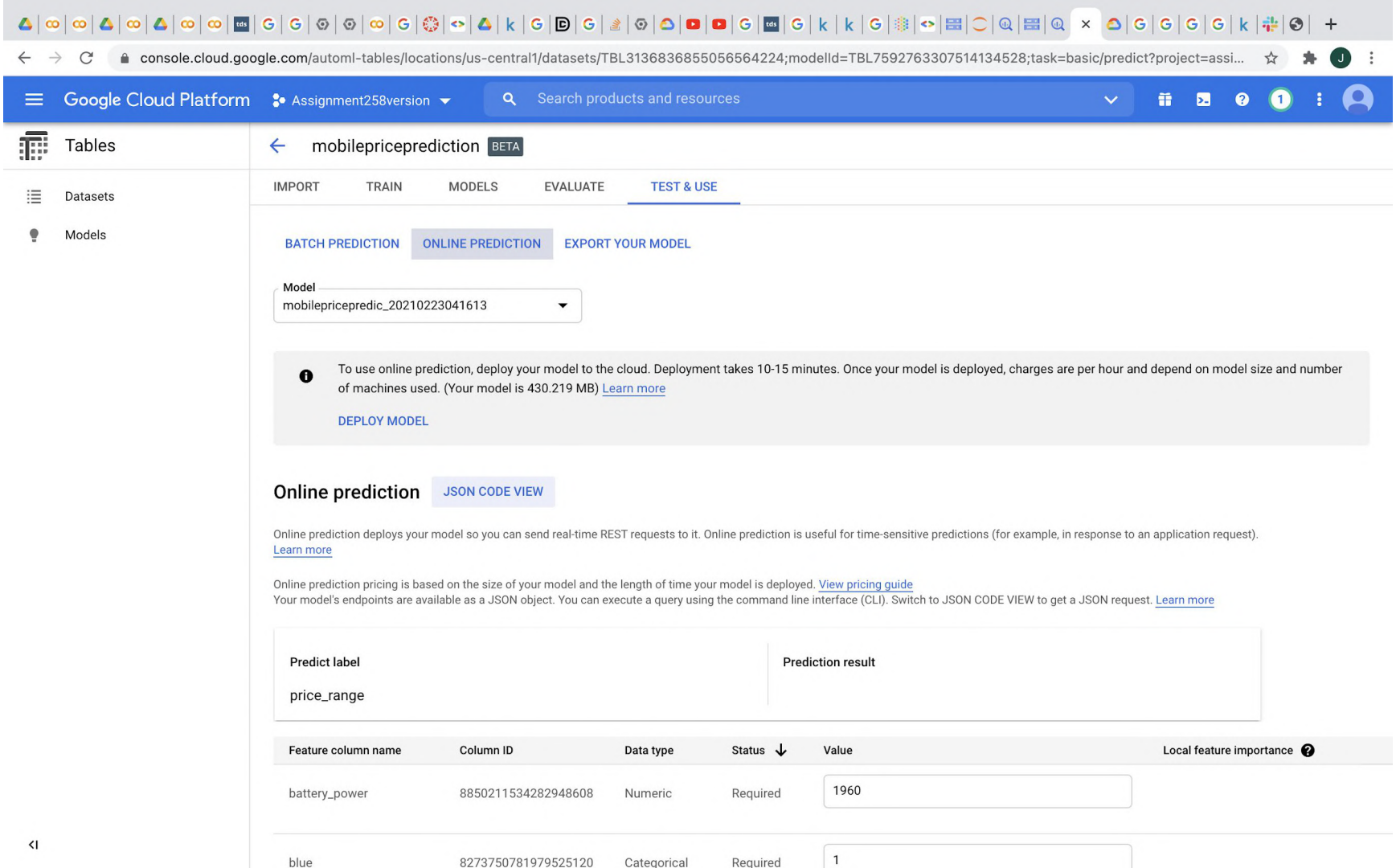
Recent Predictions

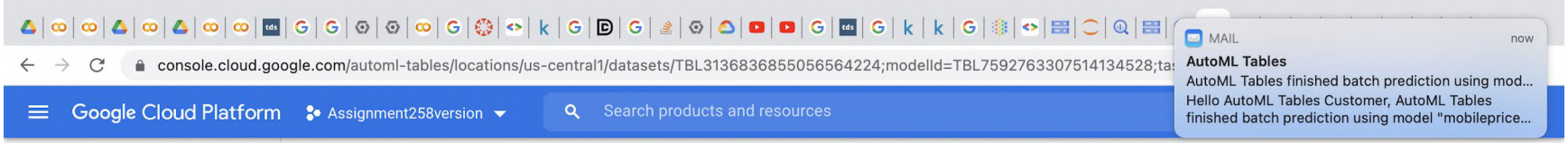
Input	Results directory	Created	Processed in	Status

No rows to display




console.cloud.google.com/storage/browser/mobilepricebucket?project=assignment258version&pageState=("StorageObjectListTable":("f":"%255B%255D"))&prefix=&force...
Google Cloud Platform
Assignment258version
Search products and resources
Storage
Browser
Monitoring
Settings
Bucket details
REFRESH
LEARN
mobilepricebucket
OBJECTS
CONFIGURATION
PERMISSIONS
RETENTION
LIFECYCLE
Buckets > mobilepricebucket
UPLOAD FILES
UPLOAD FOLDER
CREATE FOLDER
MANAGE HOLDS
DOWNLOAD
DELETE
Filter by name prefix only
Filter
Filter objects and folders
Name
Size
Type
Created time
Storage class
Last modified
Public access
Encryption
Retenti
mobileprice-2021-02-24T00:08:3
140.3 KB
text/csv
Feb 23, 2021, 4...
Standard
Feb 23, 20...
Not public
Google-managed key
mobileprice-2021-02-24T00:11:3
131.6 KB
text/csv
Feb 23, 2021, 4...
Standard
Feb 23, 20...
Not public
Google-managed key
mobileprice.csv
140.3 KB
text/csv
Feb 23, 2021, 4...
Standard
Feb 23, 20...
Not public
Google-managed key
prediction-mobilepricepredic_202
Folder
sample.csv
383 B
text/csv
Feb 24, 2021, 1...
Standard
Feb 24, 20...
Not public
Google-managed key
prediction-mobil....csv
prediction-mobil....csv
Show All


console.cloud.google.com/automl-tables/locations/us-central1/datasets/TBL3136836855056564224;modelId=TBL7592763307514134528;task=basic/predict?project=assi...
Google Cloud Platform
Assignment258version
Search products and resources
Tables
Datasets
Models
mobilepricepredication
BETA
IMPORT
TRAIN
MODELS
EVALUATE
TEST & USE
BATCH PREDICTION
ONLINE PREDICTION
EXPORT YOUR MODEL
Model
mobilepricepredic_20210223041613
To use online prediction, deploy your model to the cloud. Deployment takes 10-15 minutes. Once your model is deployed, charges are per hour and depend on model size and number of machines used. (Your model is 430.219 MB) Learn more
DEPLOY MODEL
Online prediction
JSON CODE VIEW
Online prediction deploys your model so you can send real-time REST requests to it. Online prediction is useful for time-sensitive predictions (for example, in response to an application request).
Learn more
Online prediction pricing is based on the size of your model and the length of time your model is deployed. View pricing guide
Your model's endpoints are available as a JSON object. You can execute a query using the command line interface (CLI). Switch to JSON CODE VIEW to get a JSON request. Learn more
Predict label
price_range
Prediction result
Feature column name
Column ID
Data type
Status
Value
Local feature importance
battery_power
8850211534282948608
Numeric
Required
1960
blue
8273750781979525120
Categorical
Required
1



console.cloud.google.com/automl-tables/locations/us-central1/datasets/TBL3136836855056564224;modelId=TBL7592763307514134528;ta

Google Cloud Platform | Assignment258version | Search products and resources

Tables

- Datasets
- Models

mobilepricepredict... BETA

IMPORT | TRAIN | MODELS | EVALUATE | TEST & USE

CSVs from Cloud Storage

Bucket must be in the us-central1 region

CSV formatting

gs:// BROWSE

Result

BigQuery project

BigQuery Project Id *

Cloud Storage bucket

Bucket must be in the us-central1 region

gs:// BROWSE

Generate feature importance

SEND BATCH PREDICTION

Recent Predictions

Input	Results directory	Created	Processed in	Status
gs://.../sample.csv	prediction-mobilepricepredic_20210223041613-2021-02-24T19:29:27.483302Z	Feb 24, 2021, 11:29:27 AM	4 min 44 sec	

Tables

- Datasets
- Models

mobilepricepredication BETA

IMPORT | TRAIN | MODELS | EVALUATE | TEST & USE

Model: mobilepricepredic_20210223041613

Multi-class classification model
Feb 23, 2021, 4:16:59 PM
Training cost: 0.985 node hours

Target	Feature columns	Optimized for	AUC PR	AUC ROC	Precision	Recall	Log loss
price_range	20 included 200 test rows	Log loss	0.998	0.998	98.5%	98.5%	0.042

Micro-averaged precision and recall are generated using a score threshold of 0.5

→ EXPORT PREDICTIONS ON TEST DATASET TO BIGQUERY

You have up to 30 days to export your test dataset to BigQuery

Filter: Filter labels

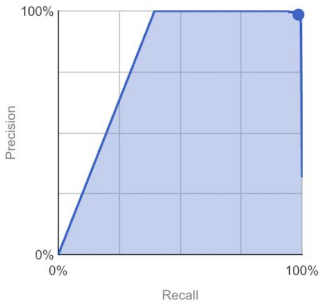
- All
- 1
- 2
- 3
- 0

All

Score threshold: 0.50

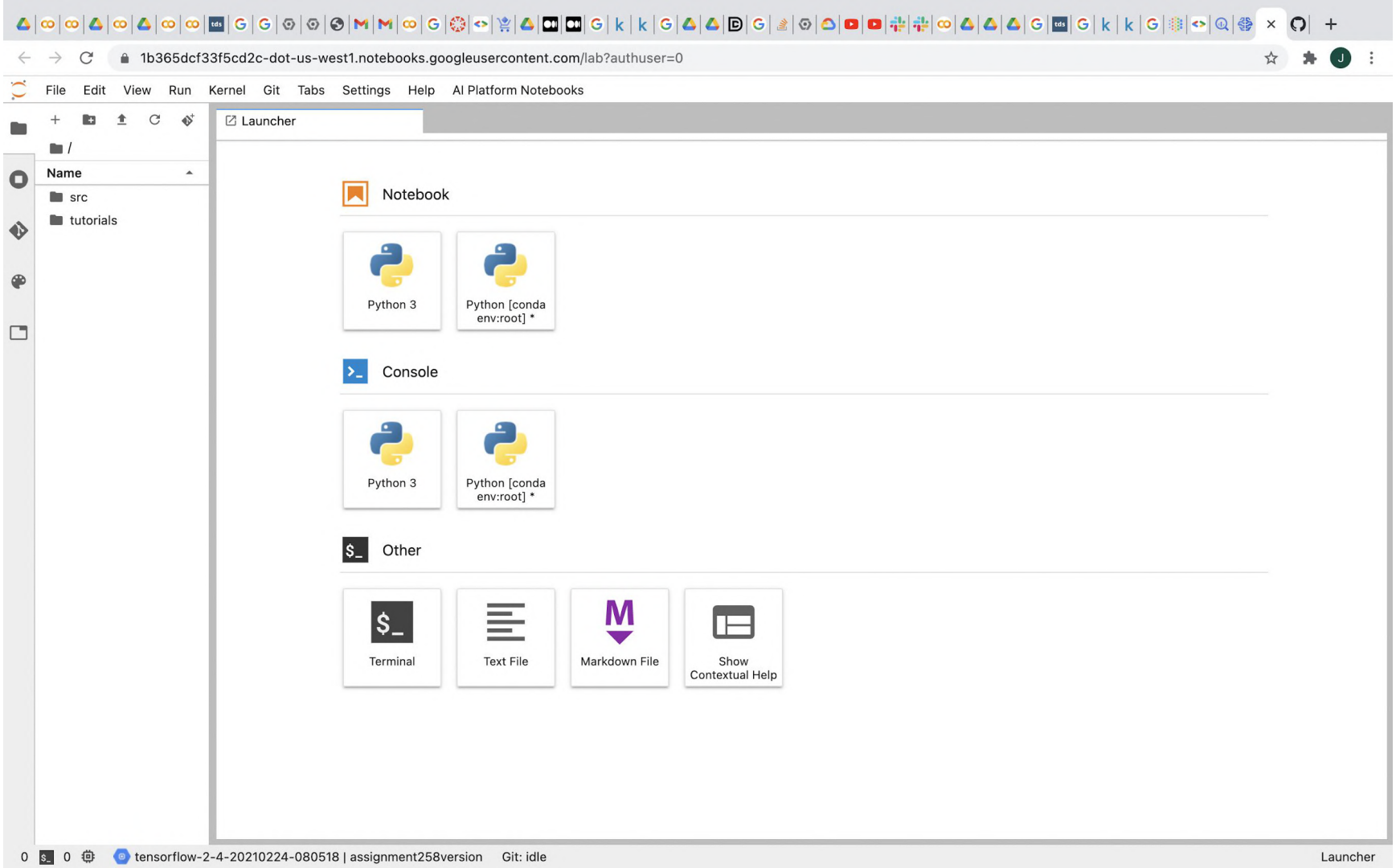
F1 score	0.985
Precision	98.5% (197/200)
True positive rate (Recall)	98.5% (197/200)
False positive rate	0.005 (3/600)

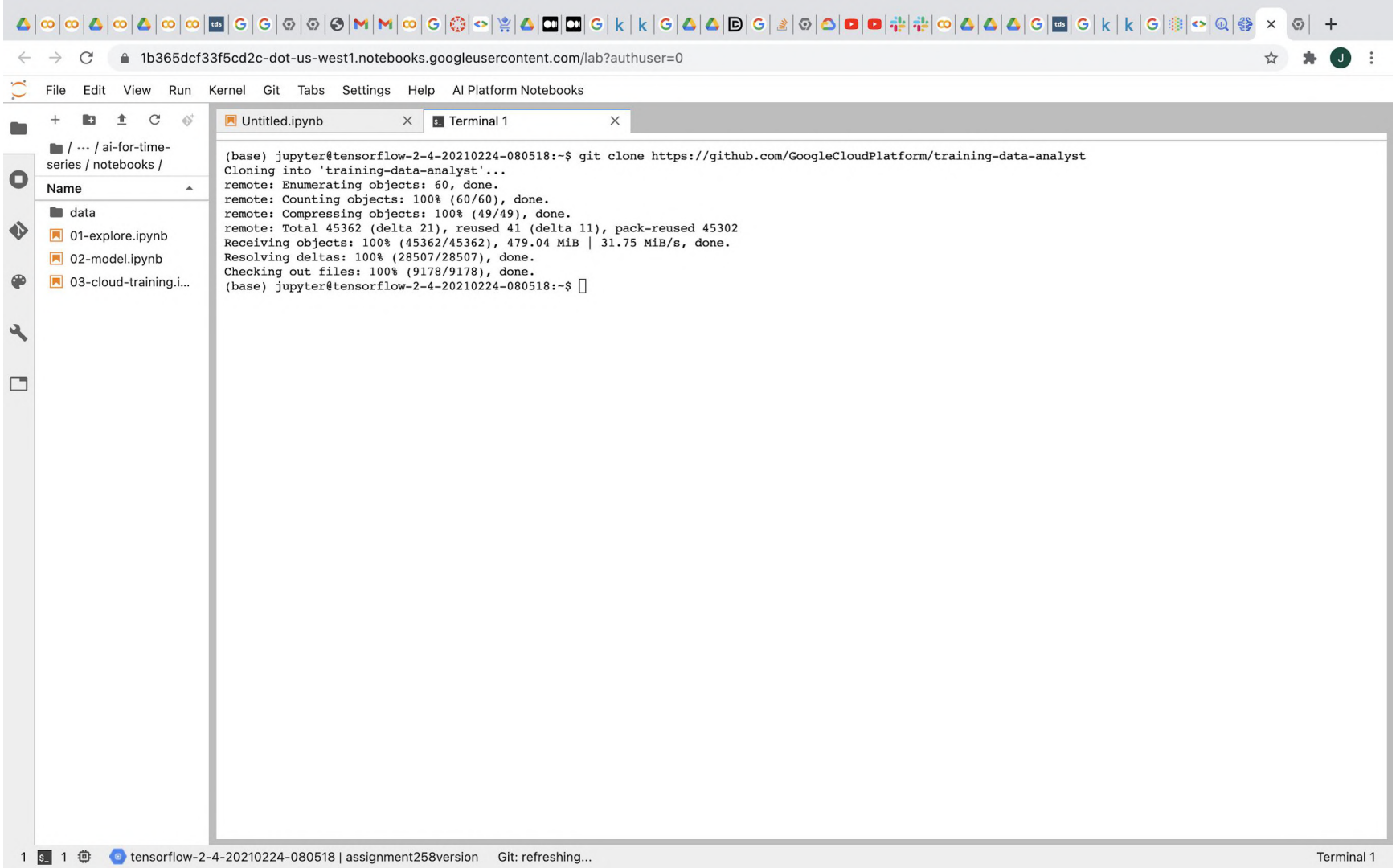
The score threshold determines the minimum level of confidence needed to make a prediction positive. Learn more about model evaluation

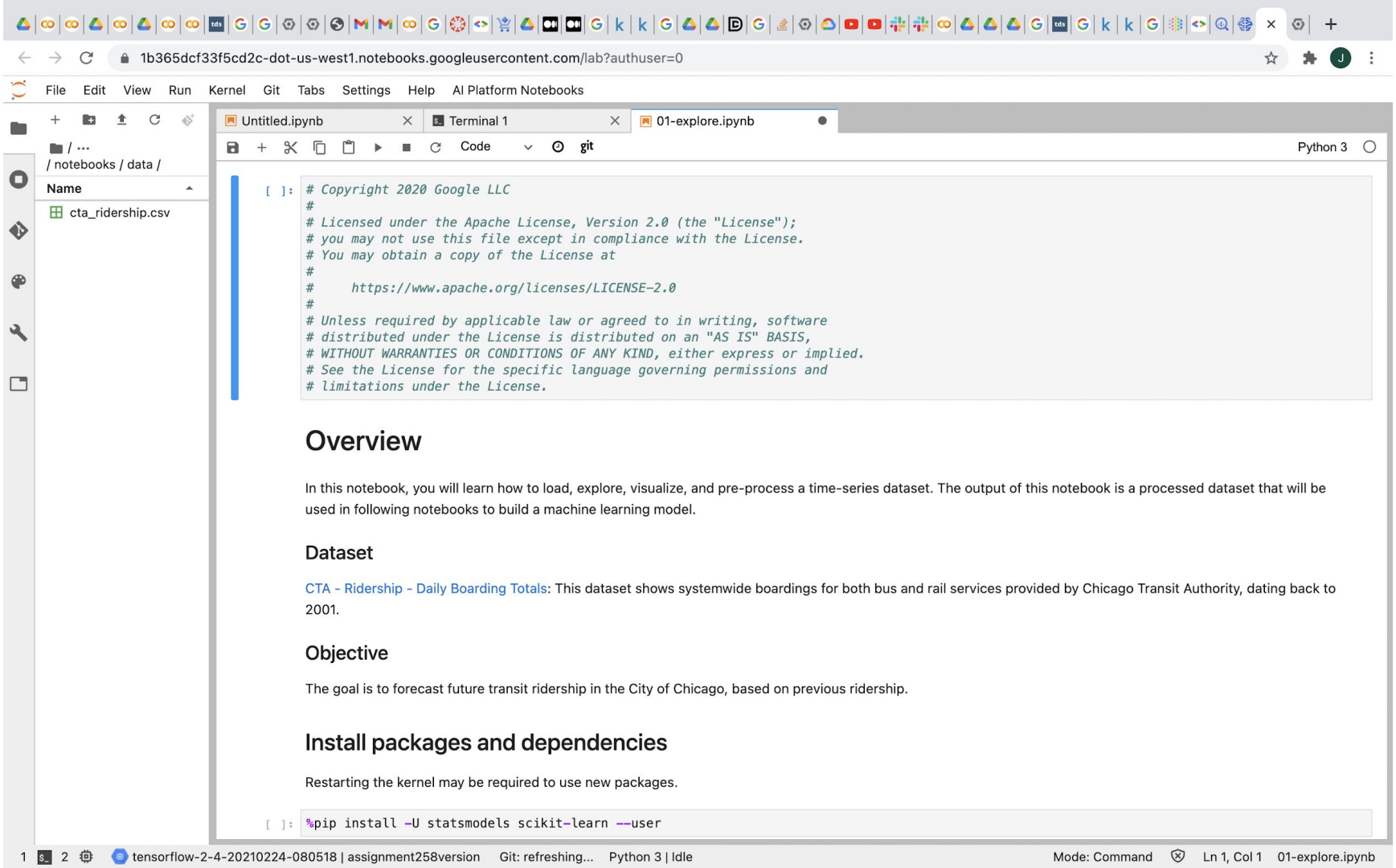


AUC: 0.998 PRC

Part 2) Time series


1b365dcf33f5cd2c-dot-us-west1.notebooks.googleusercontent.com/lab?authuser=0
File Edit View Run Kernel Git Tabs Settings Help AI Platform Notebooks
Launcher
/
Name
src
tutorials
Notebook
Python 3
Python [conda env:root] *
Console
Python 3
Python [conda env:root] *
Other
Terminal
Text File
Markdown File
Show Contextual Help
0 0 tensorflow-2-4-20210224-080518 | assignment258version Git: idle
Launcher


1b365dcf33f5cd2c-dot-us-west1.notebooks.googleusercontent.com/lab?authuser=0
File Edit View Run Kernel Git Tabs Settings Help AI Platform Notebooks
/ ··· / ai-for-time-series / notebooks /
Name
data
01-explore.ipynb
02-model.ipynb
03-cloud-training.i...
Untitled.ipynb
Terminal 1
(base) jupyter@tensorflow-2-4-20210224-080518:~$ git clone https://github.com/GoogleCloudPlatform/training-data-analyst
Cloning into 'training-data-analyst'...
remote: Enumerating objects: 60, done.
remote: Counting objects: 100% (60/60), done.
remote: Compressing objects: 100% (49/49), done.
remote: Total 45362 (delta 21), reused 41 (delta 11), pack-reused 45302
Receiving objects: 100% (45362/45362), 479.04 MiB | 31.75 MiB/s, done.
Resolving deltas: 100% (28507/28507), done.
Checking out files: 100% (9178/9178), done.
(base) jupyter@tensorflow-2-4-20210224-080518:~$
1 1 tensorflow-2-4-20210224-080518 | assignment258version Git: refreshing... Terminal 1


1b365dcf33f5cd2c-dot-us-west1.notebooks.googleusercontent.com/lab?authuser=0
File Edit View Run Kernel Git Tabs Settings Help AI Platform Notebooks
/ notebooks / data /
Name
cta_ridership.csv
Untitled.ipynb
Terminal 1
01-explore.ipynb
Code
git
Python 3
[ ]:
Copyright 2020 Google LLC
#
Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
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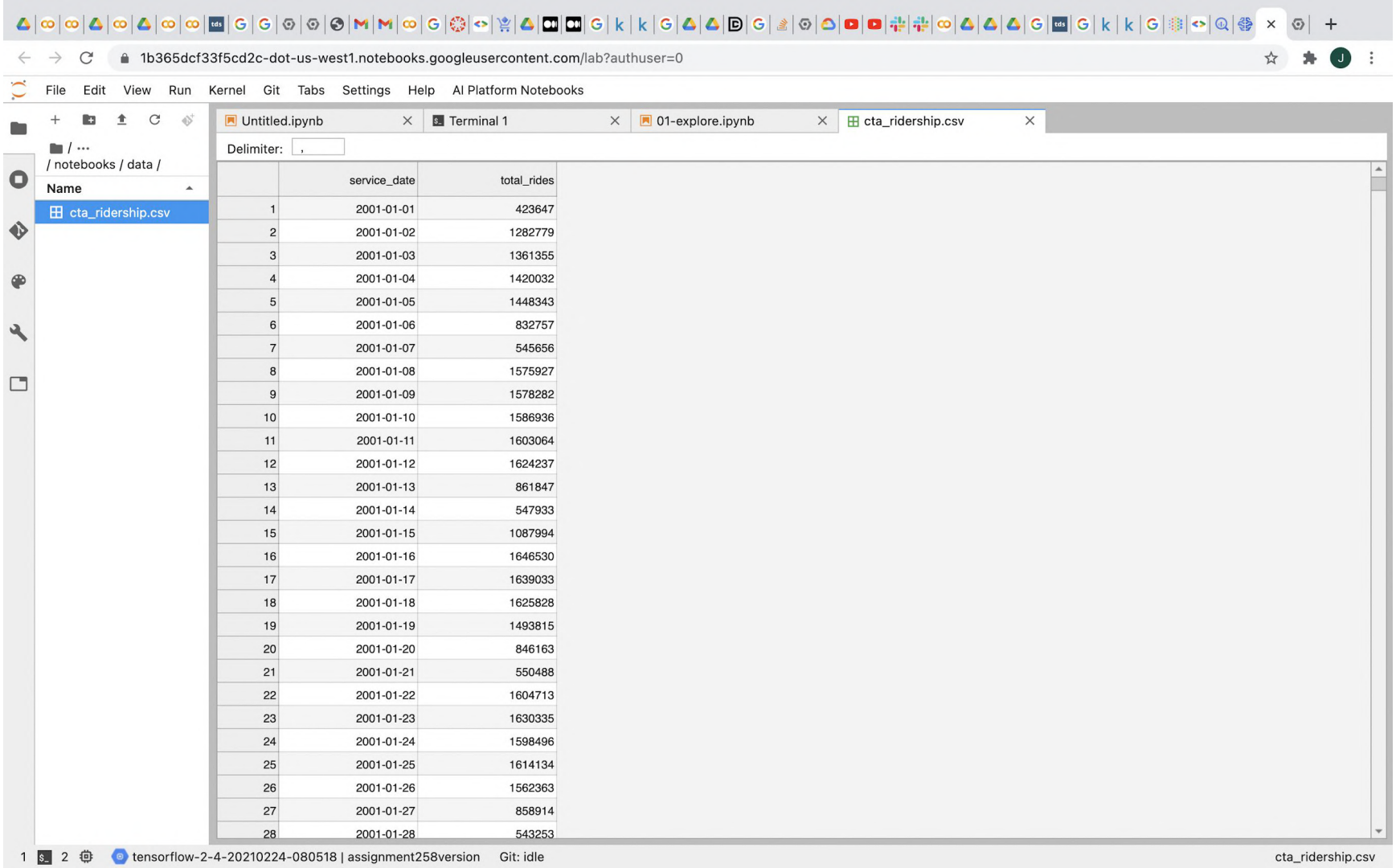
#
https://www.apache.org/licenses/LICENSE-2.0
#
Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
Overview
In this notebook, you will learn how to load, explore, visualize, and pre-process a time-series dataset. The output of this notebook is a processed dataset that will be used in following notebooks to build a machine learning model.
Dataset
CTA - Ridership - Daily Boarding Totals: This dataset shows systemwide boardings for both bus and rail services provided by Chicago Transit Authority, dating back to 2001.
Objective
The goal is to forecast future transit ridership in the City of Chicago, based on previous ridership.
Install packages and dependencies
Restarting the kernel may be required to use new packages.
[ ]:
%pip install -U statsmodels scikit-learn --user
1 2 tensorflow-2-4-20210224-080518 | assignment258version Git: refreshing... Python 3 | Idle
Mode: Command Ln 1, Col 1 01-explore.ipynb


1b365dcf33f5cd2c-dot-us-west1.notebooks.googleusercontent.com/lab?authuser=0
File Edit View Run Kernel Git Tabs Settings Help AI Platform Notebooks
/ notebooks / data /
Name
cta_ridership.csv
Untitled.ipynb
Terminal 1
01-explore.ipynb
cta_ridership.csv
Delimiter: ,
service_date total_rides
1 2001-01-01 423647
2 2001-01-02 1282779
3 2001-01-03 1361355
4 2001-01-04 1420032
5 2001-01-05 1448343
6 2001-01-06 832757
7 2001-01-07 545656
8 2001-01-08 1575927
9 2001-01-09 1578282
10 2001-01-10 1586936
11 2001-01-11 1603064
12 2001-01-12 1624237
13 2001-01-13 861847
14 2001-01-14 547933
15 2001-01-15 1087994
16 2001-01-16 1646530
17 2001-01-17 1639033
18 2001-01-18 1625828
19 2001-01-19 1493815
20 2001-01-20 846163
21 2001-01-21 550488
22 2001-01-22 1604713
23 2001-01-23 1630335
24 2001-01-24 1598496
25 2001-01-25 1614134
26 2001-01-26 1562363
27 2001-01-27 858914
28 2001-01-28 543253
tensorflow-2-4-20210224-080518 | assignment258version
Git: idle
cta_ridership.csv

console.cloud.google.com/bigquery?project=assignment258version&p=assignment258version&page=project

Google Cloud Platform | Assignment258version | Search products and resources

BigQuery

FEATURES & INFO | SHORTCUT | HIDE PREVIEW FEATURES

- SQL workspace
- Data transfers
- Scheduled queries
- Reservations
- BI Engine

Explorer | + ADD DATA

Type to search

Viewing pinned projects.

assignment258version

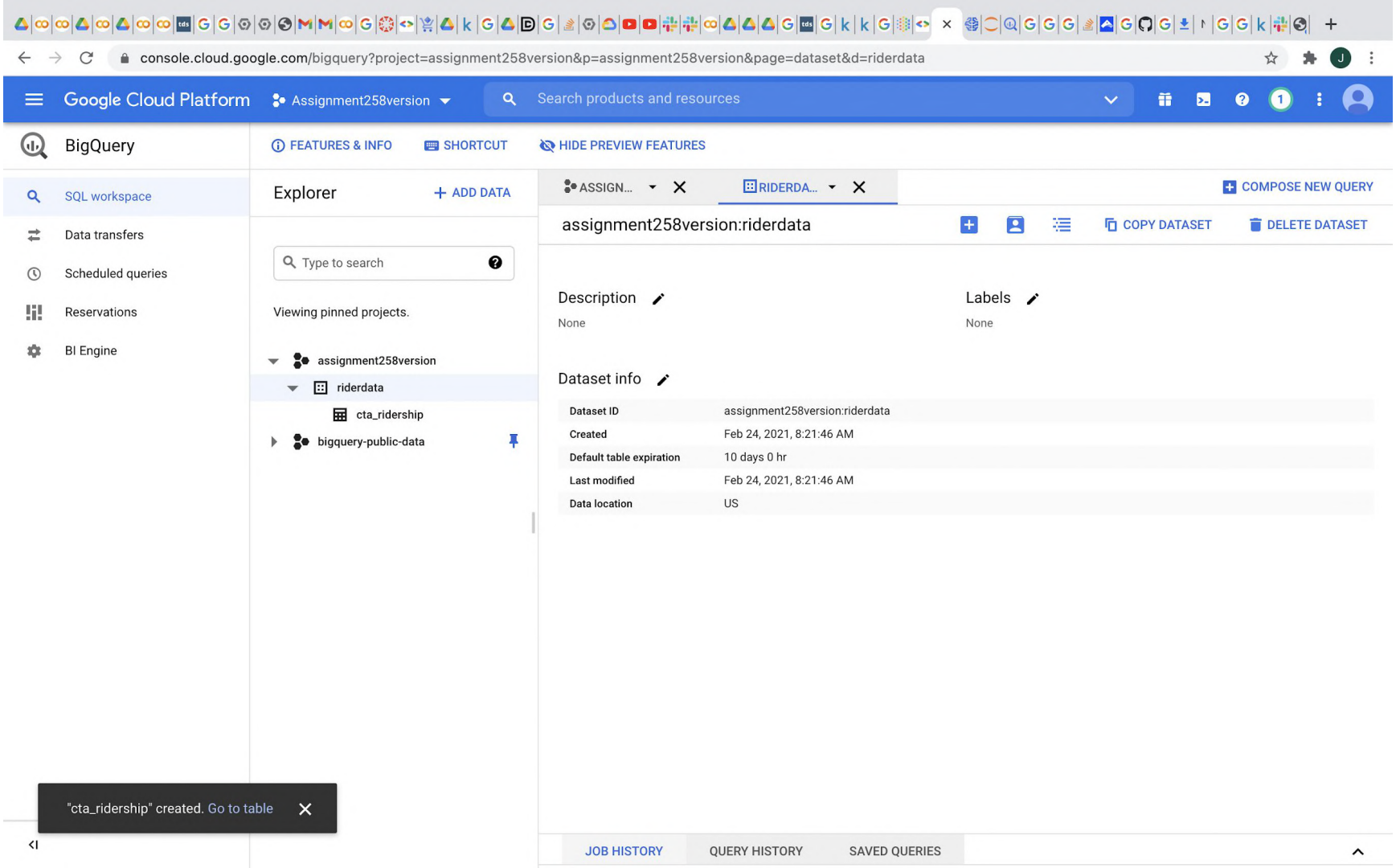
EDITOR | ASSIGN... | COMPOSE NEW QUERY

assignment258version | CREATE DATASET | PIN PROJECT

Resources in this project

Use the Explorer panel to view your data, or create a new dataset using the Create Dataset option above.

JOB HISTORY | QUERY HISTORY | SAVED QUERIES


console.cloud.google.com/bigquery?project=assignment258version&p=assignment258version&page=dataset&d=riderdata
Google Cloud Platform
Assignment258version
Search products and resources
BigQuery
FEATURES & INFO
SHORTCUT
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SQL workspace
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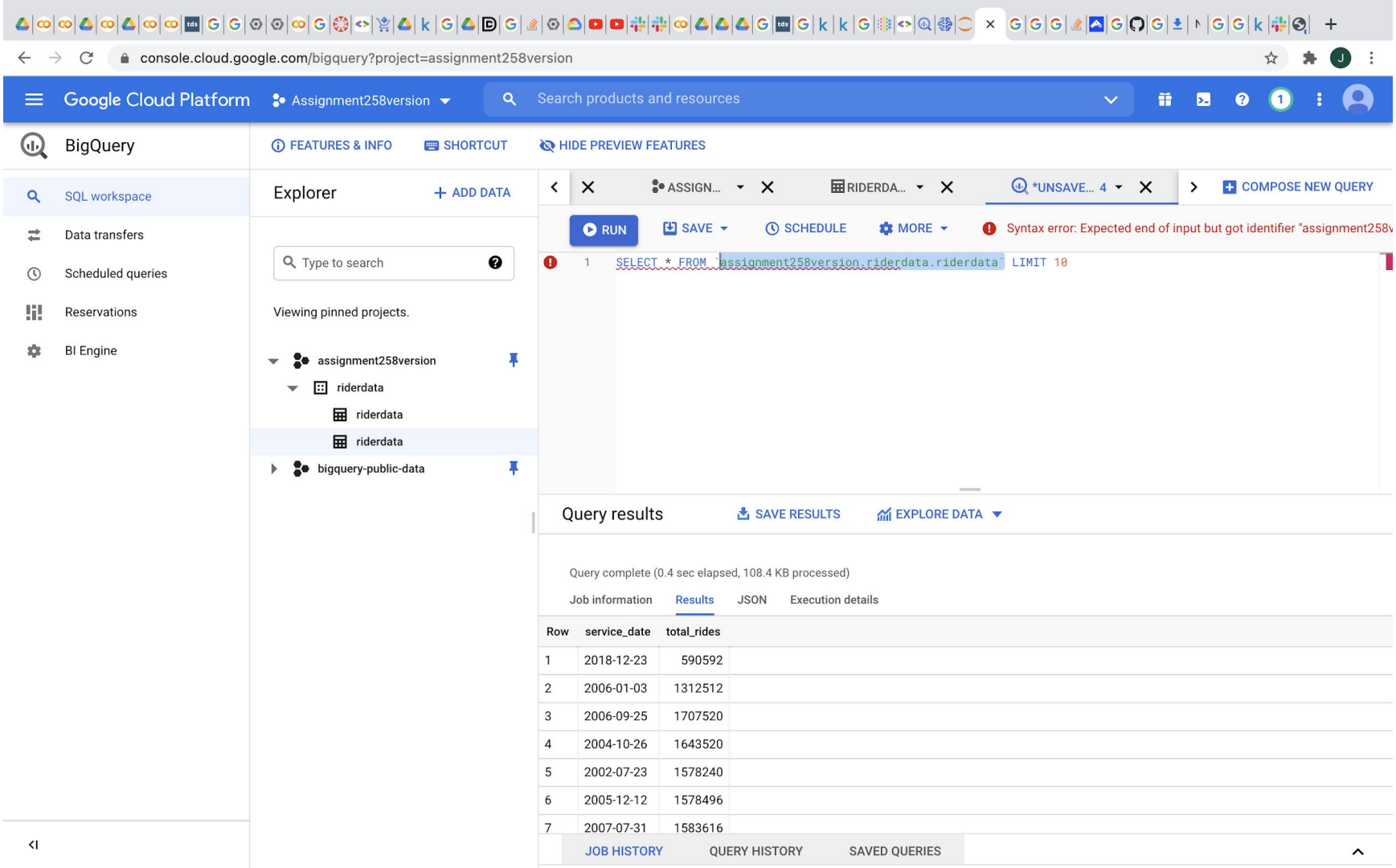
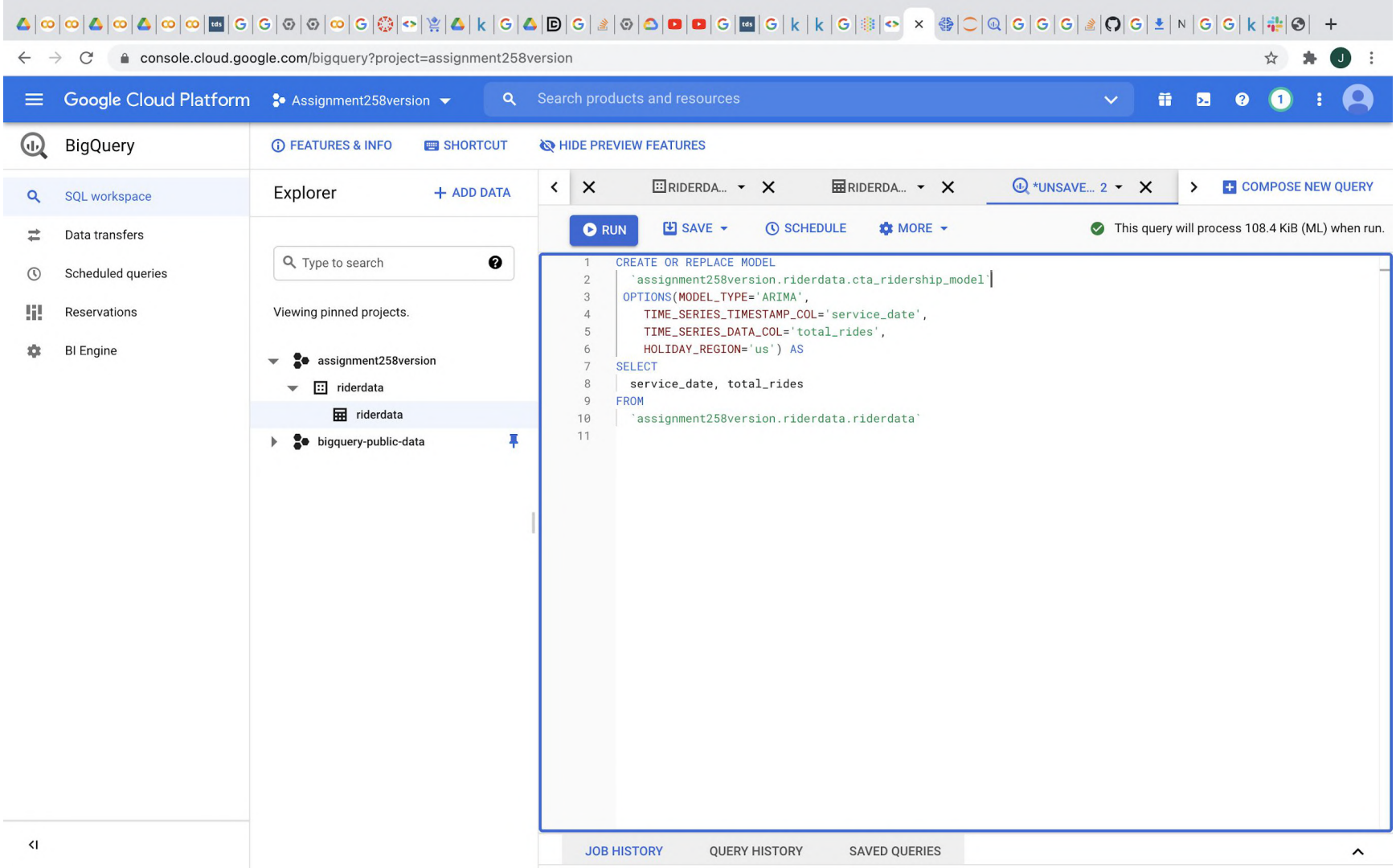
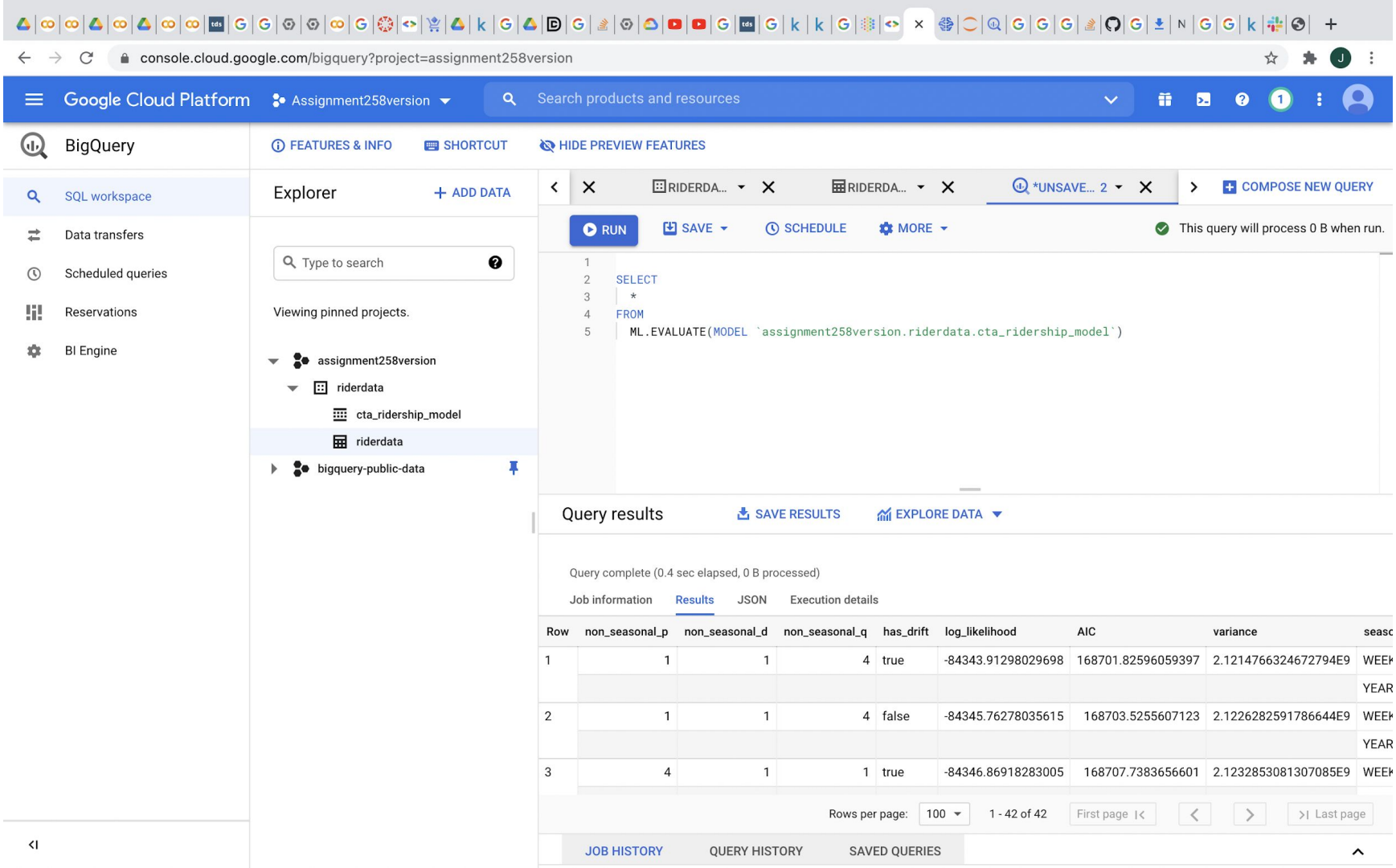
Explorer
ADD DATA
Type to search
Viewing pinned projects.
assignment258version
riderdata
cta_ridership
bigquery-public-data
ASSIGN...
RIDERDA...
COMPOSE NEW QUERY
assignment258version:riderdata
COPY DATASET
DELETE DATASET
Description
None
Labels
None
Dataset info
Dataset ID
assignment258version:riderdata
Created
Feb 24, 2021, 8:21:46 AM
Default table expiration
10 days 0 hr
Last modified
Feb 24, 2021, 8:21:46 AM
Data location
US
"cta_ridership" created. Go to table
JOB HISTORY
QUERY HISTORY
SAVED QUERIES



Row	service_date	total_rides
1	2018-12-23	590592
2	2006-01-03	1312512
3	2006-09-25	1707520
4	2004-10-26	1643520
5	2002-07-23	1578240
6	2005-12-12	1578496
7	2007-07-31	1583616


console.cloud.google.com/bigquery?project=assignment258version
Google Cloud Platform
Assignment258version
Search products and resources
BigQuery
FEATURES & INFO
SHORTCUT
HIDE PREVIEW FEATURES
SQL workspace
Data transfers
Scheduled queries
Reservations
BI Engine
Explorer
ADD DATA
Type to search
Viewing pinned projects.
assignment258version
riderdata
riderdata
bigquery-public-data
RIDERDA...
RIDERDA...
*UNSAVE... 2
COMPOSE NEW QUERY
RUN
SAVE
SCHEDULE
MORE
This query will process 108.4 KiB (ML) when run.
1 CREATE OR REPLACE MODEL
2 `assignment258version.riderdata.cta_ridership_model`
3 OPTIONS(MODEL_TYPE='ARIMA',
4 TIME_SERIES_TIMESTAMP_COL='service_date',
5 TIME_SERIES_DATA_COL='total_rides',
6 HOLIDAY_REGION='us') AS
7 SELECT
8 service_date, total_rides
9 FROM
10 `assignment258version.riderdata.riderdata`
11
JOB HISTORY
QUERY HISTORY
SAVED QUERIES


console.cloud.google.com/bigquery?project=assignment258version
Google Cloud Platform
Assignment258version
Search products and resources
BigQuery
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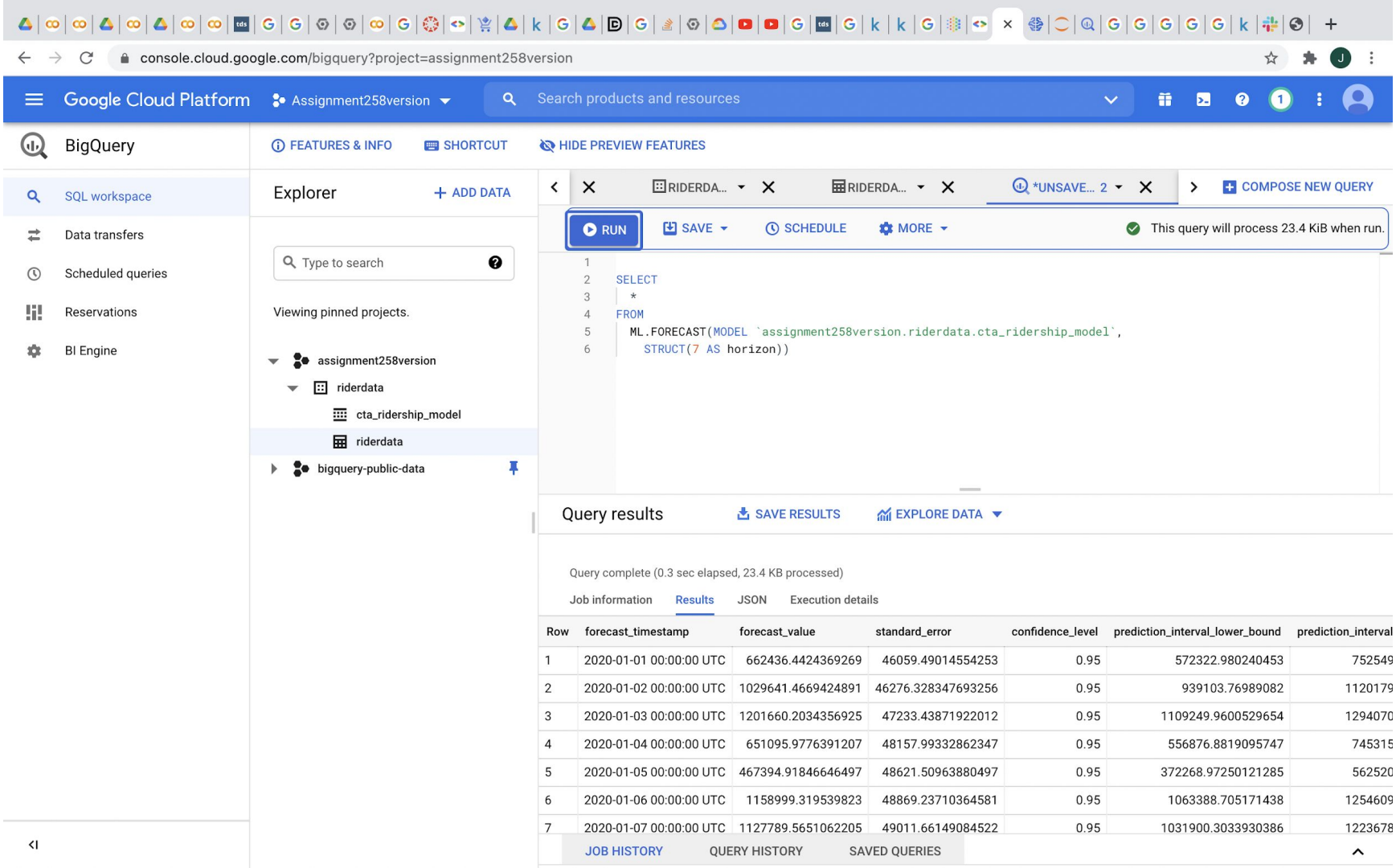
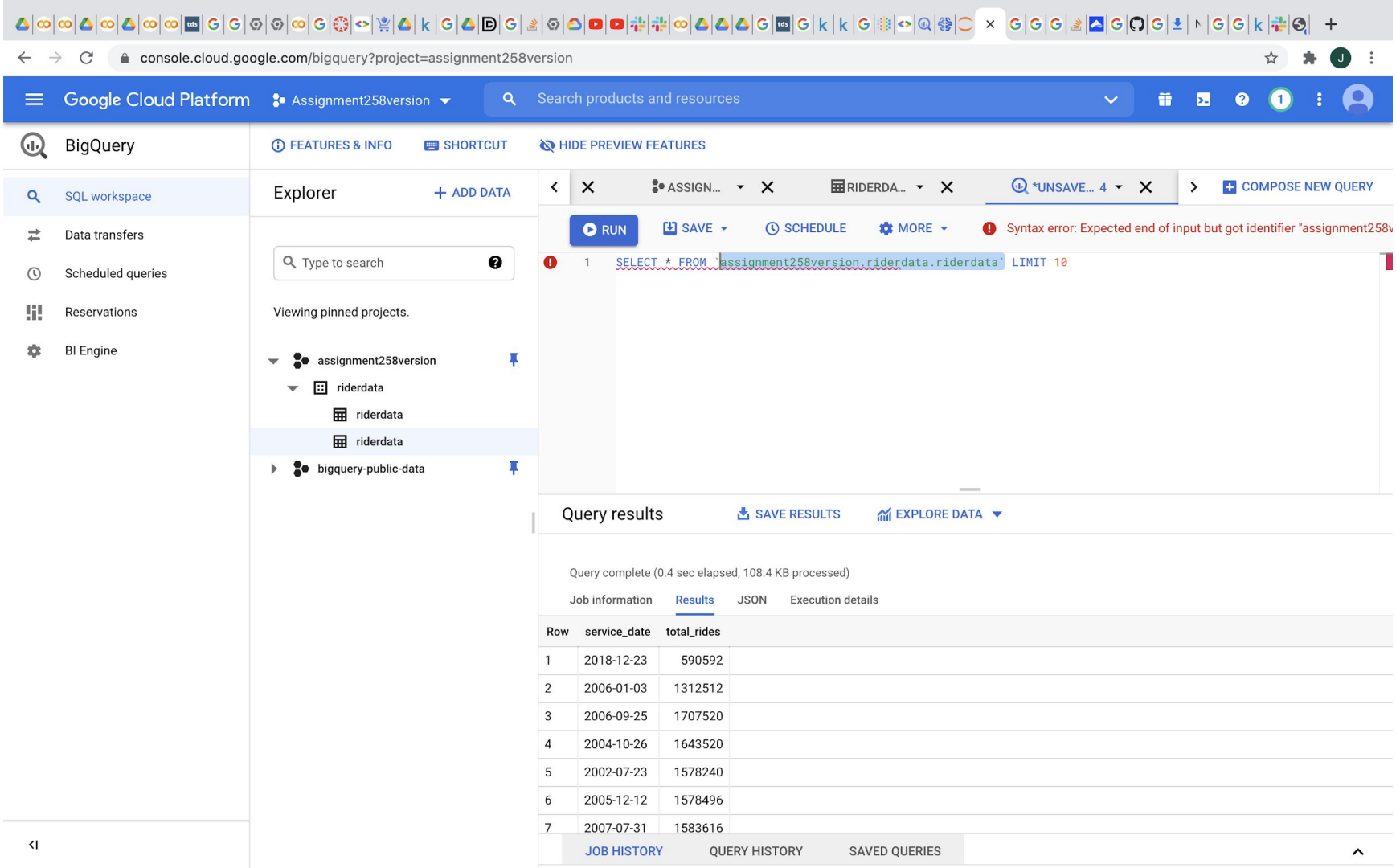
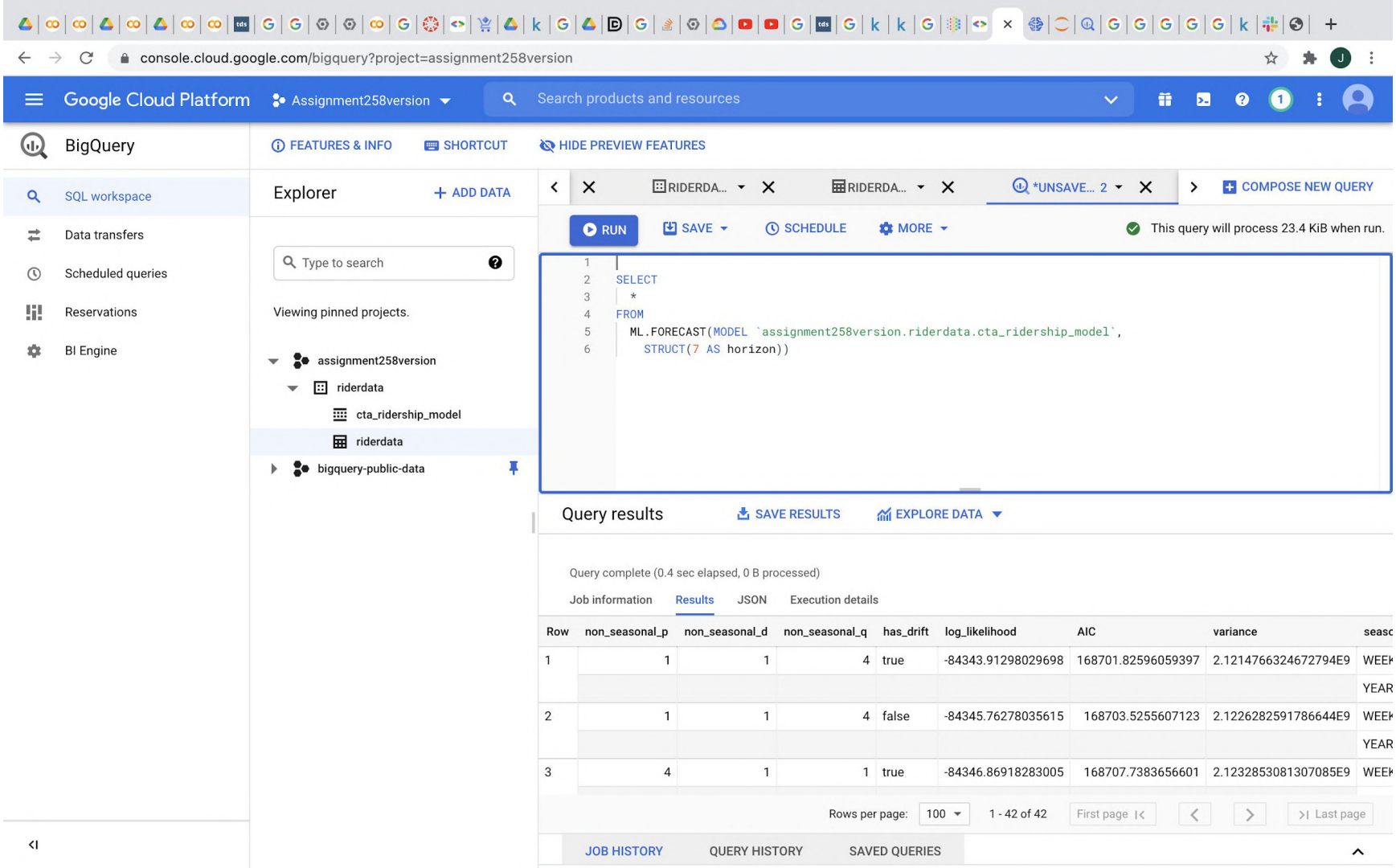
Viewing pinned projects.
assignment258version
riderdata
cta_ridership_model
riderdata
bigquery-public-data
RIDERDA...
RIDERDA...
*UNSAVE... 2
COMPOSE NEW QUERY
RUN
SAVE
SCHEDULE
MORE
This query will process 0 B when run.
1
2 SELECT
3 *
4 FROM
5 ML.EVALUATE(MODEL `assignment258version.riderdata.cta_ridership_model`)
Query results
SAVE RESULTS
EXPLORE DATA
Query complete (0.4 sec elapsed, 0 B processed)
Job information
Results
JSON
Execution details
Row
non_seasonal_p
non_seasonal_d
non_seasonal_q
has_drift
log_likelihood
AIC
variance
seasc
1
1
1
4
true
-84343.91298029698
168701.82596059397
2.1214766324672794E9
WEEK
YEAR
2
1
1
4
false
-84345.76278035615
168703.5255607123
2.1226282591786644E9
WEEK
YEAR
3
4
1
1
true
-84346.86918283005
168707.7383656601
2.1232853081307085E9
WEEK
Rows per page:
100
1 - 42 of 42
First page
Last page
JOB HISTORY
QUERY HISTORY
SAVED QUERIES


console.cloud.google.com/bigquery?project=assignment258version
Google Cloud Platform
Assignment258version
Search products and resources
BigQuery
FEATURES & INFO
SHORTCUT
HIDE PREVIEW FEATURES
SQL workspace
Data transfers
Scheduled queries
Reservations
BI Engine
Explorer
ADD DATA
Type to search
Viewing pinned projects.
assignment258version
riderdata
cta_ridership_model
riderdata
bigquery-public-data
RIDERDA...
RIDERDA...
*UNSAVE... 2
COMPOSE NEW QUERY
RUN
SAVE
SCHEDULE
MORE
This query will process 23.4 KiB when run.
1 SELECT
2 *
3 FROM
4 ML.FORECAST(MODEL `assignment258version.riderdata.cta_ridership_model`,
5 STRUCT(7 AS horizon))
Query results
SAVE RESULTS
EXPLORE DATA
Query complete (0.3 sec elapsed, 23.4 KB processed)
Job information
Results
JSON
Execution details
Row forecast_timestamp forecast_value standard_error confidence_level prediction_interval_lower_bound prediction_interval
1 2020-01-01 00:00:00 UTC 662436.4424369269 46059.49014554253 0.95 572322.980240453 752549
2 2020-01-02 00:00:00 UTC 1029641.4669424891 46276.328347693256 0.95 939103.76989082 1120179
3 2020-01-03 00:00:00 UTC 1201660.2034356925 47233.43871922012 0.95 1109249.9600529654 1294070
4 2020-01-04 00:00:00 UTC 651095.9776391207 48157.99332862347 0.95 556876.8819095747 745315
5 2020-01-05 00:00:00 UTC 467394.91846646497 48621.50963880497 0.95 372268.97250121285 562520
6 2020-01-06 00:00:00 UTC 1158999.319539823 48869.23710364581 0.95 1063388.705171438 1254609
7 2020-01-07 00:00:00 UTC 1127789.5651062205 49011.66149084522 0.95 1031900.3033930386 1223678
JOB HISTORY
QUERY HISTORY
SAVED QUERIES



Row	service_date	total_rides
1	2018-12-23	590592
2	2006-01-03	1312512
3	2006-09-25	1707520
4	2004-10-26	1643520
5	2002-07-23	1578240
6	2005-12-12	1578496
7	2007-07-31	1583616


console.cloud.google.com/bigquery?project=assignment258version
Google Cloud Platform
Assignment258version
Search products and resources
BigQuery
FEATURES & INFO
SHORTCUT
HIDE PREVIEW FEATURES
SQL workspace
Data transfers
Scheduled queries
Reservations
BI Engine
Explorer
ADD DATA
Type to search
Viewing pinned projects.
assignment258version
riderdata
cta_ridership_model
riderdata
bigquery-public-data
RIDERDA...
RIDERDA...
*UNSAVE... 2
COMPOSE NEW QUERY
RUN
SAVE
SCHEDULE
MORE
This query will process 23.4 KiB when run.
1 SELECT
2 *
3 FROM
4 ML.FORECAST(MODEL `assignment258version.riderdata.cta_ridership_model`,
5 STRUCT(7 AS horizon))
Query results
SAVE RESULTS
EXPLORE DATA
Query complete (0.4 sec elapsed, 0 B processed)
Job information
Results
JSON
Execution details
Row | non_seasonal_p | non_seasonal_d | non_seasonal_q | has_drift | log_likelihood | AIC | variance | seasc
1 | 1 | 1 | 4 | true | -84343.91298029698 | 168701.82596059397 | 2.1214766324672794E9 | WEEK
YEAR
2 | 1 | 1 | 4 | false | -84345.76278035615 | 168703.5255607123 | 2.1226282591786644E9 | WEEK
YEAR
3 | 4 | 1 | 1 | true | -84346.86918283005 | 168707.7383656601 | 2.1232853081307085E9 | WEEK
Rows per page: 100
1 - 42 of 42
First page
Last page
JOB HISTORY
QUERY HISTORY
SAVED QUERIES

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cnn_export	22 minutes ago
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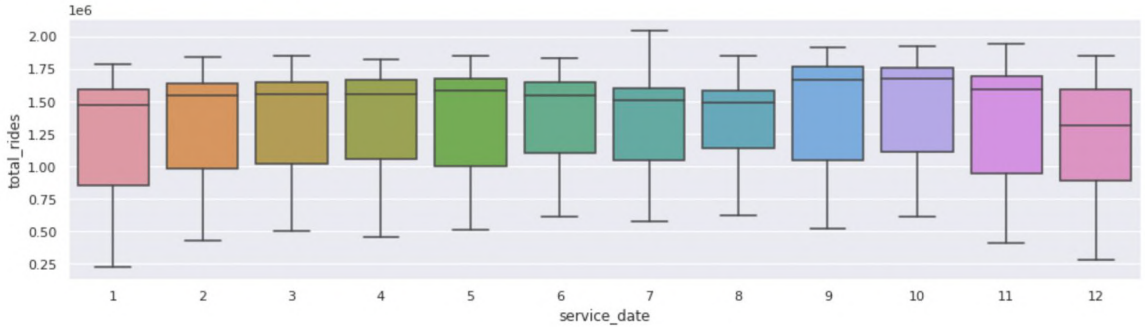
01-explore.ipynb	30 minutes ago
02-model.ipynb	14 minutes ago
03-cloud-training.ipynb	8 minutes ago
cta_ridership.csv	30 minutes ago

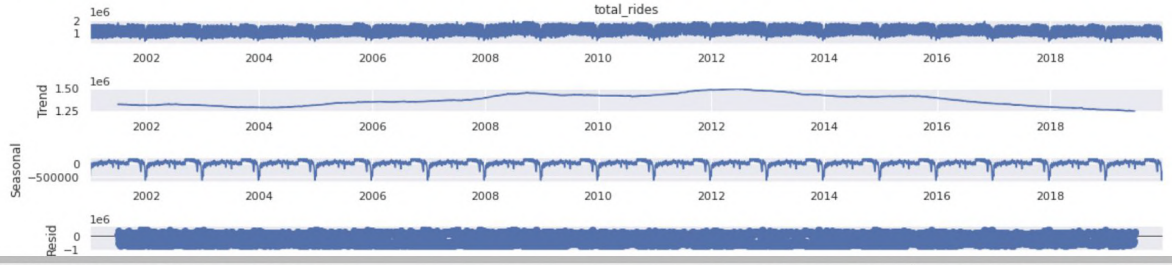
Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ip | cta_ridership.csv

Code git Python 3

[18]:
```
# Show the distribution of values for each month in a boxplot:

months = df.index.to_series().dt.month

fig = sns.boxplot(x=months, y=df[target])
```



[19]:
```
# Decompose the data into trend and seasonal components

result = seasonal_decompose(df[target], period=365)
fig = result.plot()
```



1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: refreshing... Python 3 | Idle Mode: Command Ln 3, Col 39 01-explore.ipynb

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cta_ridership.csv	30 minutes ago

Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ip | cta_ridership.csv

Code git Python 3

[16]:
```
df[target].describe().apply(lambda x: round(x))
```

[16]:
```
count       6939
mean     1368761
std       391443
min       222071
25%      1005394
50%      1548343
75%      1660947
max      2049519
Name: total_rides, dtype: int64
```

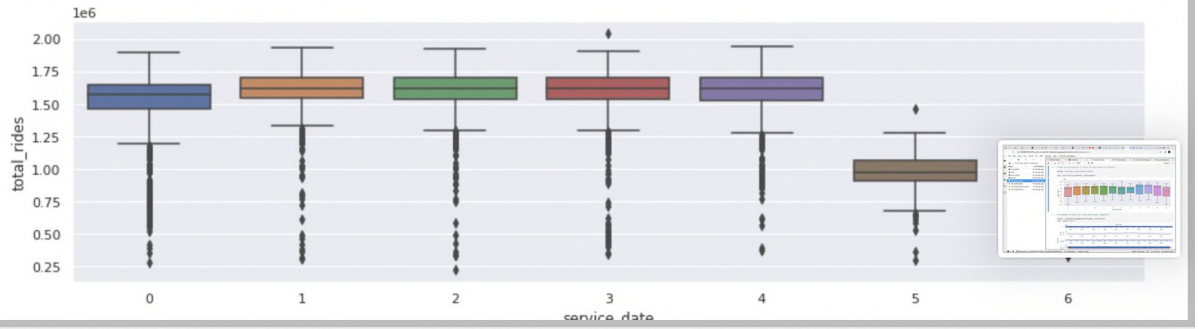
TODO 3: Explore seasonality ¶

- Is there much difference between months?
- Can you extract the trend and seasonal pattern from the data?

[17]:
```
# Show the distribution of values for each day of the week in a boxplot:
# Min, 25th percentile, median, 75th percentile, max

daysofweek = df.index.to_series().dt.dayofweek

fig = sns.boxplot(x=daysofweek, y=df[target])
```



1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: idle Python 3 | Idle Mode: Command Ln 1, Col 48 01-explore.ipynb

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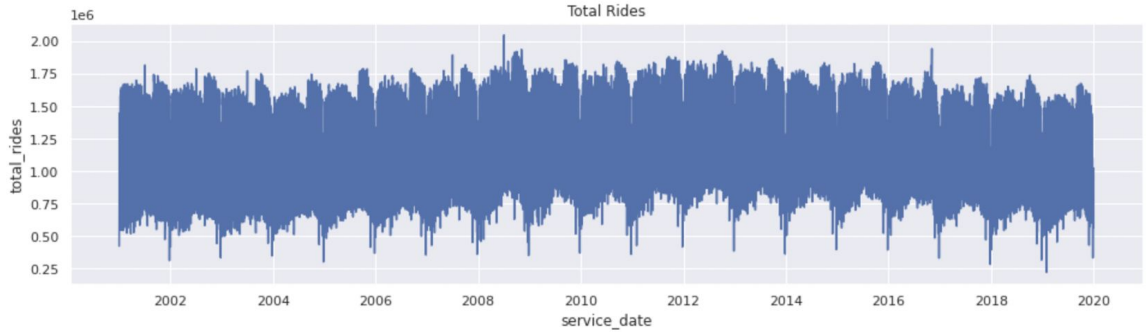
03-cloud-training.ipynb	8 minutes ago
cta_ridership.csv	30 minutes ago

Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ip | cta_ridership.csv

Code git Python 3

```
fig = plt.show()
```



[14]:

```
# Explore rides by day type: Weekday (W), Saturday (A), Sunday/Holiday (U)

sns.lineplot(data=df, x=df.index, y=df[target], hue=df['day_type']).set_title('Total Rides by Day Type')
fig = plt.show()
```

1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: idle Python 3 | Idle Mode: Command Ln 3, Col 105 01-explore.ipynb

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cta_ridership.csv	31 minutes ago

Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ip | cta_ridership.csv

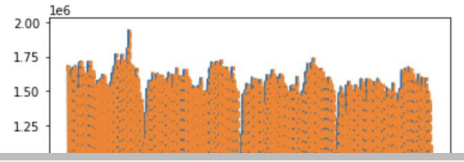
Code git Python 3

[29]:
```
evaluate(y_pred_sn, 0)
```

```
=== t+(1-7) ===
R^2:  0.675
MAPE: 0.11
MAE:  108722.34

=== t+1 ===
R^2:  0.676
MAPE: 0.11
MAE:  108556.529
```


```
=== t+2 ===
R^2:  0.675
MAPE: 0.11
MAE:  108611.732
```



1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: idle Python 3 | Idle Mode: Command Ln 1, Col 23 02-model.ipynb

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cta_ridership.csv	31 minutes ago

Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ipy | cta_ridership.csv

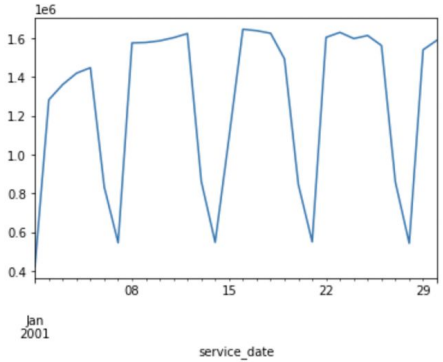
Code git Python 3

[10]:
```
processed_file = 'cta_ridership.csv' # Which file to save the results to

if os.path.exists(processed_file):
    input_file = processed_file # File created in previous lab
else:
    input_file = f'data/{processed_file}'
```

[11]:
```
df = pd.read_csv(input_file, index_col=ts_col, parse_dates=True)

# Plot 30 days of ridership
_ = df[target_col][:30].plot()
```



[12]:
```
# Define some characteristics of the data that will be used later
n_features = len(df.columns)

# Index of target column. Used later when creating dataframes.
target_col_num = df.columns.get_loc(target_col)
```

Process data

1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: refreshing... Python 3 | Busy Mode: Command Ln 1, Col 1 03-cloud-training.ipynb

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03-cloud-training.ipynb	9 minutes ago
cta_ridership.csv	31 minutes ago

Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ipy | cta_ridership.csv

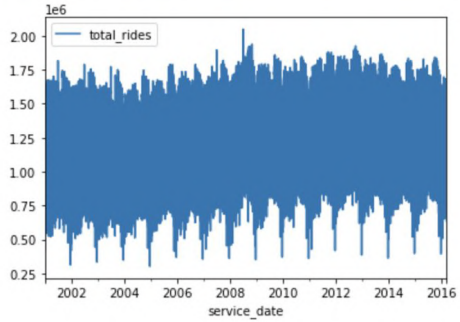
Markdown git Python 3

[13]:
```
# Split data

size = int(len(df) * train_split)
df_train, df_test = df[0:size].copy(deep=True), df[size:len(df)].copy(deep=True)

df_train.head()
```

[13]:

service_date	total_rides
2001-01-01	423647
2001-01-02	1282779
2001-01-03	1361355
2001-01-04	1420032
2001-01-05	1448343

[14]:
```
_ = df_train.plot()
```



Scale values

1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: refreshing... Python 3 | Busy Mode: Command Ln 1, Col 1 03-cloud-training.ipynb

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cta_ridership.csv	32 minutes ago

Untitled1.ipynb | Terminal 1 | 01-explore.ipynb | 02-model.ipynb | 03-cloud-training.ipy | cta_ridership.csv

Markdown git Python 3

```
        body={'instances': instances}
    ).execute()

    if 'error' in response:
        raise RuntimeError(response['error'])

    return response['predictions']
```

[*]:
```
# Predict with the 1st element from the test set

prediction_json = {input_layer_name: X_test[0].tolist()}

pred_val = predict_json(PROJECT, MODEL_NAME, prediction_json)

pred_val
```

[*]:
```
# Print prediction and compare to actual value

print('Predicted riders:', int(round(inverse_scale(np.array([pred_val[0]['dense'][0]]).reshape(1,1))[0][0])))
print('Actual riders:   ', int(round(inverse_scale(np.array([y_test[0]]))[0][0])))
```

Cleanup

[*]:
```
# Delete model version resource
!echo gcloud ai-platform versions delete {version} --model {MODEL_NAME} --quiet

# Delete model resource
!echo gcloud ai-platform models delete {MODEL_NAME} --quiet
```

Conclusion

In this section, you've learned how to:

- Prepare data and models for training in the cloud
- Train your model and monitor the progress of the job with AI Platform Training
- Predict using the model with AI Platform Predictions

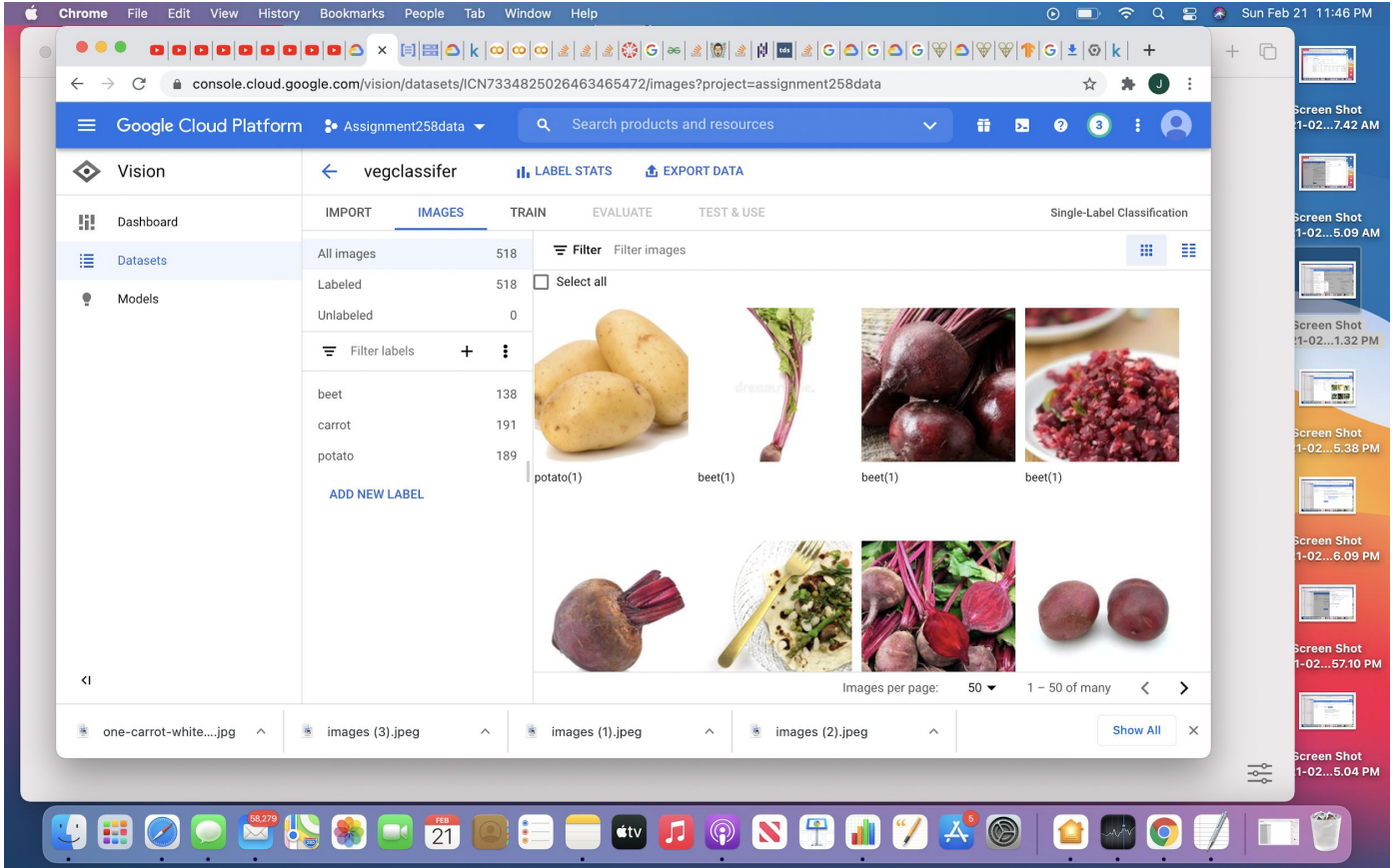
1 5 tensorflow-2-4-20210224-103124 | assignment258version Git: idle Python 3 | Busy Mode: Command Ln 1, Col 1 03-cloud-training.ipynb

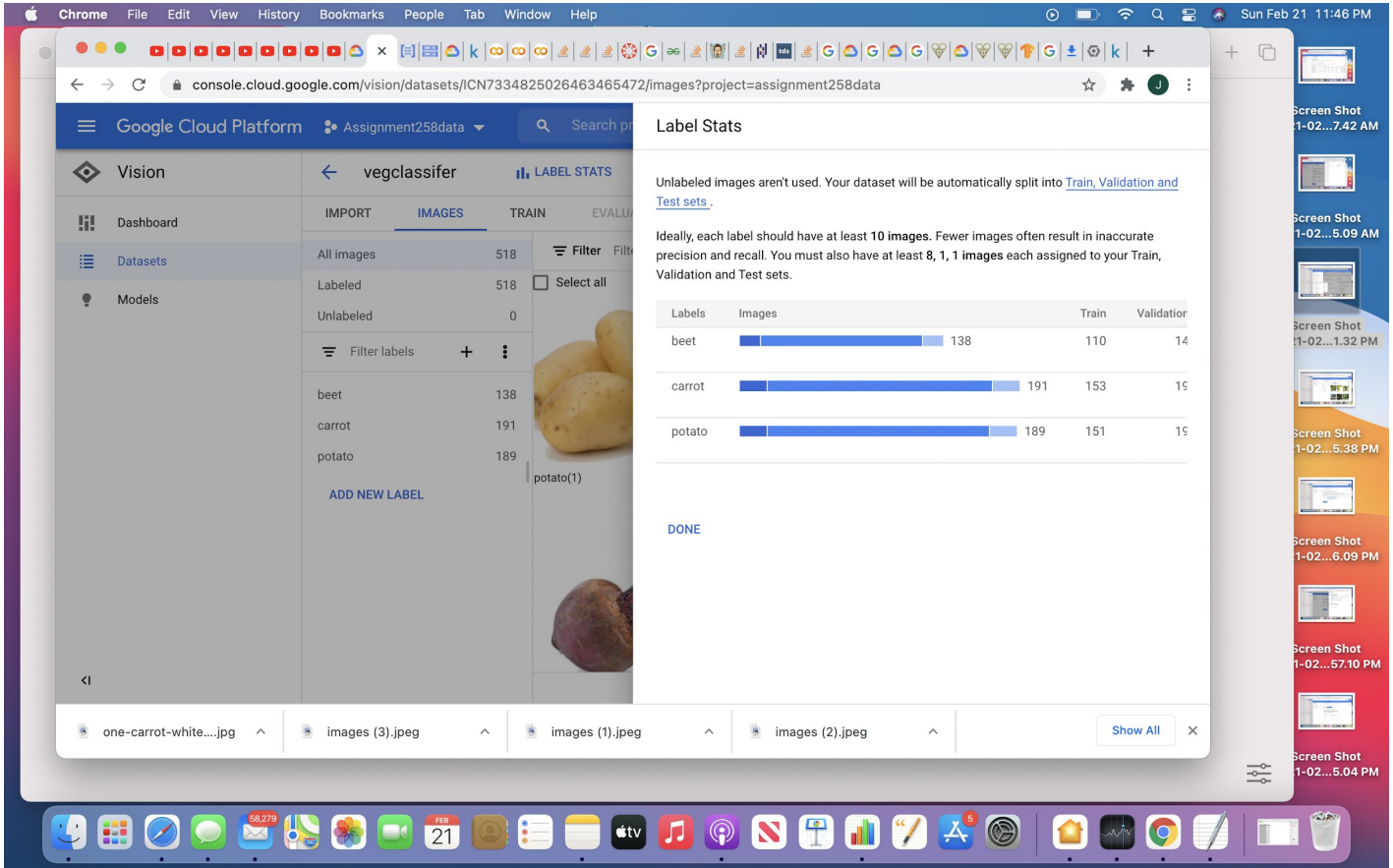
Part 1) d Custom Model using different datasets computer edge to get tensorflow lite model

This model classifier was build by downloading the images related to - carrot , potatoes , beetroot . The part of building custom model was used later by downloading the tensorflow lite version and using it in android application.

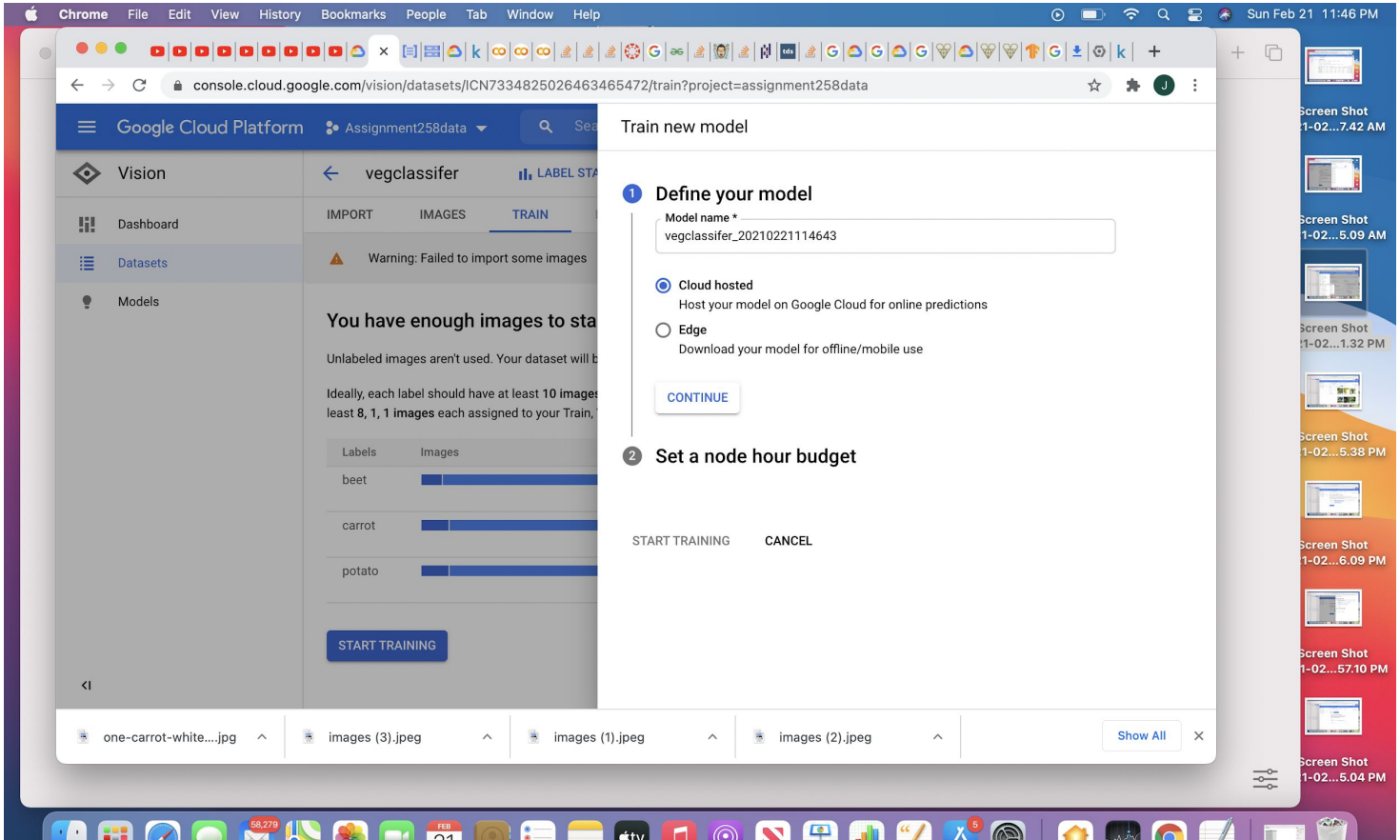
The classifier was trained and then deployed on android application .

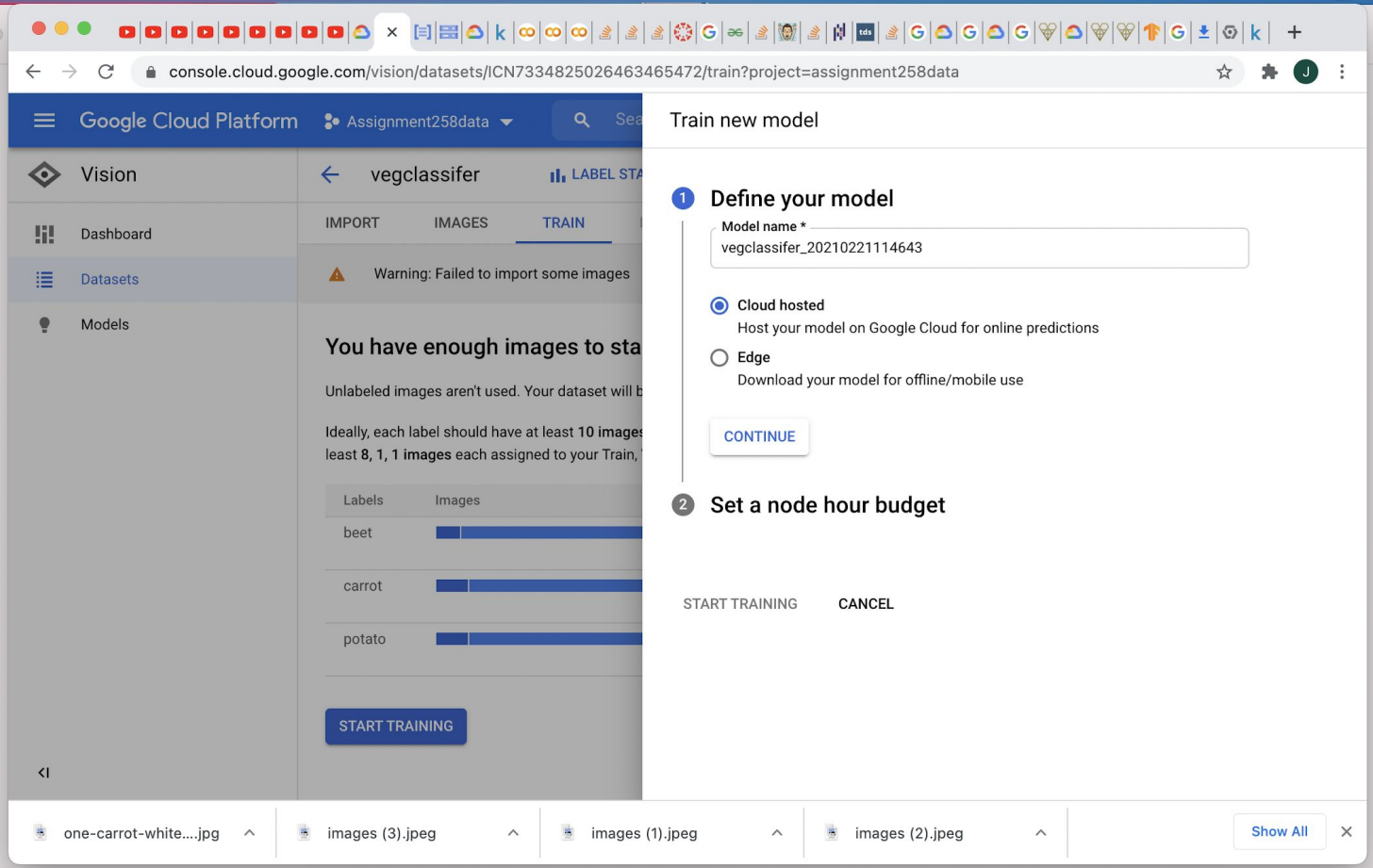
Veg classifer

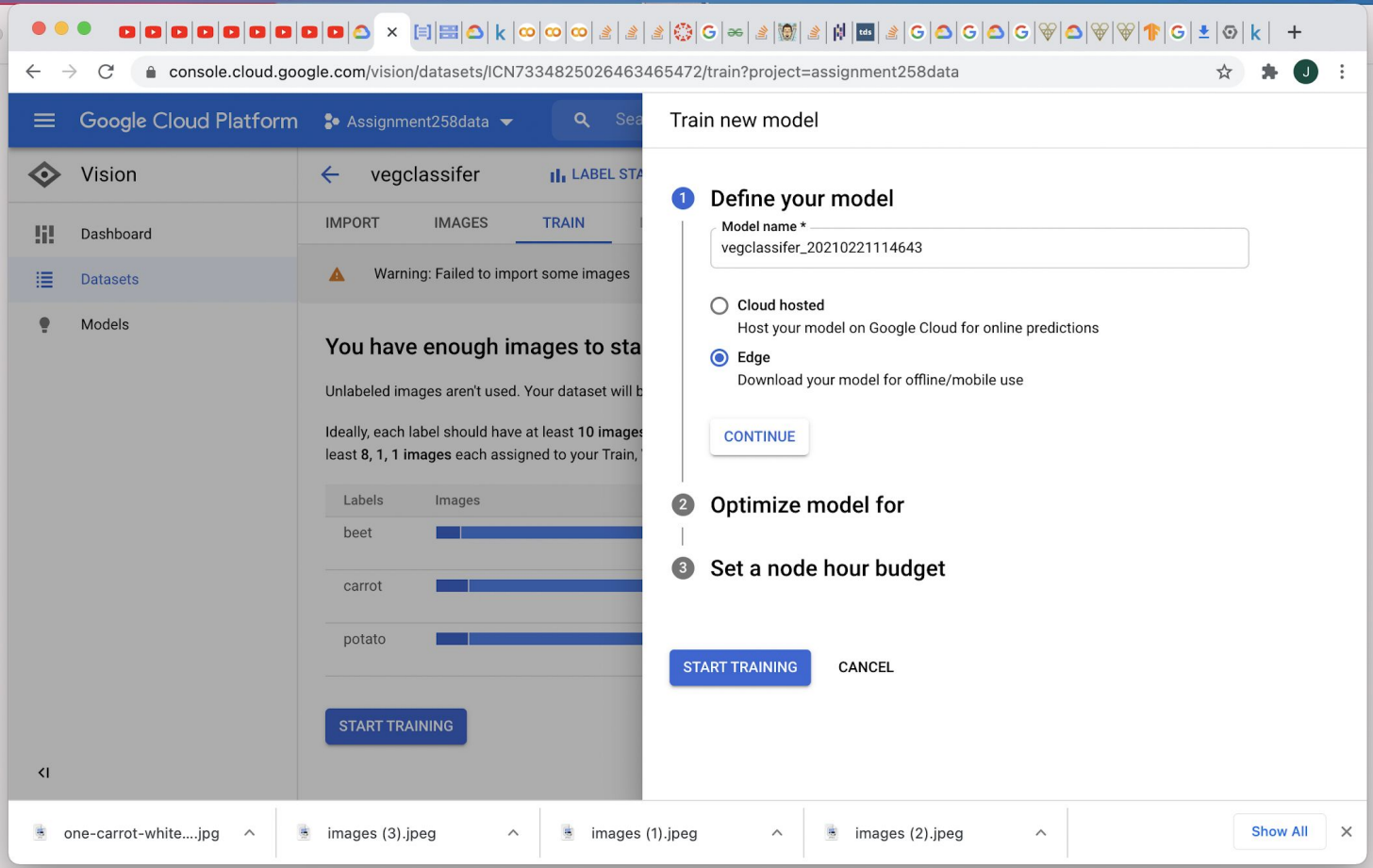


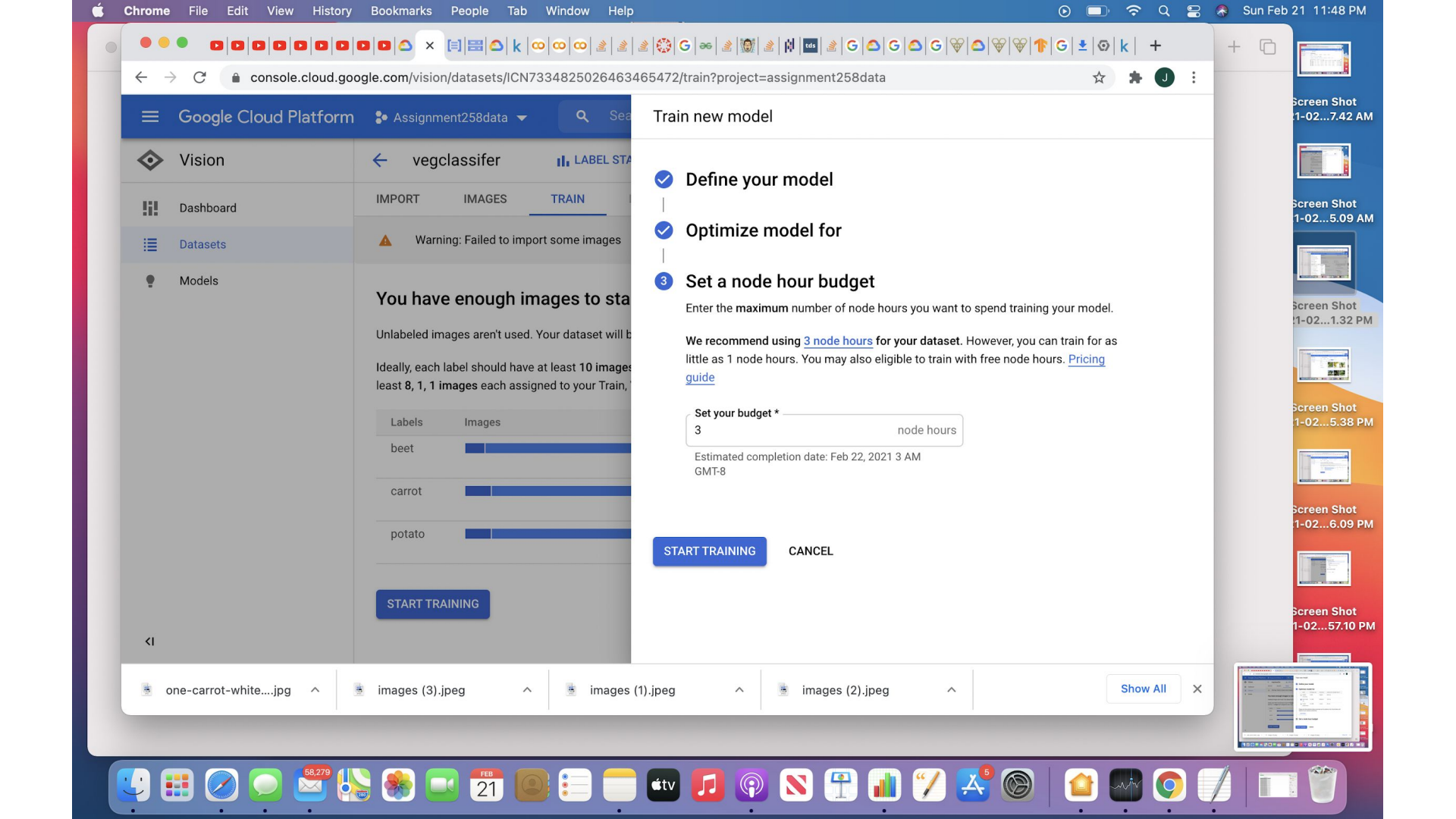

Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 11:46 PM
console.cloud.google.com/vision/datasets/ICN7334825026463465472/images?project=assignment258data
Google Cloud Platform
Assignment258data
Vision
Dashboard
Datasets
Models
vegclassifer
LABEL STATS
IMPORT
IMAGES
TRAIN
All images 518
Labeled 518
Unlabeled 0
Filter labels
beet 138
carrot 191
potato 189
ADD NEW LABEL
Select all
potato(1)
Label Stats
Unlabeled images aren't used. Your dataset will be automatically split into Train, Validation and Test sets.
Ideally, each label should have at least 10 images. Fewer images often result in inaccurate precision and recall. You must also have at least 8, 1, 1 images each assigned to your Train, Validation and Test sets.
Labels
Images
Train
Validation
beet 138 110
carrot 191 153
potato 189 151
DONE
one-carrot-white....jpg
images (3).jpeg
images (1).jpeg
images (2).jpeg
Show All
Screen Shot 21-02...7.42 AM
Screen Shot 21-02...5.09 AM
Screen Shot 21-02...1.32 PM
Screen Shot 21-02...5.38 PM
Screen Shot 21-02...6.09 PM
Screen Shot 21-02...57.10 PM
Screen Shot 21-02...5.04 PM

Model definition

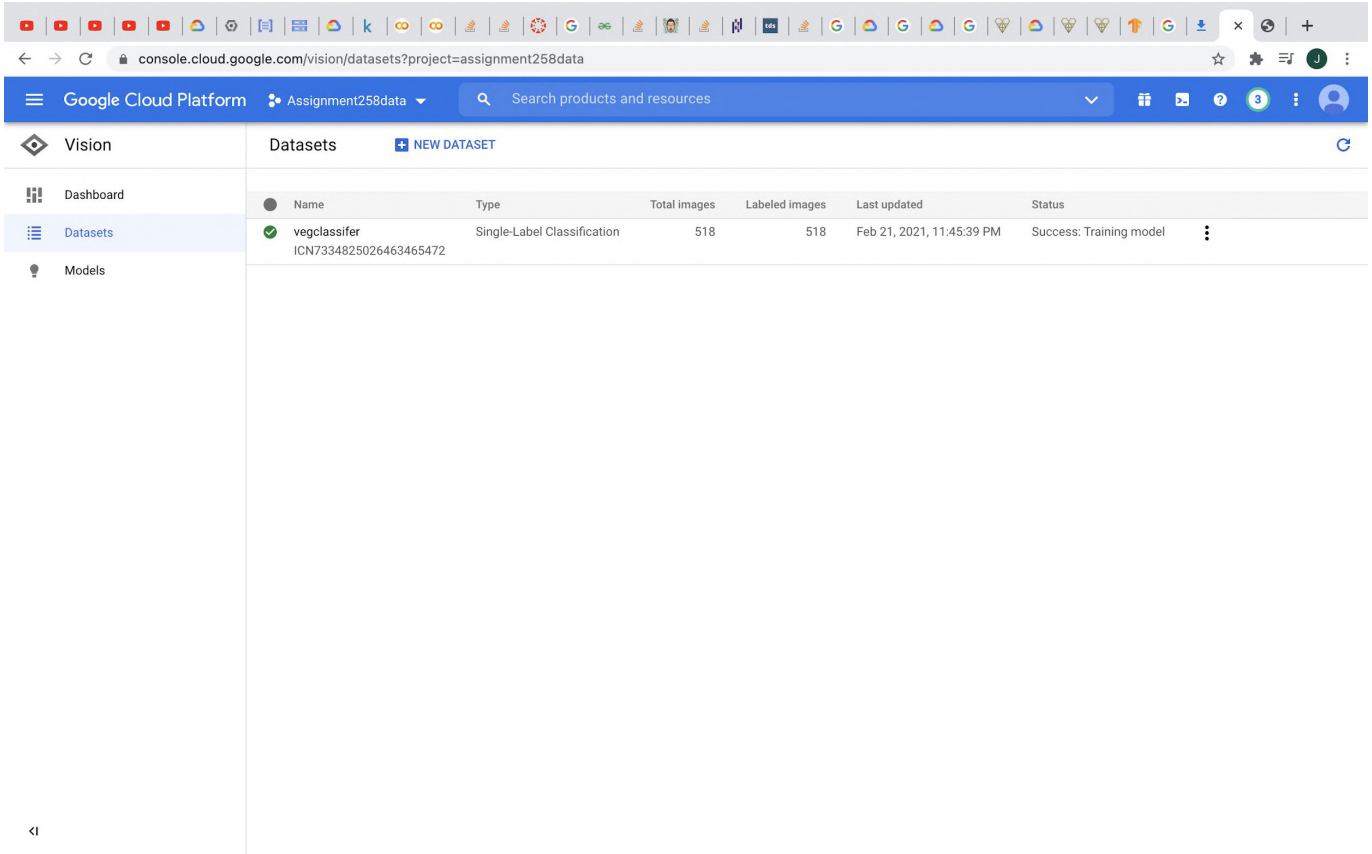


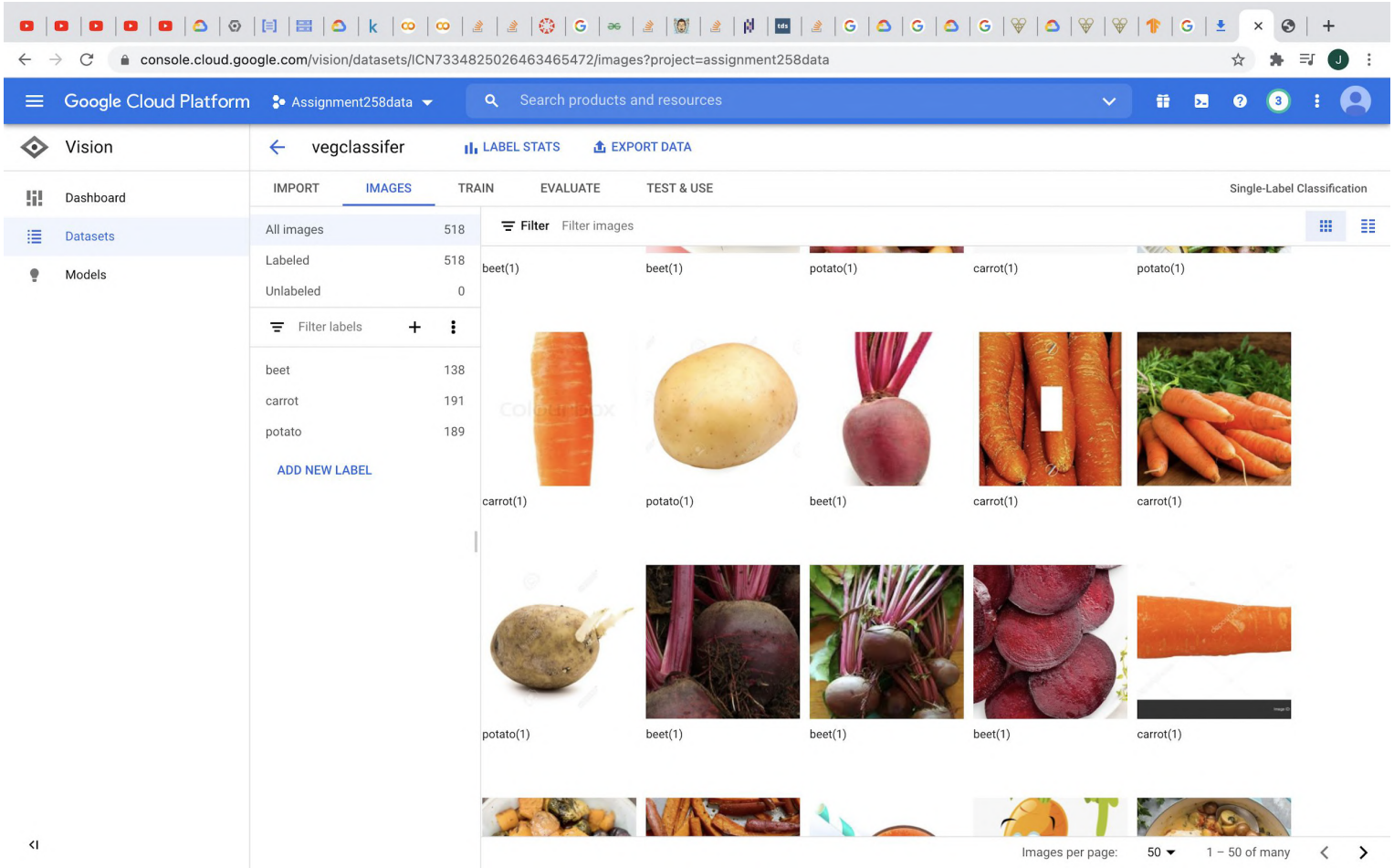

console.cloud.google.com/vision/datasets/ICN7334825026463465472/train?project=assignment258data
Google Cloud Platform
Assignment258data
Vision
Dashboard
Datasets
Models
vegclassifer
IMPORT
IMAGES
TRAIN
Warning: Failed to import some images
You have enough images to sta
Unlabeled images aren't used. Your dataset will b
Ideally, each label should have at least 10 images
least 8, 1, 1 images each assigned to your Train,
Labels
Images
beet
carrot
potato
START TRAINING
Train new model
1 Define your model
Model name *
vegclassifer_20210221114643
Cloud hosted
Host your model on Google Cloud for online predictions
Edge
Download your model for offline/mobile use
CONTINUE
2 Set a node hour budget
START TRAINING
CANCEL
one-carrot-white....jpg
images (3).jpeg
images (1).jpeg
images (2).jpeg
Show All


Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 11:47 PM
console.cloud.google.com/vision/datasets/ICN7334825026463465472/train?project=assignment258data
Google Cloud Platform
Assignment258data
Vision
vegclassifer
LABEL STA
IMPORT
IMAGES
TRAIN
Dashboard
Datasets
Models
Warning: Failed to import some images
You have enough images to sta
Unlabeled images aren't used. Your dataset will b
Ideally, each label should have at least 10 images
least 8, 1, 1 images each assigned to your Train,
Labels
Images
beet
carrot
potato
START TRAINING
Train new model
1 Define your model
Model name *
vegclassifer_20210221114643
Cloud hosted
Host your model on Google Cloud for online predictions
Edge
Download your model for offline/mobile use
CONTINUE
2 Optimize model for
3 Set a node hour budget
START TRAINING
CANCEL
one-carrot-white....jpg
images (3).jpeg
images (1).jpeg
images (2).jpeg
Show All
Screen Shot 21-02...7.42 AM
Screen Shot 21-02...5.09 AM
Screen Shot 21-02...1.32 PM
Screen Shot 21-02...5.38 PM
Screen Shot 21-02...6.09 PM
Screen Shot 21-02...57.10 PM
Screen Shot 21-02...5.04 PM

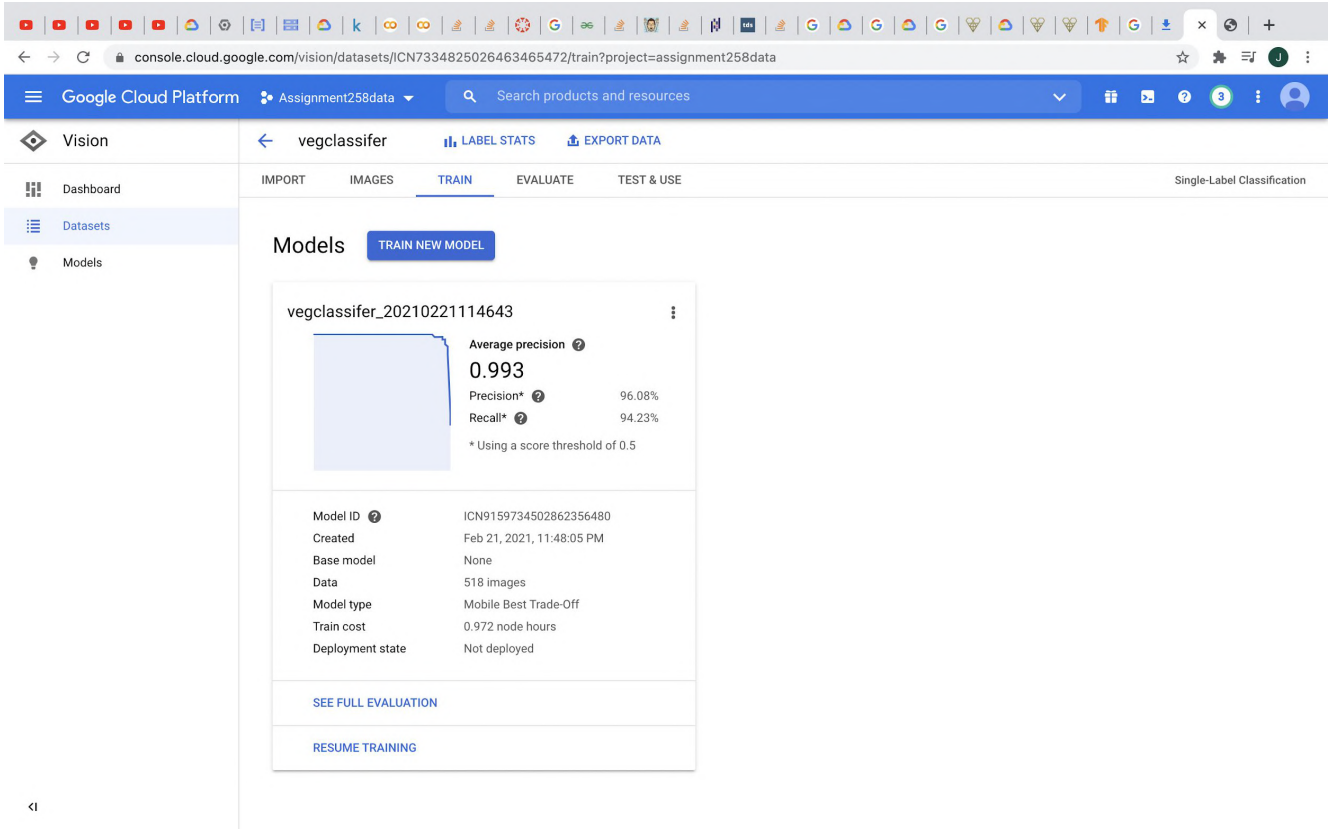

Chrome File Edit View History Bookmarks People Tab Window Help
Sun Feb 21 11:48 PM
console.cloud.google.com/vision/datasets/ICN7334825026463465472/train?project=assignment258data
Google Cloud Platform
Assignment258data
Vision
Dashboard
Datasets
Models
vegclassifer
IMPORT
IMAGES
TRAIN
Warning: Failed to import some images
You have enough images to sta
Unlabeled images aren't used. Your dataset will b
Ideally, each label should have at least 10 images
least 8, 1, 1 images each assigned to your Train,
Labels
Images
beet
carrot
potato
START TRAINING
Train new model
Define your model
Optimize model for
3
Set a node hour budget
Enter the maximum number of node hours you want to spend training your model.
We recommend using 3 node hours for your dataset. However, you can train for as little as 1 node hours. You may also eligible to train with free node hours. Pricing guide
Set your budget *
3
node hours
Estimated completion date: Feb 22, 2021 3 AM
GMT-8
START TRAINING
CANCEL
one-carrot-white....jpg
images (3).jpeg
images (1).jpeg
images (2).jpeg
Show All
Screen Shot 21-02...7.42 AM
Screen Shot 21-02...5.09 AM
Screen Shot 21-02...1.32 PM
Screen Shot 21-02...5.38 PM
Screen Shot 21-02...6.09 PM
Screen Shot 21-02...57.10 PM

Classifier trained successfully




console.cloud.google.com/vision/datasets/ICN7334825026463465472/images?project=assignment258data
Google Cloud Platform
Assignment258data
Search products and resources
Vision
Dashboard
Datasets
Models
vegclassifer
LABEL STATS
EXPORT DATA
IMPORT
IMAGES
TRAIN
EVALUATE
TEST & USE
Single-Label Classification
All images 518
Labeled 518
Unlabeled 0
Filter labels
beet 138
carrot 191
potato 189
ADD NEW LABEL
Filter
Filter images
beet(1)
beet(1)
potato(1)
carrot(1)
potato(1)
carrot(1)
potato(1)
beet(1)
carrot(1)
carrot(1)
potato(1)
beet(1)
beet(1)
beet(1)
carrot(1)
Images per page:
50
1 – 50 of many

Model evaluation



console.cloud.google.com/vision/datasets/ICN7334825026463465472;modelId=ICN9159734502862356480/evaluate?project=assignment258data

Google Cloud Platform | Assignment258data | Search products and resources

console.cloud.google.com/vision/datasets/ICN7334825026463465472;modelId=ICN9159734502862356480/evaluate?project=assignment258data

Google Cloud Platform | Assignment258data | Search products and resources

Vision

- Dashboard
- Datasets
- Models

vegclassifer | LABEL STATS | EXPORT DATA

IMPORT | IMAGES | TRAIN | EVALUATE | TEST & USE

Single-Label Classification

Model: vegclassifer_20210221114643

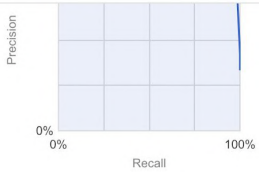
Confidence threshold: 0.5

Filter labels

All labels	0.99259
beet	1
carrot	0.99282
potato	1

Test items	52
Precision	96.08%
Recall	94.23%

Use the slider to see which confidence threshold works best for your model on the precision-recall tradeoff curve.
Learn more about these metrics and graphs.



Confusion matrix

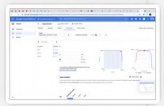
Item counts

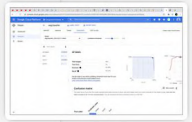
This table shows how often the model classified each label correctly (in blue), and which labels were most often confused for that label (in gray). **Note that this table is limited to the 10 most confused labels.** You can download the entire confusion matrix as a CSV file.

True Label \ Predicted Label	potato	carrot	beet
potato	100%	-	-
carrot	-	89%	11%
beet	-	-	100%

em counts

lote that this





Vision

Dashboard

Datasets

Models

vegclassifer LABEL STATS EXPORT DATA

IMPORT IMAGES TRAIN EVALUATE TEST & USE Single-Label Classification

Model
vegclassifer_20210221114643

To use online prediction, deploy your model to the cloud. Deployed model charges are per hour and number of machines used. Pricing guide DEPLOY MODEL

Notice for beta users: The v1beta1 API endpoint is scheduled for deletion after GA release. If your beta models have not been redeployed since October 17, 2019, please do so now to avoid interruption when the old service is shut down.

Use your model

TF Lite

Export your model as a TF Lite package to run your model on edge or mobile devices.

TensorFlow.js

Export your model as a TensorFlow.js package to run your model in the browser and in Node.js.

Core ML

Export a .mlmodel file to run your model on iOS and macOS devices.

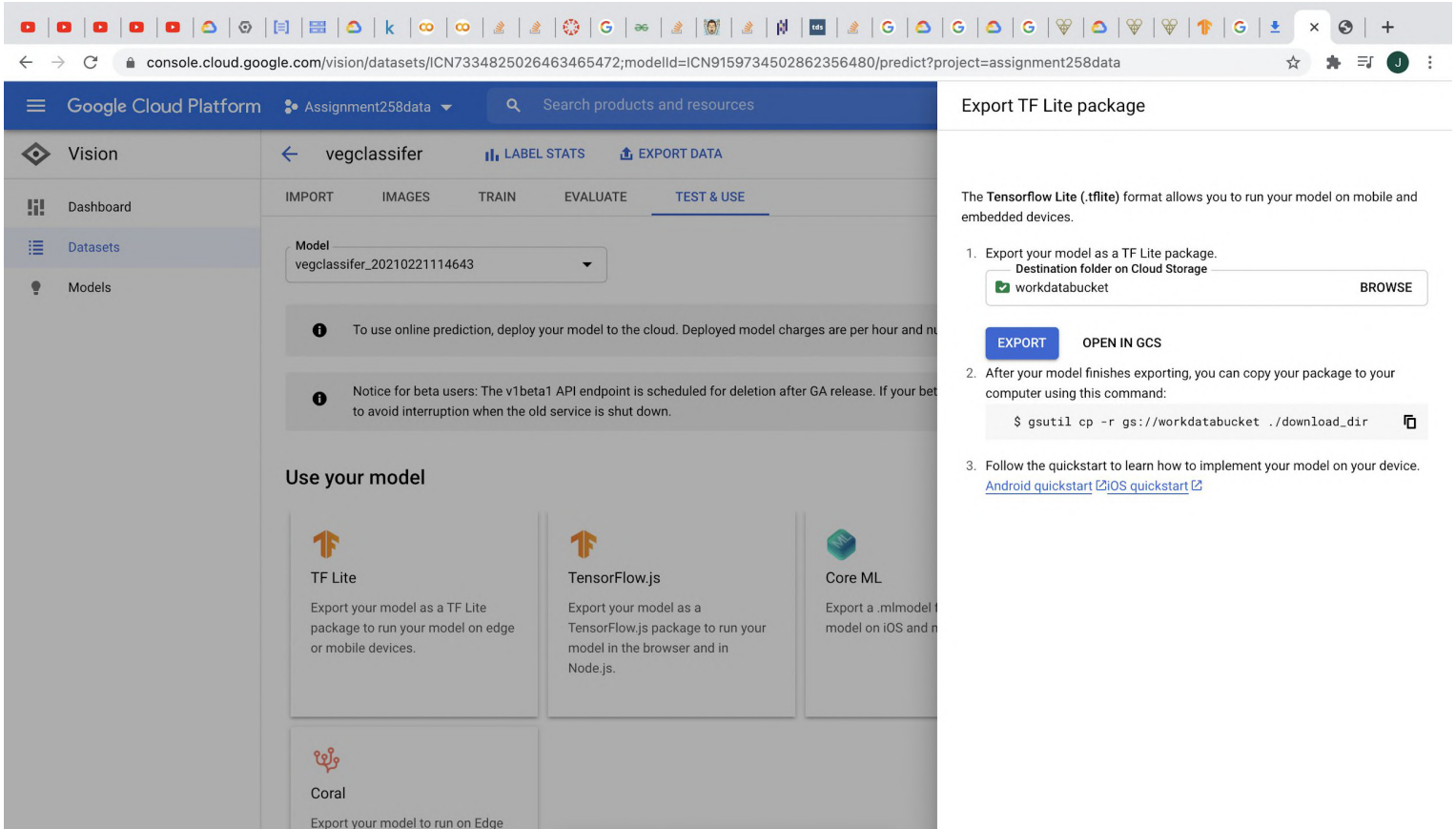
Container

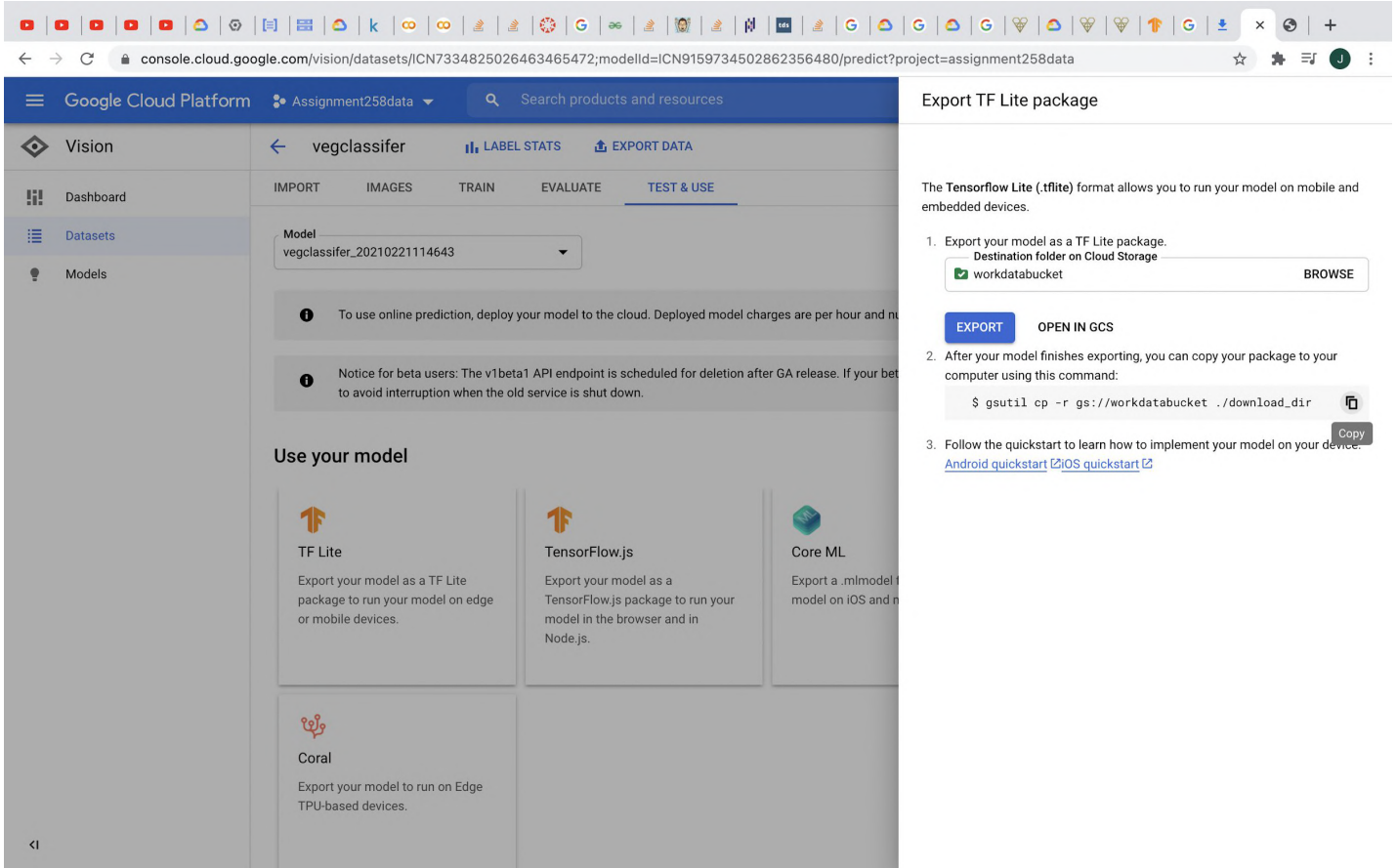
Export your model as a TF Saved Model to run on a Docker container.

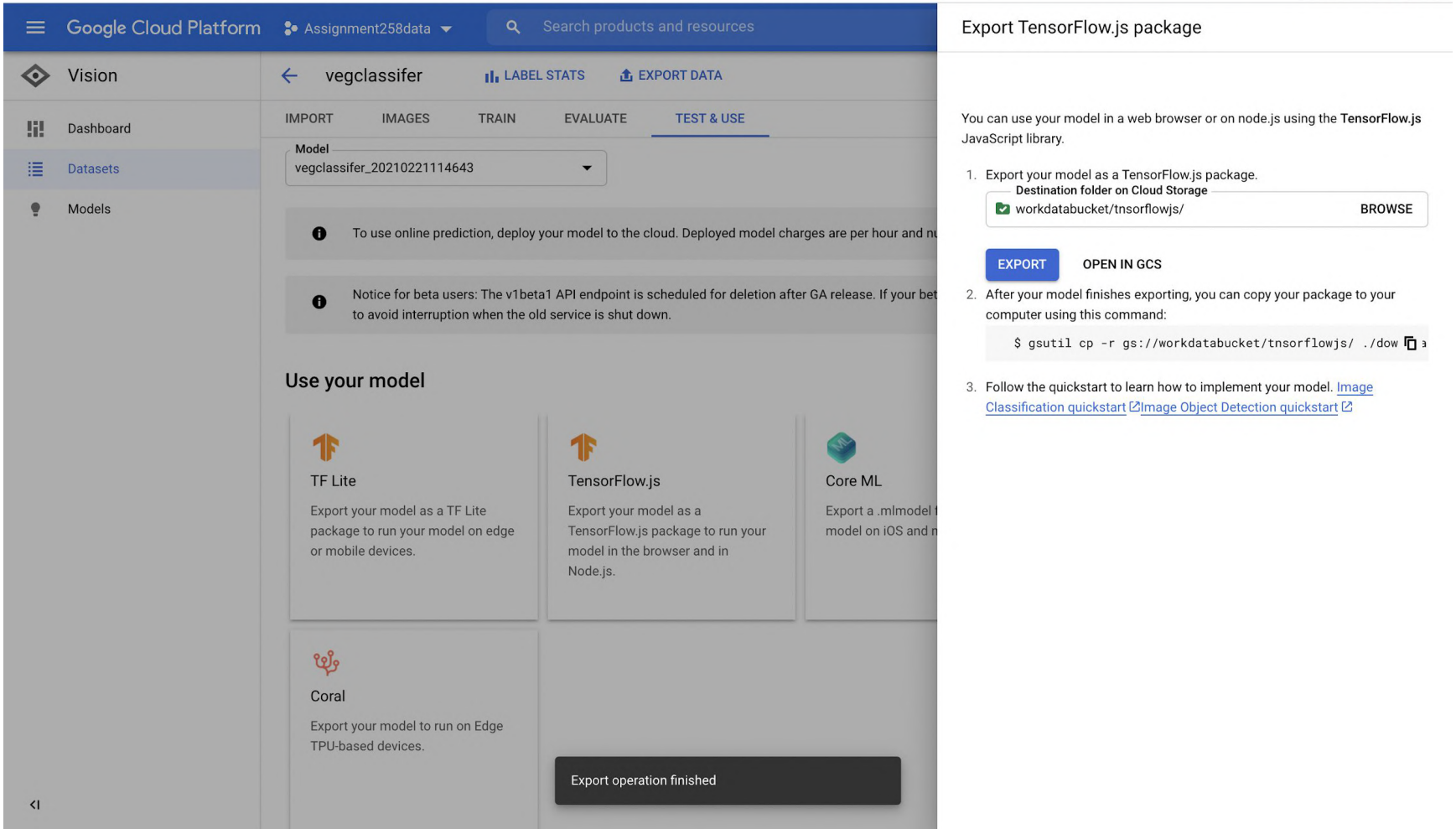
Coral

Export your model to run on Edge TPU-based devices.

Stored the tensorflow lite model in bucket




console.cloud.google.com/vision/datasets/ICN7334825026463465472;modelId=ICN9159734502862356480/predict?project=assignment258data
Google Cloud Platform
Assignment258data
Search products and resources
Vision
Dashboard
Datasets
Models
vegclassifer
LABEL STATS
EXPORT DATA
IMPORT
IMAGES
TRAIN
EVALUATE
TEST & USE
Model
vegclassifer_20210221114643
To use online prediction, deploy your model to the cloud. Deployed model charges are per hour and nu
Notice for beta users: The v1beta1 API endpoint is scheduled for deletion after GA release. If your bet
to avoid interruption when the old service is shut down.
Use your model
TF Lite
Export your model as a TF Lite package to run your model on edge or mobile devices.
TensorFlow.js
Export your model as a TensorFlow.js package to run your model in the browser and in Node.js.
Core ML
Export a .mlmodel
model on iOS and
Coral
Export your model to run on Edge TPU-based devices.
Export TF Lite package
The Tensorflow Lite (.tflite) format allows you to run your model on mobile and embedded devices.
1. Export your model as a TF Lite package.
Destination folder on Cloud Storage
workdatabucket
BROWSE
EXPORT
OPEN IN GCS
2. After your model finishes exporting, you can copy your package to your computer using this command:
$ gsutil cp -r gs://workdatabucket ./download_dir
Copy
3. Follow the quickstart to learn how to implement your model on your device.
Android quickstart
iOS quickstart


console.cloud.google.com/vision/datasets/ICN7334825026463465472;modelId=ICN9159734502862356480/predict?project=assignment258data
Google Cloud Platform
Assignment258data
Search products and resources
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LABEL STATS
EXPORT DATA
IMPORT
IMAGES
TRAIN
EVALUATE
TEST & USE
Model
vegclassifer_20210221114643
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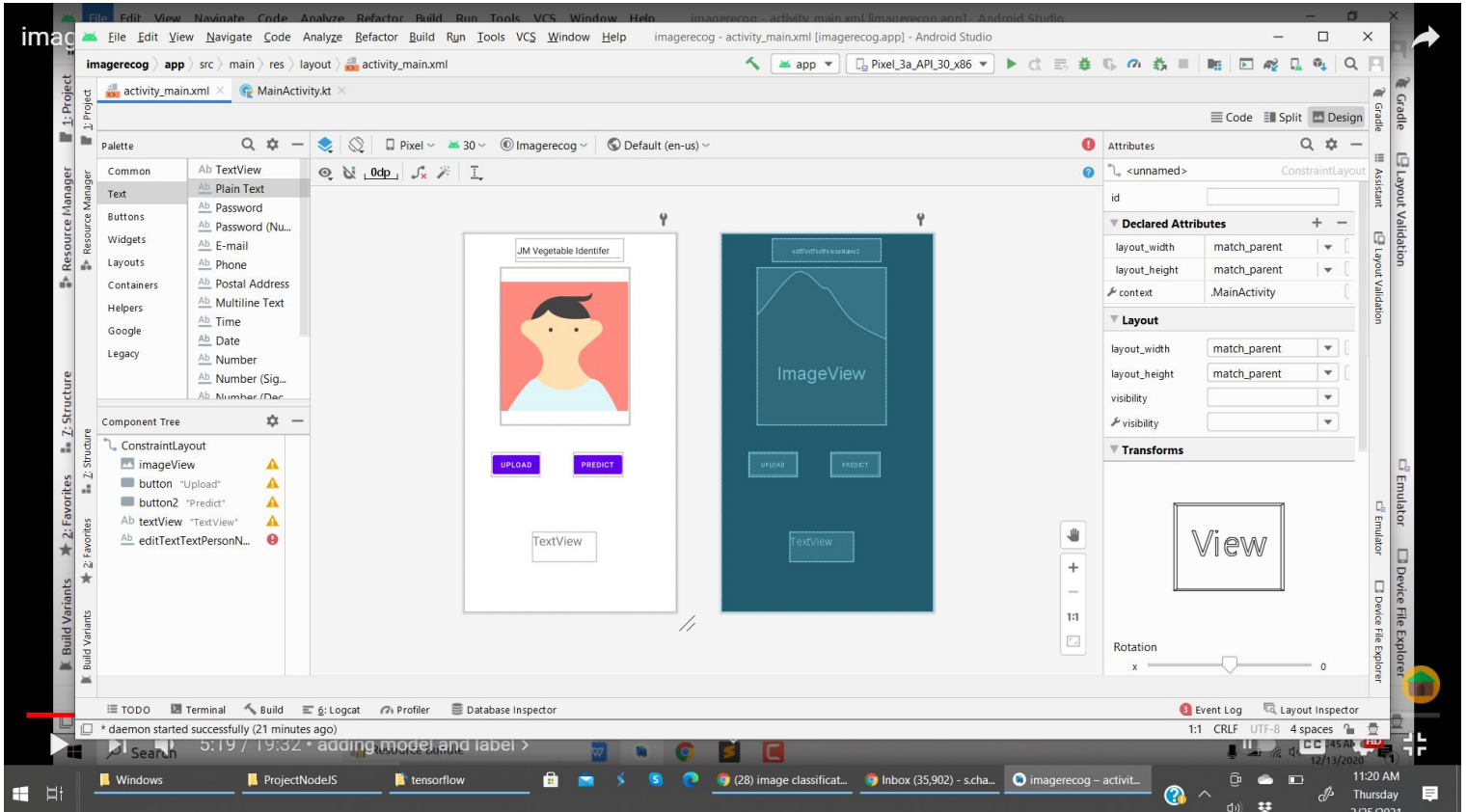
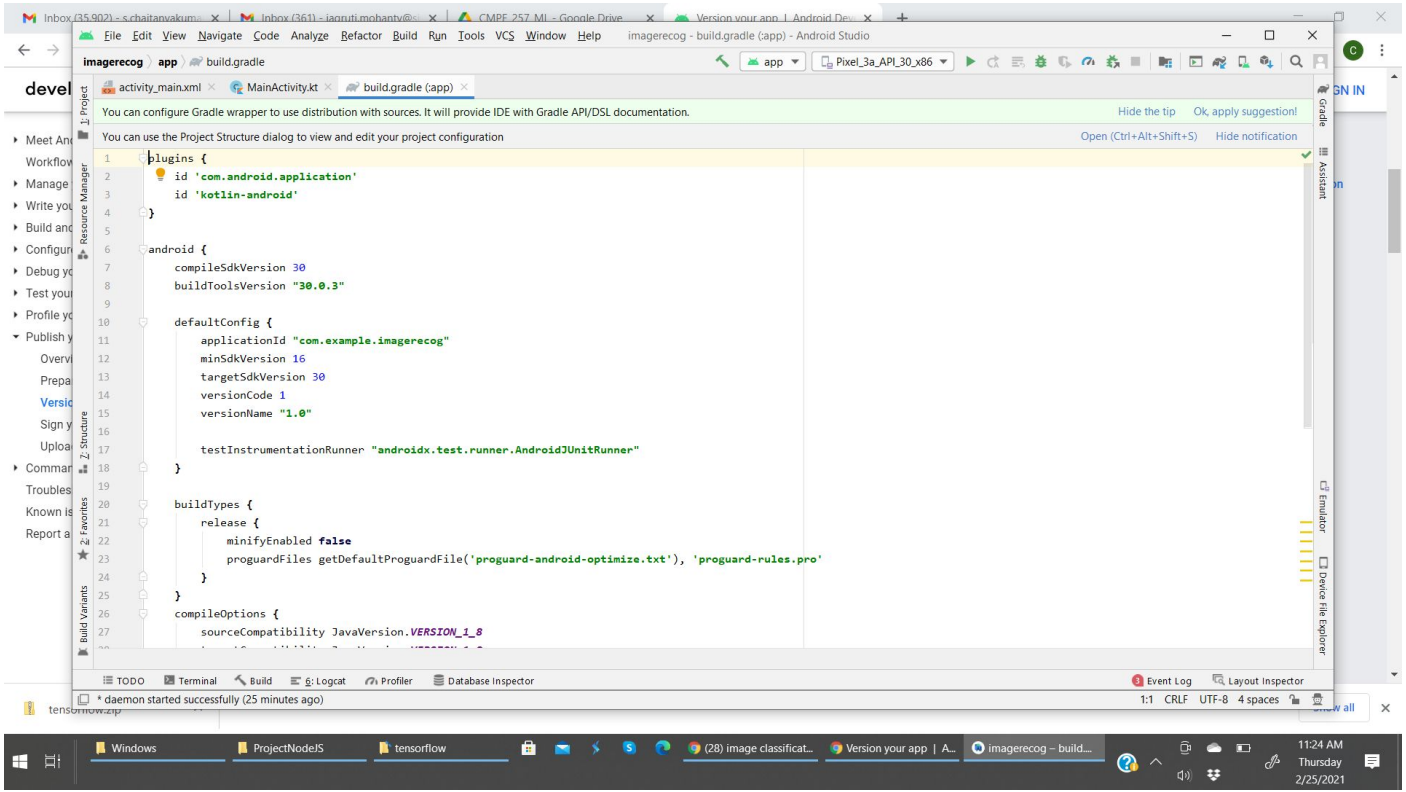
Use your model
TF Lite
Export your model as a TF Lite package to run your model on edge or mobile devices.
TensorFlow.js
Export your model as a TensorFlow.js package to run your model in the browser and in Node.js.
Core ML
Export a .mlmodel f
model on iOS and n
Coral
Export your model to run on Edge TPU-based devices.
Export operation finished
Export TensorFlow.js package
You can use your model in a web browser or on node.js using the TensorFlow.js JavaScript library.
1. Export your model as a TensorFlow.js package.
Destination folder on Cloud Storage
workdatabucket/tnsorflowjs/
BROWSE
EXPORT
OPEN IN GCS
2. After your model finishes exporting, you can copy your package to your computer using this command:
$ gsutil cp -r gs://workdatabucket/tnsorflowjs/ ./dow
3. Follow the quickstart to learn how to implement your model. Image Classification quickstart Image Object Detection quickstart

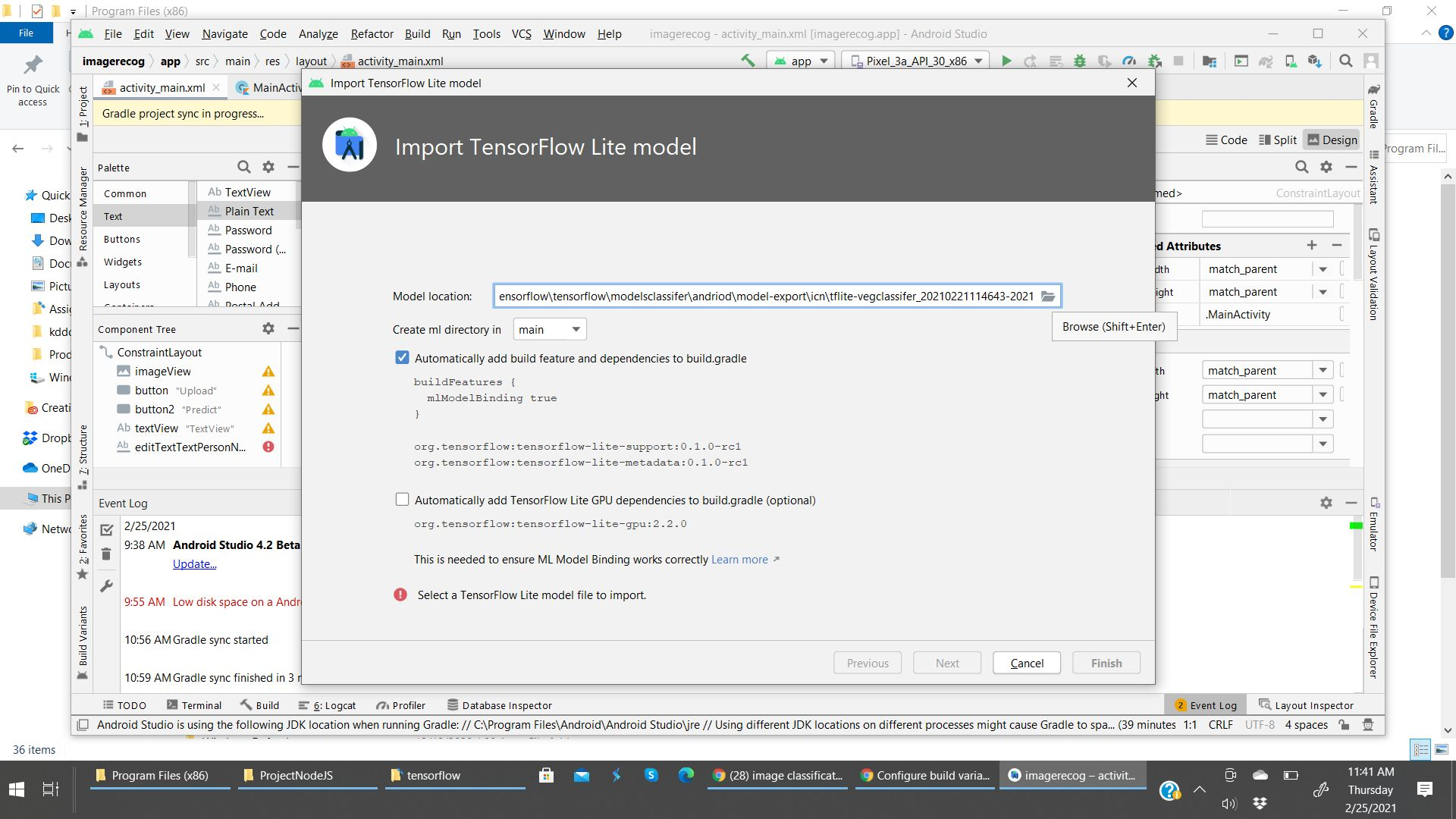
Part 2）Android Part deployement

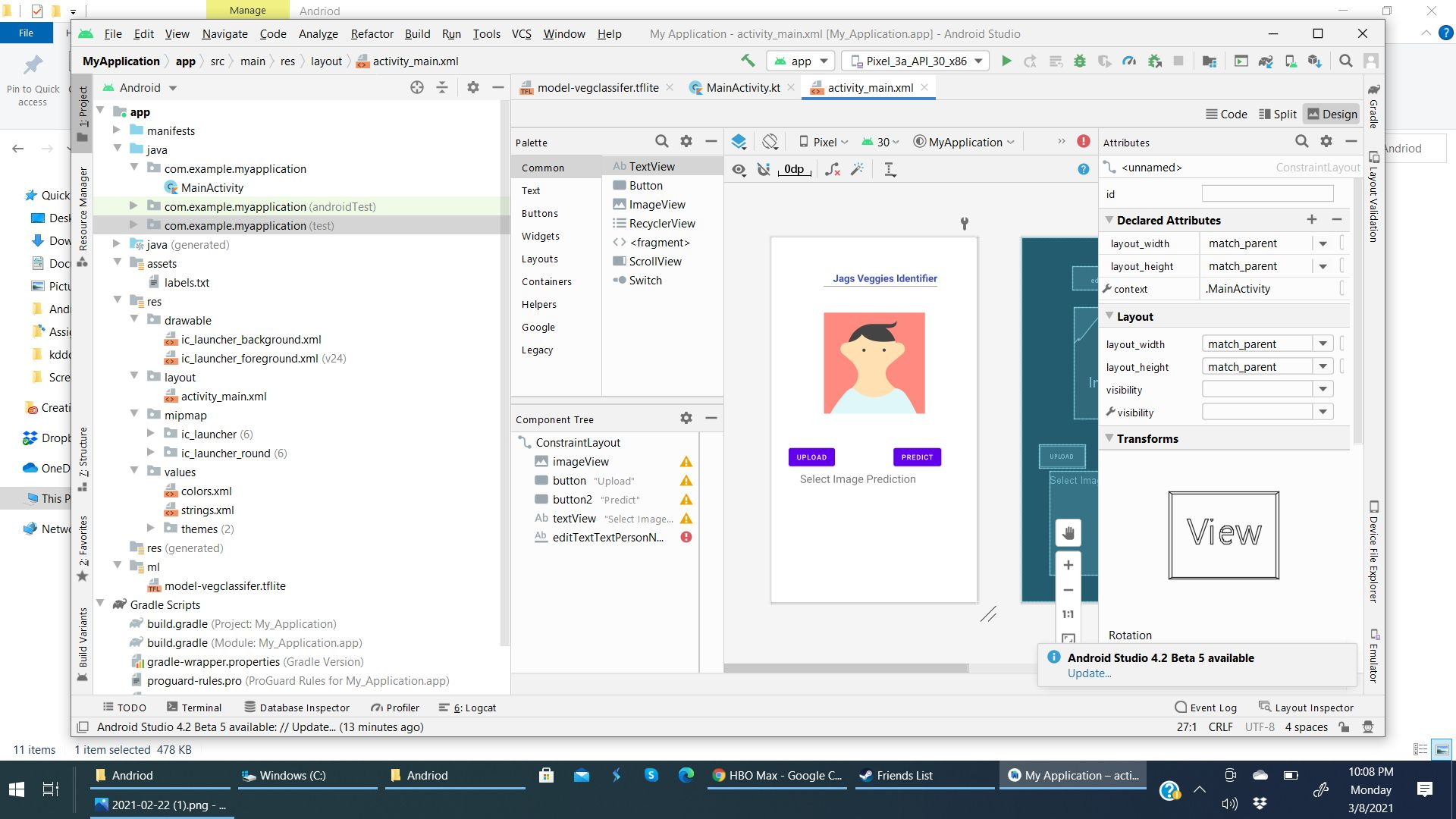
This is to build the ui part

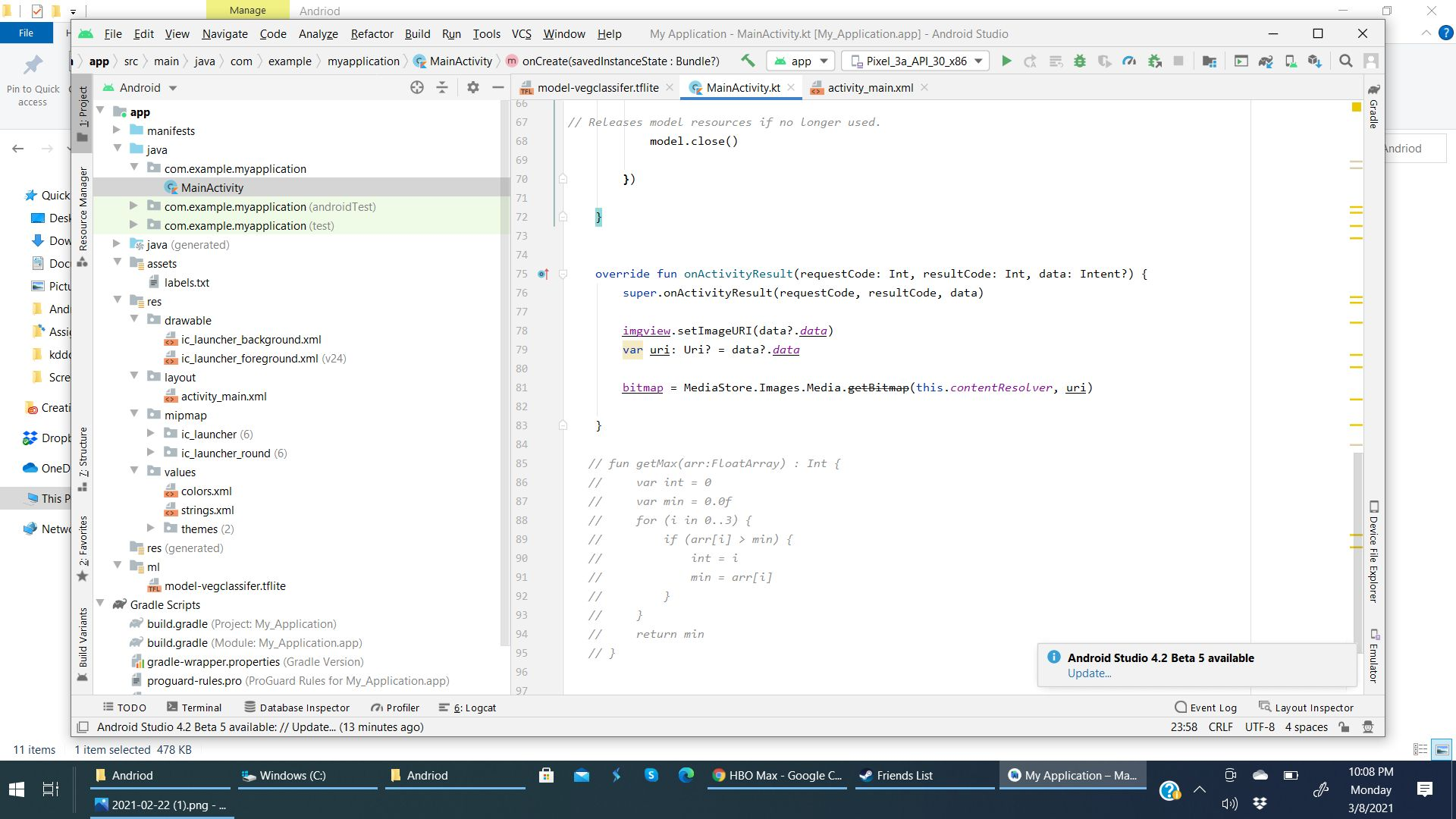


This is to add the code and integrate the model with tensorflow lite model




Import TensorFlow Lite model
Import TensorFlow Lite model
Model location:
ensorflow\tensorflow\modelsclassifer\andriod\model-export\icn\tflite-vegclassifer_20210221114643-2021
Browse (Shift+Enter)
Create ml directory in
main
Automatically add build feature and dependencies to build.gradle
buildFeatures {
mlModelBinding true
}
org.tensorflow:tensorflow-lite-support:0.1.0-rc1
org.tensorflow:tensorflow-lite-metadata:0.1.0-rc1
Automatically add TensorFlow Lite GPU dependencies to build.gradle (optional)
org.tensorflow:tensorflow-lite-gpu:2.2.0
This is needed to ensure ML Model Binding works correctly Learn more
Select a TensorFlow Lite model file to import.
Previous
Next
Cancel
Finish


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - activity_main.xml [My_Application.app] - Android Studio
MyApplication app src main res layout activity_main.xml
app
Pixel_3a_API_30_x86
Android
app
manifests
java
com.example.myapplication
MainActivity
com.example.myapplication (androidTest)
com.example.myapplication (test)
java (generated)
assets
labels.txt
res
drawable
ic_launcher_background.xml
ic_launcher_foreground.xml (v24)
layout
activity_main.xml
mipmap
ic_launcher (6)
ic_launcher_round (6)
values
colors.xml
strings.xml
themes (2)
res (generated)
ml
model-vegclassifer.tflite
Gradle Scripts
build.gradle (Project: My_Application)
build.gradle (Module: My_Application.app)
gradle-wrapper.properties (Gradle Version)
proguard-rules.pro (ProGuard Rules for My_Application.app)
model-vegclassifer.tflite
MainActivity.kt
activity_main.xml
Code
Split
Design
Palette
Common
Text
Buttons
Widgets
Layouts
Containers
Helpers
Google
Legacy
TextView
Button
ImageView
RecyclerView
<fragment>
ScrollView
Switch
Component Tree
ConstraintLayout
imageView
button "Upload"
button2 "Predict"
textView "Select Image...
editTextTextPersonN...
Pixel
30
MyApplication
0dp
Jags Veggies Identifier
UPLOAD
PREDICT
Select Image Prediction
Attributes
<unnamed>
ConstraintLayout
id
Declared Attributes
layout_width
match_parent
layout_height
match_parent
context
.MainActivity
Layout
layout_width
match_parent
layout_height
match_parent
visibility
visibility
Transforms
View
Rotation
Android Studio 4.2 Beta 5 available
Update...
TODO
Terminal
Database Inspector
Profiler
6: Logcat
Event Log
Layout Inspector
Android Studio 4.2 Beta 5 available: // Update... (13 minutes ago)
27:1
CRLF
UTF-8
4 spaces
11 items
1 item selected 478 KB
Andriod
Windows (C:)
Andriod
HBO Max - Google C...
Friends List
My Application – acti...
2021-02-22 (1).png - ...
10:08 PM
Monday
3/8/2021


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - MainActivity.kt [My_Application.app] - Android Studio
app src main java com example myapplication MainActivity onCreate(savedInstanceState : Bundle?)
Pixel_3a_API_30_x86
Android
app
manifests
java
com.example.myapplication
MainActivity
com.example.myapplication (androidTest)
com.example.myapplication (test)
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assets
labels.txt
res
drawable
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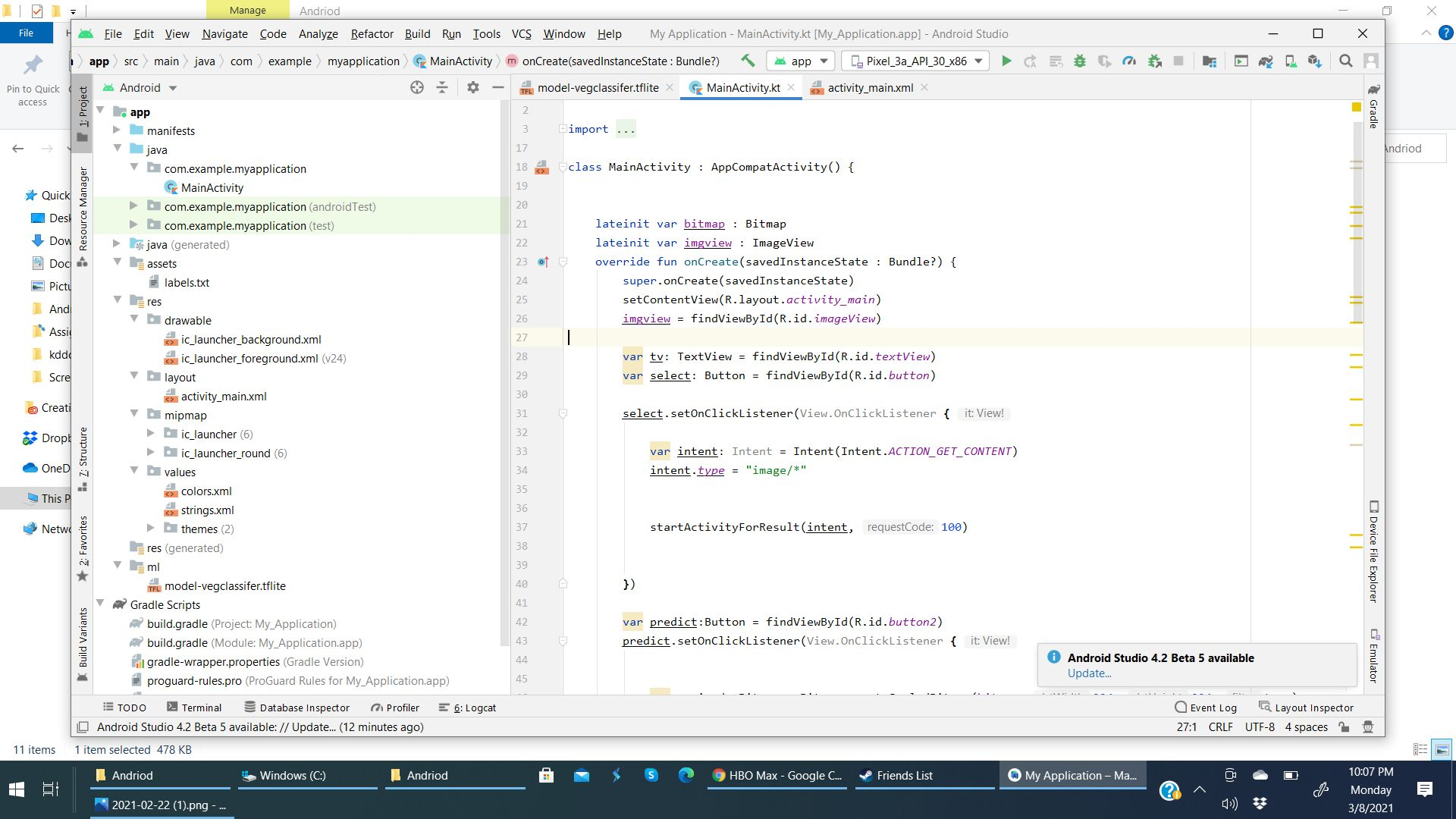
model-vegclassifer.tflite
MainActivity.kt
activity_main.xml
// Releases model resources if no longer used.
model.close()
})
}
override fun onActivityResult(requestCode: Int, resultCode: Int, data: Intent?) {
super.onActivityResult(requestCode, resultCode, data)
imgview.setImageURI(data?.data)
var uri: Uri? = data?.data
bitmap = MediaStore.Images.Media.getBitmap(this.contentResolver, uri)
}
// fun getMax(arr:FloatArray) : Int {
// var int = 0
// var min = 0.0f
// for (i in 0..3) {
// if (arr[i] > min) {
// int = i
// min = arr[i]
// }
// }
// return min
// }
Android Studio 4.2 Beta 5 available
Update...
TODO
Terminal
Database Inspector
Profiler
6: Logcat
Event Log
Layout Inspector
Android Studio 4.2 Beta 5 available: // Update... (13 minutes ago)
23:58 CRLF UTF-8 4 spaces
11 items
1 item selected 478 KB
Andriod
Windows (C:)
Andriod
HBO Max - Google C...
Friends List
My Application – Ma...
2021-02-22 (1).png - ...
10:08 PM
Monday
3/8/2021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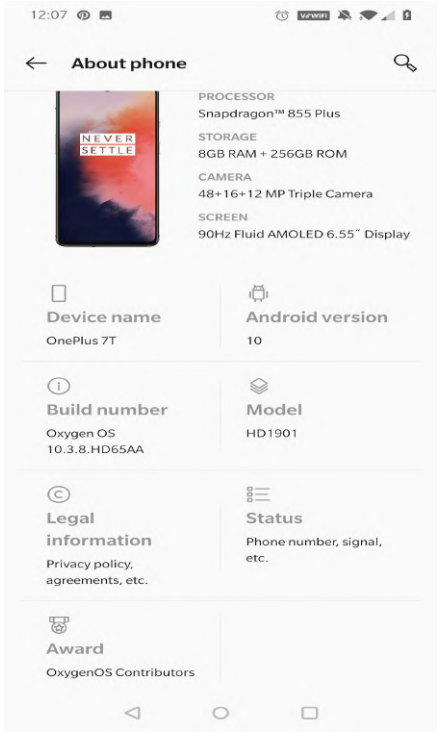
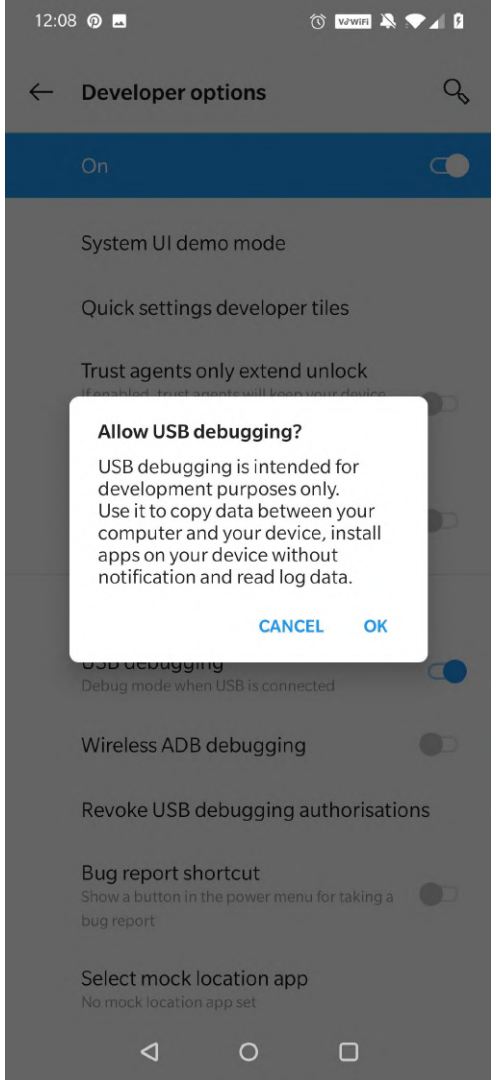
gradle-wrapper.properties (Gradle Version)
proguard-rules.pro (ProGuard Rules for My_Application.app)
model-vegclassifer.tflite
MainActivity.kt
activity_main.xml
import ...
class MainActivity : AppCompatActivity() {
lateinit var bitmap : Bitmap
lateinit var imgview : ImageView
override fun onCreate(savedInstanceState : Bundle?) {
super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
imgview = findViewById(R.id.imageView)
var tv: TextView = findViewById(R.id.textView)
var select: Button = findViewById(R.id.button)
select.setOnClickListener(View.OnClickListener { it: View!
var intent: Intent = Intent(Intent.ACTION_GET_CONTENT)
intent.type = "image/*"
startActivityForResult(intent, requestCode: 100)
})
var predict:Button = findViewById(R.id.button2)
predict.setOnClickListener(View.OnClickListener { it: View!
Android Studio 4.2 Beta 5 available
Update...
TODO
Terminal
Database Inspector
Profiler
6: Logcat
Event Log
Layout Inspector
Android Studio 4.2 Beta 5 available: // Update... (12 minutes ago)
27:1 CRLF UTF-8 4 spaces
11 items
1 item selected 478 KB
Andriod
Windows (C:)
Andriod
HBO Max - Google C...
Friends List
My Application – Ma...
2021-02-22 (1).png - ...
10:07 PM
Monday
3/8/2021

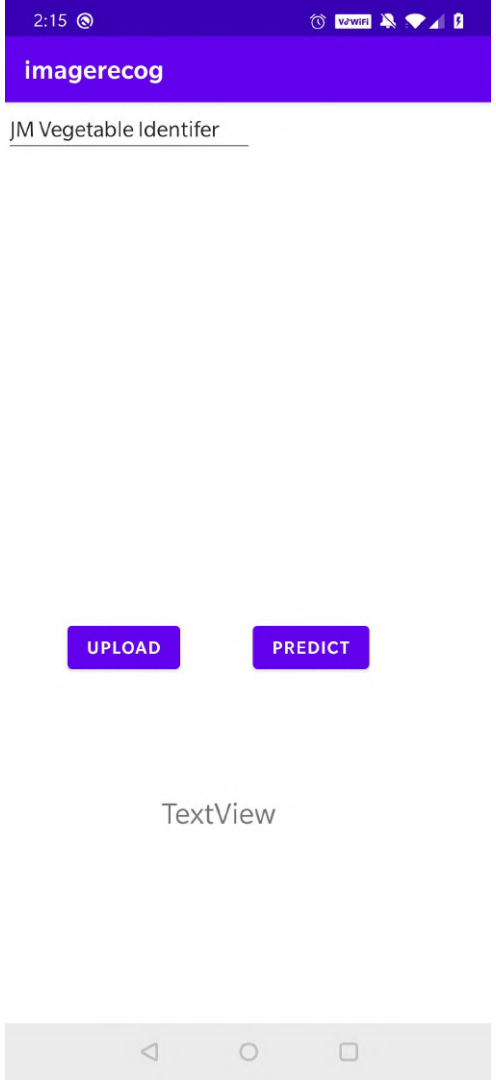
Output on android phone

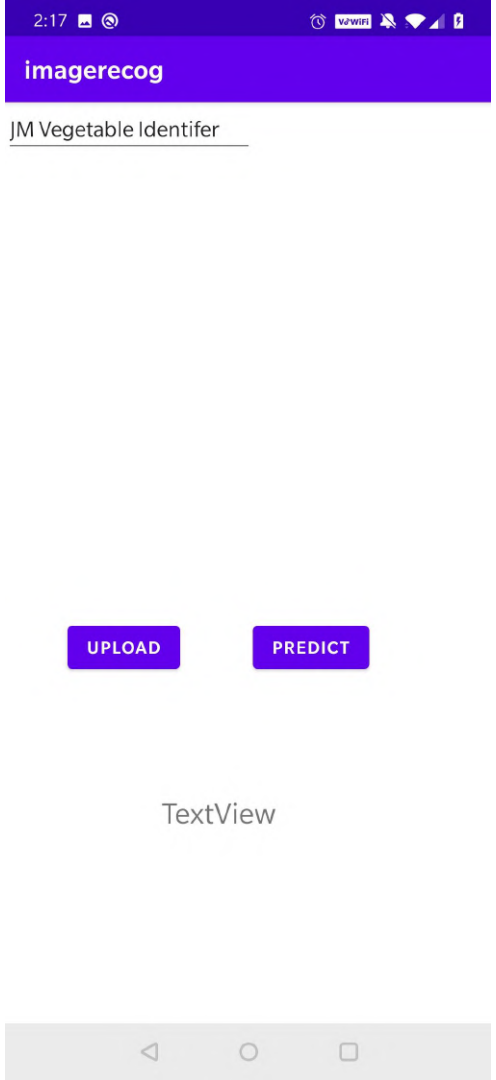
Vegetable classifier

My phone used for android application testing




12:08
Developer options
On
System UI demo mode
Quick settings developer tiles
Trust agents only extend unlock
Allow USB debugging?
USB debugging is intended for development purposes only. Use it to copy data between your computer and your device, install apps on your device without notification and read log data.
CANCEL
OK
Debug mode when USB is connected
Wireless ADB debugging
Revoke USB debugging authorisations
Bug report shortcut
Show a button in the power menu for taking a bug report
Select mock location app
No mock location app set


2:15
imagerecog
JM Vegetable Identifer
UPLOAD
PREDICT
TextView


2:17
imagerecog
JM Vegetable Identifer
UPLOAD
PREDICT
TextView

6:42

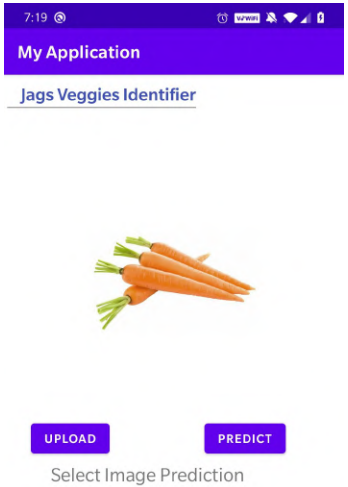
My Application

UPLOAD

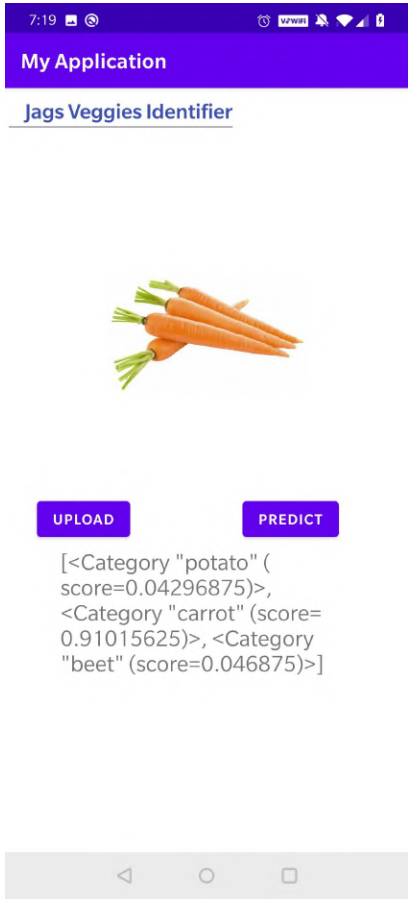
PREDICT

<Category "carrot" (score=0.0546875)>

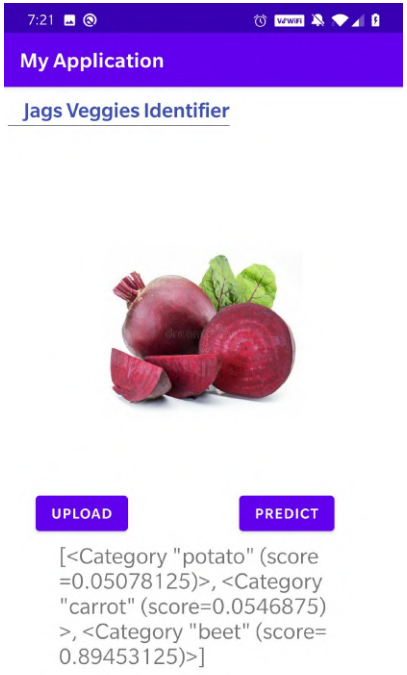
Uploaded the image for classification



Output of the model to identity carrot is 91 percent :



This is to show the beetroot was predicted with maximum score



Thank you

For any queries please check the dataset repo in google drive shared in the link :

https://drive.google.com/drive/u/1/folders/1_9yPC9ddUCGKkcwHD6CfVnGIptLWun_t