

CMPE-258 Deep Learning

Assignment – 2

By,

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(SJSU ID: 015217176)

Part 1: AutoML Models



IMAGE DATA

AI Platform (Unified) automl-image automl-image_icn ?

Dashboard Datasets Labeling tasks Notebooks Training Models Endpoints Batch predictions

IMPORT BROWSE ANALYZE

All 3,667 Labeled 3,667 Unlabeled 0

Filter labels +

Filter items

Unable to import data due to errors.

DETAILS DISMISS

Select all

daisy 633 dandelion 898 roses 640 sunflowers 697 tulips 799

ADD NEW LABEL

roses daisy tulips daisy sunflowers dandelion roses

sunflowers roses daisy

Items per page: 10 ▾ 1 – 10 of many < >

Training jobs and models

Use this dataset to train a new machine learning model with AutoML or custom code

TRAIN NEW MODEL

Labeling tasks

If your data still needs to be labeled, create a labeling task to have others label it for you

CREATE LABELING TASK

AI Platform (Unified) Training PREVIEW + CREATE

REFRESH

TRAINING PIPELINE CUSTOM JOB HYPERPARAMETER TUNING

Training pipelines are the primary model training workflow in AI Platform (Unified). You can use training pipelines to create an AutoML-trained model or a custom-trained model. For custom-trained models, training pipelines orchestrate custom training jobs and hyperparameter tuning with additional steps like adding a dataset or uploading the model to AI Platform for prediction serving. [Learn More](#)

Region
us-central1 (Iowa) ?

Filter training pipelines...

?

☰

Name	ID	Job type	Model type	Status	Created	Elapsed time
automl-image_202122753514	2339602414232928256	Training pipeline	Image classification (Single-label)	Succeeded	Feb 27, 2021, 12:35:43 AM	23 min 59 sec

⋮

AI Platform (Unified)

automl-image_202122753514

VIEW DATASET

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Dashboard

Datasets

Labeling tasks

Notebooks

Training

Models

Endpoints

Batch predictions

Filter labels

Confidence threshold 0.5

All labels

sunflowers 0.99979

tulips 0.99853

daisy 0.99824

dandelion 0.99734

roses 0.99192

All labels

Average precision 0.997

Precision 97.8%

Recall 97%

Created Feb 27, 2021, 12:59:58 AM

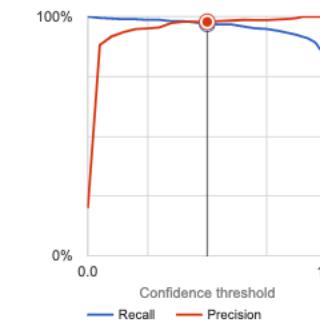
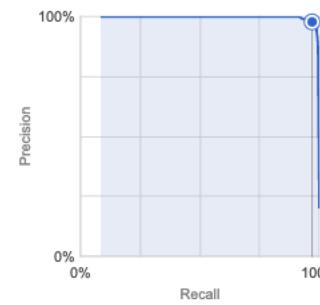
Total images 3,667

Training images 2,933

Validation images 367

Test images 367

Use the slider to see which score threshold works best for your model on the precision-recall tradeoff curve. [Learn more about these metrics and graphs](#)



Confusion matrix

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				
	roses	sunflowers	tulips	dandelion	daisy
roses	98%	2%	—	—	—
sunflowers	—	100%	—	—	—
tulips	4%	—	96%	—	—
dandelion	—	1%	—	97%	2%
daisy	—	—	—	3%	97%

AI Platform (Unified)

automl-image_202122753514

VIEW DATASET

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Deploy your model

Endpoints are machine learning models made available for online prediction requests. Endpoints are useful for timely predictions from many users (for example, in response to an application request). You can also request batch predictions if you don't need immediate results.

DEPLOY TO ENDPOINT

	Endpoint	ID	Models	Region	Last updated	API	Notification	Metadata	Encryption	⋮
<input checked="" type="radio"/>	hello_automl_image	1469545669034246144	1	us-central1	Feb 27, 2021, 1:02:22 AM	Sample request			Google-managed key	

Test your model [PREVIEW](#)

UPLOAD IMAGE

AI Platform (Unified)

automl-image_202122753514

VIEW DATASET

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Endpoint

ID

Models

Region

Last updated

API

Notification

Metadata

Encryption

[hello_automl_image](#)

1469545669034246144

1

us-central1

Feb 27, 2021, 1:02:22 AM

[Sample request](#)

Google-managed key

⋮

Test your model

PREVIEW



Item 1 of many

Filter labels

roses	0.000
sunflowers	0.001
tulips	0.000
dandelion	0.999
daisy	0.000

UPLOAD IMAGE

TEXT DATA

API APIs & Services

APIs & Services

+ ENABLE APIS AND SERVICES

1 hour 6 hours 12 hours 1 day 2 days 4 days 7 days 14 days 30 days

Dashboard

Library

Credentials

OAuth consent screen

Domain verification

Page usage agreements

Traffic



Errors



Median latency



Filter

Name	↓ Requests	Errors (%)	Latency, median (ms)	Latency, 95% (ms)
Cloud AI Platform API	26	0	60	452
BigQuery API				
BigQuery Storage API				
Cloud Datastore API				
Cloud Debugger API				
Cloud Logging API				
Cloud Monitoring API				
Cloud SQL				
Cloud Storage				
Cloud Storage API				
Cloud Trace API				

CLOUD SHELL
Terminal (automl-text-306019) +

Open Editor

Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to **automl-text-306019**.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
sheema_murugeshbabu@cloudshell:~ (automl-text-306019)\$ export PROJECT_ID=automl-text-306019
sheema_murugeshbabu@cloudshell:~ (automl-text-306019)\$ export BUCKET=\${PROJECT_ID}-lcm
sheema_murugeshbabu@cloudshell:~ (automl-text-306019)\$ gsutil mb -p \${PROJECT_ID} -l us-central1 gs://\${BUCKET}/
Creating gs://automl-text-306019-lcm/...
sheema_murugeshbabu@cloudshell:~ (automl-text-306019)\$ gsutil -m cp -R gs://cloud-ml-data/NL-classification/happiness.csv gs://\${BUCKET}/text/
Copying gs://cloud-ml-data/NL-classification/happiness.csv [Content-Type=text/csv]...
/ [1/1 files] [1.3 MiB/ 1.3 MiB] 100% Done
Operation completed over 1 objects/1.3 MiB.
sheema_murugeshbabu@cloudshell:~ (automl-text-306019)\$ []

AI Platform (Unified)

text_classification_tutorial

text_classification_tutorial... ▾



IMPORT BROWSE ANALYZE

Dashboard



Datasets



Labeling tasks



Notebooks



Training



Models



Endpoints



Batch predictions



ADD NEW LABEL



Import



Browse



Analyze



All



11,947



Labeled



11,947



Unlabeled



0



Filter items



?



Filter items



Unable to import data due to errors.



DETAILS DISMISS



Text

Labels



▼

My eldest son who is 27 just got word he has a new job after finishing his bache...

achievement



▼

I visited my best friend at her school on St. Patrick's day.

bonding



▼

My mom cooked some delicious rice for me with curd.

affection



▼

Today I make Eye contact with my crush. She Also look into my Eyes For a Seco...

affection



▼

I was dropping off my son for a sleepover. He was really excited to go. I droppe...

affection



▼

Dinner tonight was really good.

leisure



▼

I WENT TO MEENAKSHI AMMAN TEMPLE WITH MY FAMILY MEMBERS.

affection



▼

I got the test results back from my father's echo and neck arteries taken at the ...

affection



▼

I was selected as the winner for a random lottery drawing from an mturk hit. It ...

achievement



▼

My brother told me he got into med school!

affection

Items per page:

10



1 – 10 of many



Training jobs and models

Use this dataset to train a new machine learning model with AutoML or custom code

[TRAIN NEW MODEL](#)

Labeling tasks

If your data still needs to be labeled, create a labeling task to have others label it for you

[CREATE LABELING TASK](#)

AI Platform (Unified)

Training PREVIEW

+ CREATE

REFRESH

TRAINING PIPELINE

CUSTOM JOB

HYPERPARAMETER TUNING

Training pipelines are the primary model training workflow in AI Platform (Unified). You can use training pipelines to create an AutoML-trained model or a custom-trained model. For custom-trained models, training pipelines orchestrate custom training jobs and hyperparameter tuning with additional steps like adding a dataset or uploading the model to AI Platform for prediction serving. [Learn More](#)

Region

us-central1 (Iowa)



Filter training pipelines...



Name	ID	Job type	Model type	Status	Created	Elapsed time
text_classification_tutorial_2021226203222	1598197325577060352	Training pipeline	Text classification (Single-label)	Running	Feb 26, 2021, 3:33:21 PM	2 min 42 sec

Training PREVIEW

+ CREATE

REFRESH

TRAINING PIPELINE

CUSTOM JOB

HYPERPARAMETER TUNING

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Region

us-central1 (Iowa)



Filter training pipelines...



Name	ID	Job type	Model type	Status	Created	Elapsed time
text_classification_tutorial_2021226203222	1598197325577060352	Training pipeline	Text classification (Single-label)	Succeeded	Feb 26, 2021, 3:33:21 PM	4 hr 59 min



 AI Platform (Unified)

← text_classification_tutorial_2021226203222

 VIEW DATABASE

EVALUATE

Eploy & Test

Confidence threshold ? 0 100

All labels

affection 0.99178

bonding 0.97487

achievement

nature 089043

exercise 0.86730

leisure 0.85473

enjoy the moment

All labels

Average precision 0.957

Precision 89.5%

Recall 87.7%

Total items: 11,821

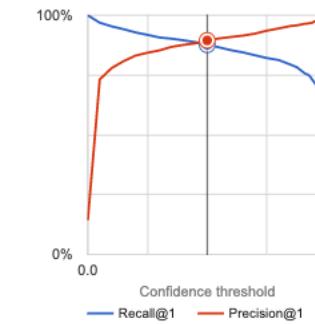
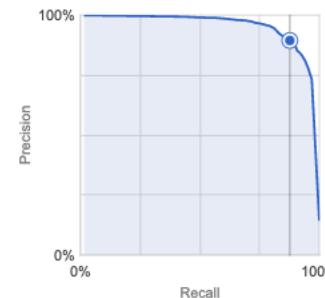
Training items

Validation items

Test items

Use the slider to see which score the

your model on the precision-recall tradeoff curve. [Learn more about these metrics and graphs](#)



Confusion matrix

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							
	enjoy_the_moment	nature	affection	leisure	bonding	achievement	exercise	
enjoy_the_moment	79%	—	3%	2%	1%	14%	1%	
nature	—	81%	4%	—	4%	12%	—	
affection	2%	—	96%	—	0%	2%	—	
leisure	13%	—	1%	72%	1%	12%	—	
bonding	1%	—	5%	—	91%	3%	—	
achievement	5%	1%	4%	2%	1%	87%	0%	
exercise	—	5%	—	—	—	10%	85%	

AI Platform (Unified)

text_classificationTutorial_2021226203222

VIEW DATASET

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Deploy your model

Endpoints are machine learning models made available for online prediction requests. Endpoints are useful for timely predictions from many users (for example, in response to an application request). You can also request batch predictions if you don't need immediate results.

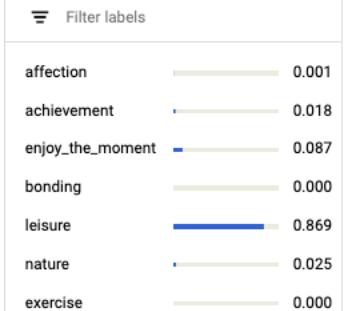
DEPLOY TO ENDPOINT

Endpoint	ID	Models	Region	Last updated	API	Notification	Metadata	Encryption
hello_automl_text	646512837132288000	1	us-central1	Feb 26, 2021, 8:37:39 PM	Sample request			Google-managed key

Test your model [PREVIEW](#)

The beach was very calm and relaxing !

PREDICT





VIDEO DATA



HOME

PREVIEW DASHBOARD

ACTIVITY

RECOMMENDATIONS

CUSTOMIZE

ⓘ How Google Cloud is helping during COVID-19. [Learn more](#)

[DISMISS](#)

Project info

Project name
automl-video

Project ID
automl-video-306102

Project number
794139617248

[ADD PEOPLE TO THIS PROJECT](#)[→ Go to project settings](#)

Resources

This project has no resources

[CREATE RESOURCE ▾](#)

Trace

No trace data from the past 7 days

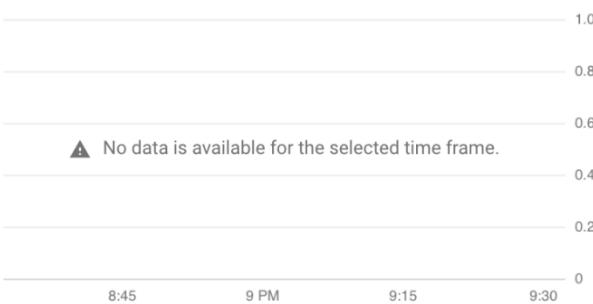
[→ Get started with Trace](#)

Getting Started

[API Explore and enable APIs](#)

API APIs

Requests (requests/sec)

[→ Go to APIs overview](#)

Google Cloud Platform status

All services normal

[→ Go to Cloud status dashboard](#)

Billing

Estimated charges USD \$0.00
For the billing period Feb 1 – 26, 2021

[→ Take a tour of billing](#)[→ View detailed charges](#)

Monitoring

Set up alerting policies

Create uptime checks

View all dashboards

[→ Go to Monitoring](#)

Error Reporting

No sign of any errors. Have you set up Error Reporting?

Google Cloud Platform automl-video Search products and resources

AI Platform (Unified) automl-video automl-video_vcn ?

Dashboard Datasets Labeling tasks Notebooks Training Models Endpoints Batch predictions

IMPORT BROWSE ANALYZE

All 500 Labeled 500 Unlabeled 0

Filter items Select all

Filter labels +

Videos ▾

cartwheel	100
golf	100
kick_ball	100
pullup	100
ride_horse	100

ADD NEW LABEL

kick_ball pullup

golf golf

ride_horse pullup

Items per page: 10 ▾ 1 – 10 of many < >

Training jobs and models

Use this dataset to train a new machine learning model with AutoML or custom code

TRAIN NEW MODEL

Labeling tasks

If your data still needs to be labeled, create a labeling task to have others label it for you

CREATE LABELING TASK

AI Platform (Unified)

Training PREVIEW

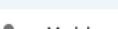
+ CREATE

REFRESH

TRAINING PIPELINE

CUSTOM JOB

HYPERPARAMETER TUNING



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Region

us-central1 (Iowa)



Filter training pipelines...



Name	ID	Job type	Model type	Status	Created	Elapsed time
automl-video_202122724917	9203088246345564160	Training pipeline	Video classification	Succeeded	Feb 26, 2021, 9:49:54 PM	2 hr 4 min



AI Platform (Unified)

[automl-video_202122724917](#)[VIEW DATASET](#)[EVALUATE](#)[TEST](#)[BATCH PREDICTIONS](#)[MODEL PROPERTIES](#)[Datasets](#)[Labeling tasks](#)[All labels](#)[Filter labels](#)Confidence threshold [?](#)

0.5

[Notebooks](#)[Training](#)[Models](#)[Endpoints](#)[Batch predictions](#)[kick_ball](#)

1

[golf](#)

1

[pullup](#)

1

[ride_horse](#)

1

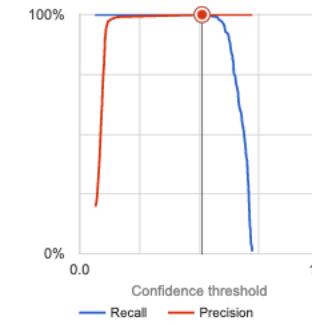
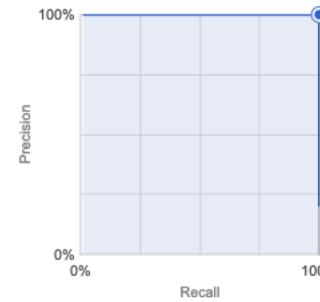
[cartwheel](#)

1

All labels

Average precision	1
Precision	100%
Recall	100%
Created	Feb 26, 2021, 11:54:18 PM
Training videos	400
Test videos	100

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

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					
	cartwheel	golf	ride_horse	kick_ball	pullup	
cartwheel	100%	—	—	—	—	
golf	—	100%	—	—	—	
ride_horse	—	—	100%	—	—	
kick_ball	—	—	—	100%	—	
pullup	—	—	—	—	100%	

AI Platform (Unified)

automl-video_202122724917

VIEW DATASET

EVALUATE

TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Batch predictions

Batch prediction intakes a group of prediction requests and outputs the results to a specified location. Use batch prediction when you don't require an immediate response and want to process accumulated data with a single request. Batch prediction can be used with [AutoML models](#) and [custom-trained models](#).

CREATE BATCH PREDICTION

Filter batch predictions

?

	Batch prediction	Last updated	Status		
	automl-video-batch	February 27, 2021	Done		

Storage

Bucket details

REFRESH LEARN

cloud-ai-platform-1b367711-2154-4f04-b363-e68c3bf764ce

OBJECTS CONFIGURATION PERMISSIONS RETENTION LIFECYCLE

Buckets > cloud-ai-platform-1b367711-2154-4f04-b363-e68c3bf764ce > predict_results > prediction-automl-video_202122724917-2021-02-27T05:00:30.122485Z

UPLOAD FILES UPLOAD FOLDER CREATE FOLDER MANAGE HOLDS DOWNLOAD DELETE

Filter by name prefix only ▾ Filter objects and folders

<input type="checkbox"/> Name	Size	Type	Created time	Storage class	Last modified	Public access	Encryption	Retention expiration date	Holds
<input type="checkbox"/> errors.jsonl	0 B	application/octet-stream	Feb 27, 2021, 12:01:57 AM	Regional	Feb 27, 2021, 12:01:57 AM	Not public	Google-managed key	—	None
<input type="checkbox"/> predictions_00001.jsonl	3.4 KB	application/octet-stream	Feb 27, 2021, 12:01:57 AM	Regional	Feb 27, 2021, 12:01:57 AM	Not public	Google-managed key	—	None
<input type="checkbox"/> predictions_00002.jsonl	2.6 KB	application/octet-stream	Feb 27, 2021, 12:01:57 AM	Regional	Feb 27, 2021, 12:01:57 AM	Not public	Google-managed key	—	None
<input type="checkbox"/> predictions_00003.jsonl	2.6 KB	application/octet-stream	Feb 27, 2021, 12:01:57 AM	Regional	Feb 27, 2021, 12:01:57 AM	Not public	Google-managed key	—	None
<input type="checkbox"/> predictions_00004.jsonl	3.4 KB	application/octet-stream	Feb 27, 2021, 12:01:57 AM	Regional	Feb 27, 2021, 12:01:57 AM	Not public	Google-managed key	—	None
<input type="checkbox"/> predictions_00005.jsonl	3.4 KB	application/octet-stream	Feb 27, 2021, 12:01:57 AM	Regional	Feb 27, 2021, 12:01:57 AM	Not public	Google-managed key	—	None

Release Notes

<

AI Platform (Unified)



gs://automl-video-demo-data/hmdb51/how_to_do_a_cartwheel_cartwheel_f_cm_np1_ri_med_0.mp4 [0-3]



▶ < > 0:00:00 / 0:00:00

Confidence threshold

0.00

Predict on:

SHOT

SEGMENT

INTERVAL



Filter labels		
cartwheel (1)	0:00:00.00-0:00:03.00	0.673
golf (1)	0:00:00.00-0:00:03.00	0.086
kick_ball (1)	0:00:00.00-0:00:03.00	0.076
pullup (1)	0:00:00.00-0:00:03.00	0.083
ride_horse (1)	0:00:00.00-0:00:03.00	0.082



CUSTOM DATA

AI Platform (Unified)

Training PREVIEW

+ CREATE

REFRESH

TRAINING PIPELINE

CUSTOM JOB

HYPERPARAMETER TUNING

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Region

us-central1 (Iowa)



Filter training pipelines...



Name	ID	Job type	Model type	Status	Created	Elapsed time
hello_custom	853414537200664576	Training pipeline	Custom	Succeeded	Feb 27, 2021, 12:46:14 PM	13 min 50 sec

 AI Platform (Unified)

← hello_custom-custom-job

i Custom job was completed on Feb 27, 2021, 12:59:36 PM.

Status	Succeeded
Custom job ID	3169953595529363
Created	Feb 27, 2021, 12:46:3
Start time	Feb 27, 2021, 12:53:0
Elapsed time	6 min 33 sec
Region	us-central1
Encryption type	Google-managed key

Machine type (Worker pool 0)	n1-standard-4
Machine count (Worker pool 0)	1
Container Location (Worker pool 0)	us-docker.pkg.dev/cloud-aiplatform/training/tf-cpu.2-1:lates

Algorithm	Custom training
Objective	Custom
Container (Training)	Prebuilt; TensorFlow 2.1; Python 3.7
Package locations	gs://hello_custom_automl-custom-306117/training/hello-custom-training-2.0.tar.gz
Logs	View logs

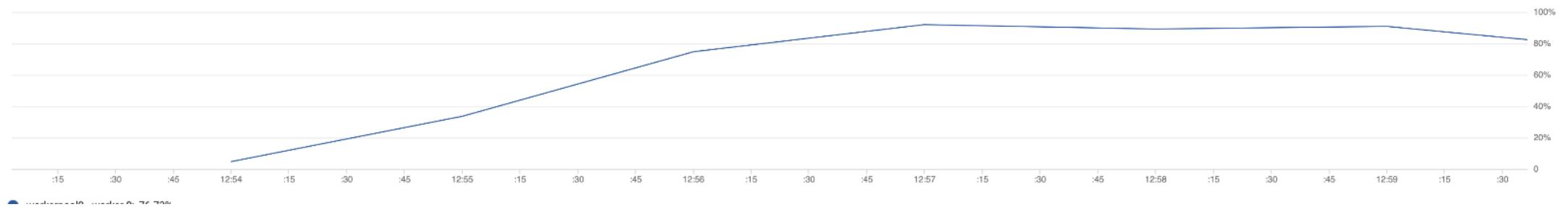
VIEW CUSTOM JOB INPUTS IN JSON

CPU GPU NETWORK

[COLLAPSE ALL](#) [EXPAND ALL](#)

CPU utilization

Percent



 AI Platform (Unified)

 hello_custom-custom-job

Algorithm	Custom training
Objective	Custom
Container (Training)	Prebuilt; TensorFlow 2.1; Python 3.7
Package locations	gs://hello_custom_automl-custom-306117/training/hello-custom-training-2.0.tar.gz
Logs	View logs

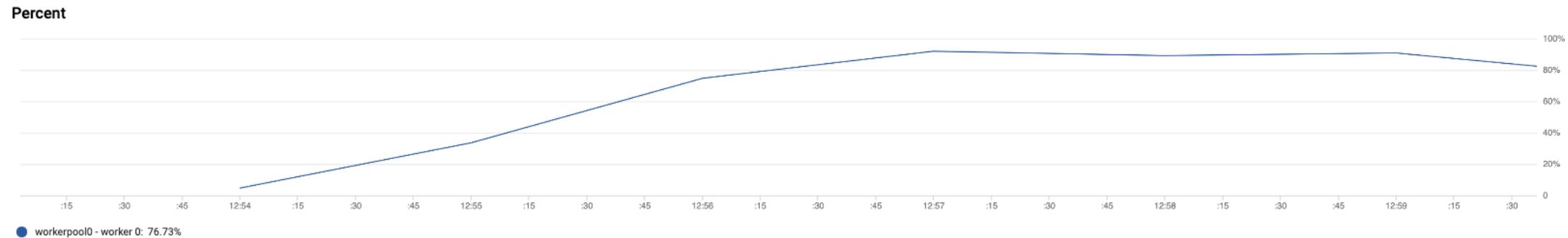
VIEW CUSTOM JOB INPUTS IN JSON

CPU GPU NETWORK

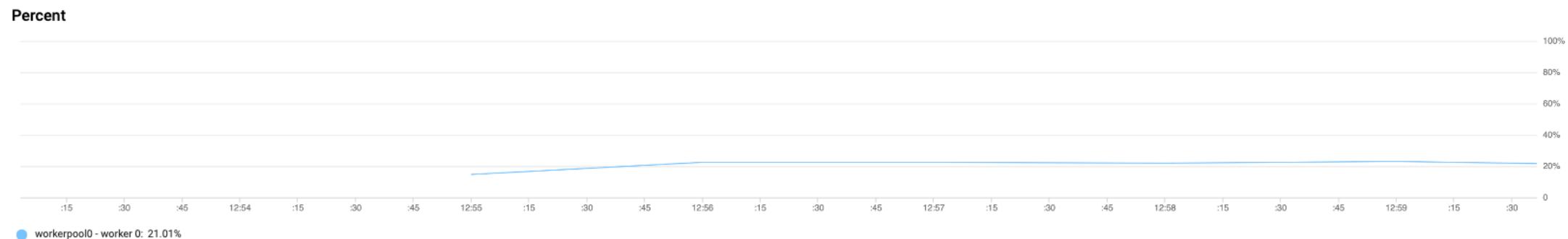
COLLAPSE A

[EXPAND ALL](#)

CPU utilization



CPU memory utilization



AI Platform (Unified)

Endpoints PREVIEW

+ CREATE ENDPOINT

REFRESH

Dashboard

Endpoints are machine learning models made available for online prediction requests. Endpoints are useful for timely predictions from many users (for example, in response to an application request). You can also request batch predictions if you don't need immediate results.

Datasets

Labeling tasks

Notebooks

Training

Models

Endpoints

1 selected EDIT METADATA

AI Platform (Unified)

Endpoints PREVIEW

+ CREATE ENDPOINT

REFRESH

Dashboard

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Datasets

Labeling tasks

Notebooks

Training

Models

Endpoints

To create an endpoint, you need at least one machine learning model

Region
us-central1 (Iowa) ?

1 selected EDIT METADATA

Endpoint	ID	Models	Region	Last updated	API	Notification	Metadata
<input checked="" type="checkbox"/> <input checked="" type="radio"/> hello_custom	8432110692949032960	1	us-central1	Feb 27, 2021, 1:49:21 PM	Sample request		

⋮

CLOUD SHELL

Terminal (automl-custom-306117) x +

Open Editor ⋮

```
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$ PROJECT_ID=automl-custom-306117
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$ BUCKET_NAME=hello_custom_automl-custom-306117
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$ echo "export const CLOUD_FUNCTION_URL = 'https://us-central1-$PROJECT_ID.cloudfunctions.net/classify_flower';" \
>   > webapp/function-url.js
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$ gsutil -m cp -r webapp gs://$(BUCKET_NAME)/
Copying file://webapp/index.html [Content-Type=text/html]...
Copying file://webapp/function-url.js [Content-Type=application/javascript]...
Copying file://webapp/.index.html [Content-Type=text/html]...
Copying file://webapp/index.css [Content-Type=text/css]...
Copying file://webapp/image-list.txt [Content-Type=text/plain]...
Copying file://webapp/main.js [Content-Type=application/javascript]...
- [6/6 files][133.4 KiB/133.4 KiB] 100% Done
Operation completed over 6 objects/133.4 KiB.
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$ gsutil -m acl ch -u AllUsers:R gs://$(BUCKET_NAME)/webapp/**
Updated ACL on gs://hello_custom_automl-custom-306117/webapp/function-url.js
Updated ACL on gs://hello_custom_automl-custom-306117/webapp/main.js
Updated ACL on gs://hello_custom_automl-custom-306117/webapp/.index.html
Updated ACL on gs://hello_custom_automl-custom-306117/webapp/index.css
Updated ACL on gs://hello_custom_automl-custom-306117/webapp/image-list.txt
Updated ACL on gs://hello_custom_automl-custom-306117/webapp/index.html
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$
```

Hello custom training

Click on any of the following images to request a prediction from your image classification model.

[GET SIX NEW IMAGES](#)



roses



dandelion



tulips



dandelion



dandelion



roses

Hello custom training

Click on any of the following images to request a prediction from your image classification model.

[GET SIX NEW IMAGES](#)



roses



dandelion



tulips

Prediction (probabilities):

- roses: 0.415763706
- dandelion: 0.383586
- daisy: 0.115744948
- tulips: 0.0847659335
- sunflowers: 0.000139539043



dandelion



dandelion

Prediction (probabilities):

- dandelion: 0.95776546
- sunflowers: 0.0362311751
- tulips: 0.00491153495
- daisy: 0.000797320739
- roses: 0.000294619414



roses

HOME

PREVIEW

DASHBOARD

ACTIVITY

RECOMMENDATIONS

CUSTOMIZE

How Google Cloud is helping during COVID-19. [Learn more](#)

DISMISS

Project info

Project name
automl-custom

Project ID
automl-custom-306117

Project number
1050715738802

[ADD PEOPLE TO THIS PROJECT](#)

Resources

This project has no resources

[CREATE RESOURCE](#) ▾

Trace

No trace data from the past 7 days

[Get started with Trace](#)

Getting Started

API Explore and enable APIs

Solution Deploy a prebuilt solution

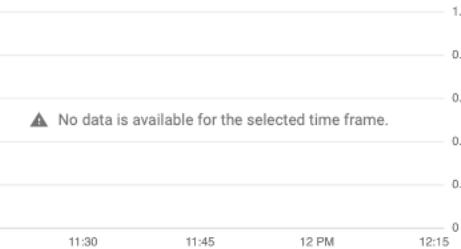
Cloud Add dynamic logging to a running application

Error Reporting Monitor errors with Error Reporting

Cloud Trace Optimize your trace data with Cloud Trace

API APIs

Requests (requests/sec)



[Go to APIs overview](#)

Google Cloud Platform status

All services normal

[Go to Cloud status dashboard](#)

Billing

Estimated charges
For the billing period Feb 1 – 27, 2021

USD \$0.00

[Take a tour of billing](#)

[View detailed charges](#)

Monitoring

Set up alerting policies

Create uptime checks

[View all dashboards](#)

[Go to Monitoring](#)

Error Reporting

No sign of any errors. Have you set up Error Reporting?

[Learn how to set up Error Reporting](#)

News

Optimizing your bucket options in Cloud Storage

How Google Cloud is helping during COVID-19. [Learn more](#)

DISMISS

Project info

Project name
automl-custom

Project ID
automl-custom-306117

Project number
1050715738802

[ADD PEOPLE TO THIS PROJECT](#)

[Go to project settings](#)

Resources

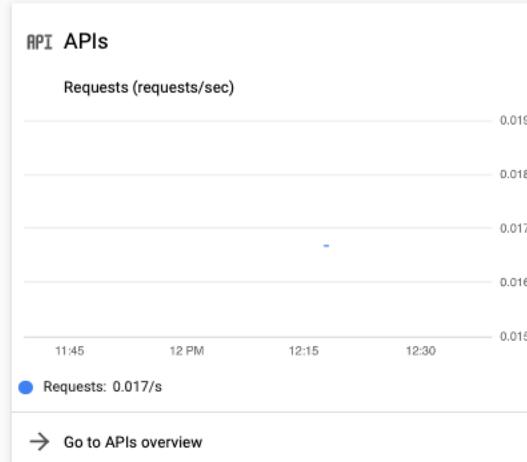
This project has no resources

[CREATE RESOURCE](#)

Trace

No trace data from the past 7 days

[Get started with Trace](#)



Google Cloud Platform status

All services normal

[Go to Cloud status dashboard](#)

Billing

Estimated charges USD \$0.00
For the billing period Feb 1 – 27, 2021

[Take a tour of billing](#)

[View detailed charges](#)

Monitoring

Set up alerting policies

Create uptime checks

[View all dashboards](#)

[Go to Monitoring](#)

CLOUD SHELL
Terminal (automl-custom-306117) X + *

[Open Editor](#)

```
copying hello_custom_training.egg-info/SOURCES.txt -> hello-custom-training-2.0/hello_custom_training.egg-info
copying hello_custom_training.egg-info/dependency_links.txt -> hello-custom-training-2.0/hello_custom_training.egg-info
copying hello_custom_training.egg-info/requirements.txt -> hello-custom-training-2.0/hello_custom_training.egg-info
copying hello_custom_training.egg-info/top_level.txt -> hello-custom-training-2.0/hello_custom_training.egg-info
copying trainer/_init_.py -> hello-custom-training-2.0/trainer
copying trainer/task.py -> hello-custom-training-2.0/trainer
Writing hello-custom-training-2.0/setup.cfg
Creating tar archive
removing 'hello-custom-training-2.0' (and everything under it)
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$ gsutil cp dist/hello-custom-training-2.0.tar.gz gs://hello_custom_automl-custom-306117/training/
Copying file://dist/hello-custom-training-2.0.tar.gz [Content-Type=application/x-tar]...
/[1 files][ 1.9 KiB/ 1.9 KiB]
Operation completed over 1 objects/1.9 KiB.
sheema_murugeshbabu@cloudshell:~/hello-custom-sample (automl-custom-306117)$
```

TABULAR DATA

HOME

PREVIEW

DASHBOARD

ACTIVITY

RECOMMENDATIONS

CUSTOMIZE

How Google Cloud is helping during COVID-19. [Learn more](#)

DISMISS

Project info

Project name
automl-tabular

Project ID
automl-tabular-306121

Project number
518898002273

[ADD PEOPLE TO THIS PROJECT](#)

[Go to project settings](#)

Resources

This project has no resources

[CREATE RESOURCE ▾](#)

Trace

No trace data from the past 7 days

[Get started with Trace](#)

Getting Started

[API Explore and enable APIs](#)

[Deploy a prebuilt solution](#)

[Add dynamic logging to a running application](#)

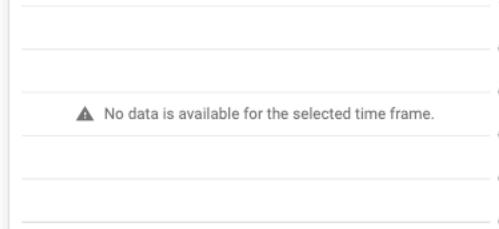
[Monitor errors with Error Reporting](#)

[Deploy a Hello World app](#)

[Take a VM quickstart](#)

API APIs

Requests (requests/sec)



[Go to APIs overview](#)

Google Cloud Platform status

All services normal

[Go to Cloud status dashboard](#)

Monitoring

[Set up alerting policies](#)

[Create uptime checks](#)

[View all dashboards](#)

[Go to Monitoring](#)

Error Reporting

No sign of any errors. Have you set up Error Reporting?

[Learn how to set up Error Reporting](#)

News

Optimizing your bucket options in Cloud Storage
8 hours ago

With SRE, failing to plan is planning to fail
1 day ago

Troubleshooting services on Google Kubernetes Engine by example
1 day ago

[Read all news](#)

[Read all release notes NEW](#)

AI Platform (Unified)

Structured_AutoML_Tutorial

SOURCE

ANALYZE

Dataset Info

Created: Feb 27, 2021 4:31 PM

Dataset format: CSV

Dataset location: <gs://cloud-ml.../bank-marketing.csv>

Summary

Total columns: 17

Total rows: -

GENERATE STATISTICS

Enter property name or value

?

Field Name ↑ Missing % (count) ? Distinct values ?

Age

-

-

Balance

-

-

Campaign

-

-

Contact

-

-

Day

-

-

Default

-

-

Deposit

-

-

Duration

-

-

Education

-

-

Housing

-

-

Job

-

-

Loan

-

-

MaritalStatus

-

-

Month

-

-

PDays

-

-

POutcome

-

-

Previous

-

-

Rows per page: 50 ▾ 1 – 17 of 17 < >

Training jobs and models

Use this dataset to train a new machine learning model with AutoML or custom code

TRAIN NEW MODEL

AI Platform (Unified)

Structured_AutoML_Tutorial

SOURCE

ANALYZE

Dataset Info

Created: Feb 27, 2021 4:31 PM

Dataset format: CSV

Dataset location: <gs://cloud-ml.../bank-marketing.csv>

Summary

Total columns: 17

Total rows: 45,211

General statistics generated by Feb 27, 2021 4:40 PM

Enter property name or value

Field Name ↑ Missing % (count) ? Distinct values ?

Age	-	77
Balance	-	7168
Campaign	-	48
Contact	-	3
Day	-	31
Default	-	2
Deposit	-	2
Duration	-	1573
Education	-	4
Housing	-	2
Job	-	12
Loan	-	2
MaritalStatus	-	3
Month	-	12
PDays	-	559
POutcome	-	4
Previous	-	41

Rows per page: 50 ▾ 1

DONE

Age

Column name: Age

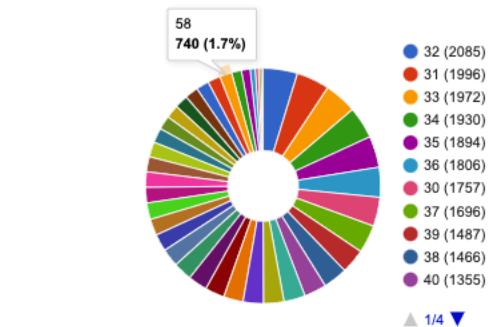
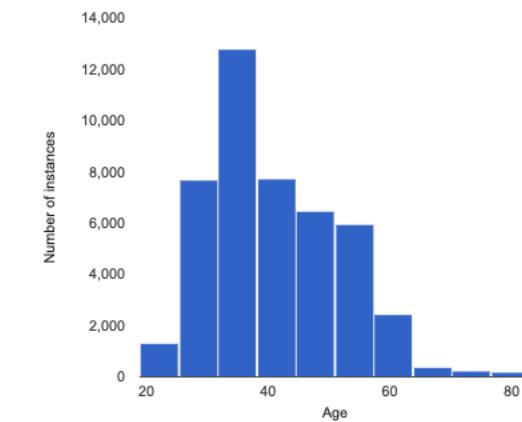
Missing % (count): -

Distinct values: 77

Mean: 40.936

Standard Deviation: 10.619

Most common value (%): 32(4.739%)



▲ 1/4 ▼

AI Platform (Unified)

Structured_AutoML_Tutorial

SOURCE

ANALYZE

Datasets

Created: Feb 27, 2021 4:31 PM
Dataset format: CSV
Dataset location: gs://cloud-ml-.../bank-marketing.csv

Summary

Total columns: 17
Total rows: 45,211

General statistics generated by Feb 27, 2021 4:40 PM

Enter property name or value

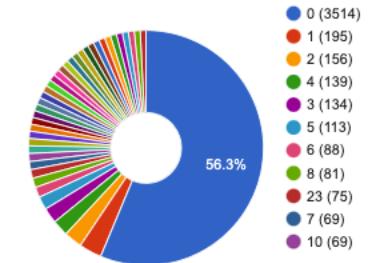
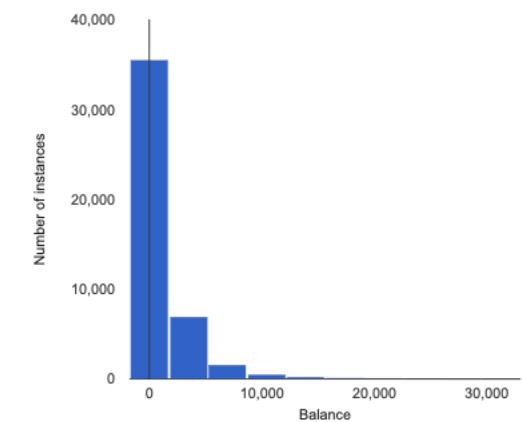
Field Name	Missing % (count)	Distinct values
Age	-	77
Balance	-	7168
Campaign	-	48
Contact	-	3
Day	-	31
Default	-	2
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Duration	-	1573
Education	-	4
Housing	-	2
Job	-	12
Loan	-	2
MaritalStatus	-	3
Month	-	12
PDays	-	559
POutcome	-	4
Previous	-	41

Rows per page: 50 ▾ 1

Balance

Column name: Balance

Missing % (count): -
Distinct values: 7,168
Mean: 1,362.272
Standard Deviation: 3,044.732
Most common value (%): 0(56.305%)



1/4 ▾

Jan

Feb

DONE

Google Cloud Platform automl-tabular ▾

Search products and resources

REFRESH

AI Platform (Unified) Training PREVIEW + CREATE

Dashboard Datasets Labeling tasks Notebooks Training Models Endpoints Batch predictions

TRAINING PIPELINE CUSTOM JOB HYPERPARAMETER TUNING

Training pipelines are the primary model training workflow in AI Platform (Unified). You can use training pipelines to create an AutoML-trained model or a custom-trained model. For custom-trained models, training pipelines orchestrate custom training jobs and hyperparameter tuning with additional steps like adding a dataset or uploading the model to AI Platform for prediction serving. [Learn More](#)

Region us-central1 (Iowa) ?

Filter training pipelines...

Name	ID	Job type	Model type	Status	Created	Elapsed time
Structured_AutoML_Tutorial_2021227214253	5974007313520918528	Training pipeline	Tabular classification	Succeeded	Feb 27, 2021, 4:45:04 PM	1 hr 7 min

AI Platform (Unified)

Structured_AutoML_Tutorial_2021227214253

VIEW DATASET

EXPORT

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Filter labels

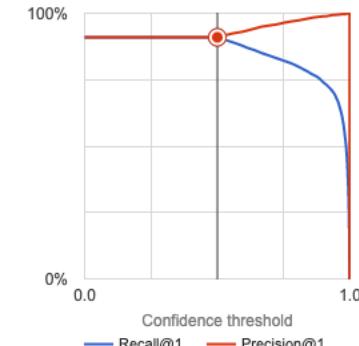
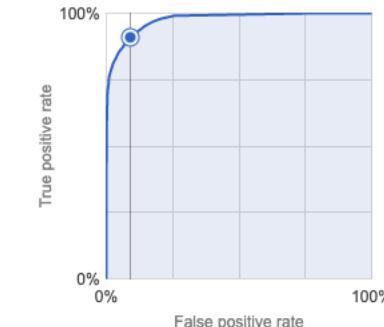
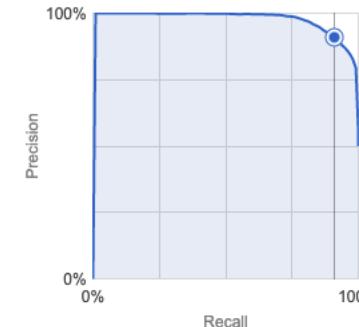
Confidence threshold 0.5

All labels	0
1	0.99145
2	0.61646

All labels

PR AUC	0.978
ROC AUC	0.976
Log loss	0.192
F1 score	0.909559
Precision	91%
Recall	91%
Created	Feb 27, 2021, 5:52:42 PM

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

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	
	1	2
1	96%	4%
2	51%	49%

Feature Importance

 Item counts



AI Platform (Unified)

Structured_AutoML_Tutorial_2021227214253

VIEW DATASET

EXPORT

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Filter labels

Confidence threshold ?

0.5

All labels

2

51%

49%

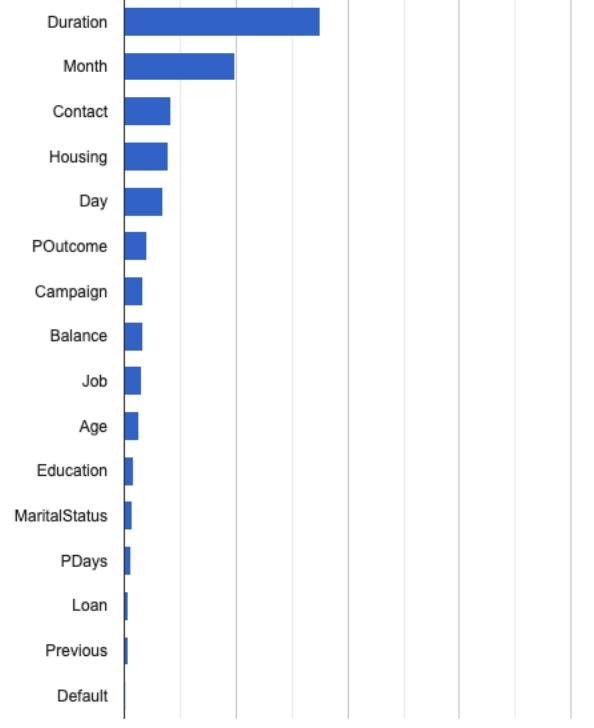
1

0.99145

2

0.61646

Feature Importance



AI Platform (Unified)

Structured_AutoML_Tutorial_2021227214253

VIEW DATASET

EXPORT

EVALUATE

DEPLOY & TEST

BATCH PREDICTIONS

MODEL PROPERTIES

Deploy your model

Endpoints are machine learning models made available for online prediction requests. Endpoints are useful for timely predictions from many users (for example, in response to an application request). You can also request batch predictions if you don't need immediate results.

DEPLOY TO ENDPOINT

Endpoint	ID	Models	Region	Last updated	API	Notification	Metadata	Encryption
Structured_AutoML_Tutorial	7198124395049517056	1	us-central1	Feb 27, 2021, 6:02:23 PM	Sample request			Google-managed key

Test your model PREVIEW

Feature column name	Type	Required or optional	Value	Local feature importance
Age	Text	Required	38.000000	--
Balance	Text	Required	389.000000	--
Campaign	Text	Required	2.000000	--
Contact	Text	Required	cellular	--
Day	Text	Required	15.000000	--
Default	Text	Required	no	--
Duration	Text	Required	171.000000	--
Education	Text	Required	secondary	--

Predicted column not yet known

Prediction result

--

AI Platform (Unified)

Structured_AutoML_Tutorial_2021227214253

[VIEW DATASET](#)[EXPORT](#)[EVALUATE](#)[DEPLOY & TEST](#)[BATCH PREDICTIONS](#)[MODEL PROPERTIES](#)Test your model [PREVIEW](#)

Feature column name	Type	Required or optional	Value	Local feature importance
Age	Text	Required	38.000000	0
Balance	Text	Required	389.000000	0
Campaign	Text	Required	2.000000	0
Contact	Text	Required	cellular	0
Day	Text	Required	15.000000	0
Default	Text	Required	no	0
Duration	Text	Required	171.000000	0
Education	Text	Required	secondary	0
Housing	Text	Required	yes	0
Job	Text	Required	blue-collar	0

Predict label

Prediction result

1

Confidence score: 0.9915143847465515

Rows per page: 10 ▾ 1 – 10 of 16 < >

[PREDICT](#)[RESET](#)