1. Text Data:

Here I am using the same project that I have created for Image classification AutoML.

1. Project id: hw2p1-image

Project name *

hw2p1-image   ❓

Project ID: hw2p1-image. It cannot be changed later.   EDIT

Organization *

sjsu.edu   ▼   ❓

Select an organization to attach it to a project. This selection can't be changed later.

Location *

🏢 sjsu.edu   BROWSE

Parent organization or folder

CREATE   CANCEL

2. API is enabled

≡ Google Cloud Platform ⁚• hw2p1-image ▼

The API is enabled

Cloud AI Platform API has been enabled.

Next, to use the API you'll need the right credentials.

Go to credentials

3. Authentication Setup

Create service account key

Service account

New service account ▼

Service account name ❓	Role ❓
hw2p1	Owner ▼

Service account ID

hw2p1-306   @hw2p1-image.iam.gserviceaccount.com ⟳

Key type

Downloads a file that contains the private key. Store the file securely because this key can't be recovered if lost.

◉ **JSON**
    Recommended
○ **P12**
    For backward compatibility with code using the P12 format

Create   Cancel

4. Set environment variable


```
Microsoft Windows [Version 10.0.19041.804]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>set GOOGLE_APPLICATION_CREDENTIALS=C:\Users\subar\Downloads\Study\8_CMPE-258-Sec49-DeepLearning\hw2\
hw2p1-image-3ce38964a5bf.json

C:\WINDOWS\system32>
```

5. Cloud Console:


```
Welcome to Cloud Shell! Type "help" to get started.
To set your Cloud Platform project in this session use "gcloud config set project [PROJECT_ID]"
subarnachowdhury_soma@cloudshell:~$ gcloud config set project hw2p1-image
Updated property [core/project].
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ ▯
```

6. Created Google Cloud Storage Bucket

```
Updated property [core/project].
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ export PROJECT_ID=hw2p1-image
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ export BUCKET=${PROJECT_ID}-lcm
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ gsutil mb -p ${PROJECT_ID} -l us-central1 gs://${BUCKET}/
Creating gs://hw2p1-image-lcm/...
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ []
```

7. Copying data set to storage:

```
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ gsutil -m cp -R gs://cloud-ml-data/NL-classification/happiness.csv gs://${BUCKET}/text/
Copying gs://cloud-ml-data/NL-classification/happiness.csv [Content-Type=text/csv]...
/ [1/1 files][  1.3 MiB/  1.3 MiB] 100% Done
Operation completed over 1 objects/1.3 MiB.
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ []
```

8. Create Dataset 'hw2p1-text_classification'

← hw2p1-text_classification   hw2p1-text_classification... ▼   ?

IMPORT   BROWSE   ANALYZE

Add text documents to your dataset

Before you begin, read the data guide to learn how to prepare your data. Then choose an in method.

Select an import method

- **Upload text documents**: Recommended if you don't have labels yet
- **Import files**: Recommended if you already have labels. An import file is a list of Cloud Storage URIs to your text documents and optional data, like labels. Learn how to create an import file

◉ Upload text documents from your computer
◯ Upload import files from your computer
◯ Select import files from Cloud Storage

Upload text documents from your computer

Add up to 500 text documents per upload. Text documents will be preprocessed and store Cloud Storage.

SELECT FILES

9. Import Data from Storage

← hw2p1-text_classification   hw2p1-text_classification... ▼   ❓

IMPORT   BROWSE   ANALYZE

Select an import method

- **Upload text documents**: Recommended if you don't have labels yet
- **Import files**: Recommended if you already have labels. An import file is a list of Cloud Storage URIs to your text documents and optional data, like labels. Learn how to create an import file

○ Upload text documents from your computer
○ Upload import files from your computer
◉ Select import files from Cloud Storage

Select import files from Cloud Storage

Text documents referenced in the import files will be preprocessed and stored in a new Cloud Storage bucket (charges apply)

Import file path *
☑ gs:// hw2p1-image-lcm/text/happiness.csv   BROWSE ❓   Data split: Automatic ▼ ❓

ADD ANOTHER FILE

What happens next?

You'll be emailed after the text documents are imported and your dataset is ready

CONTINUE

10. Finished Importing Data

AI Platform finished importing data into dataset "hw2p1-text_classification" Inbox ×

AI Platform <noreply-aiplatform@google.com>
to me ▼

Hello AI Platform Customer,

AI Platform finished importing data into
dataset "hw2p1-text_classification".
Additional Details:
Operation State: Succeeded
Resource Name:
projects/589827040428/locations/us-central1/datasets/7954007852819939328

To continue your progress, go back to your dataset using
https://console.cloud.google.com/ai/platform/locations/us-central1/datasets/7954007852819939328;annotationSetId=8748330237097410560

Sincerely,
The Google Cloud AI Team

11. Created model 'hw2p1-textdata_model' and Selecting Training Model:

Train new model

1 Choose training method

2 Define your model

[START TRAINING] CANCEL

Dataset *
hw2p1-text_classification (11947 text items) ▼ ❓

Annotation set *
hw2p1-text_classification_tcn ▼ ❓

Objective
Text classification (Single-label) ▼

Please refer to the pricing guide for more details (and available deployment options) for each method.

🔘 AutoML
Train high-quality models with minimal effort and machine learning expertise. **AutoML** training automatically ends when you model stops improving. Learn more

⚪ Custom training (advanced)
Run your TensorFlow, scikit-learn, and XGBoost training applications in the cloud. Train with one of Google Cloud's pre-built containers or use your own. Learn more

[CONTINUE]

12. Got Email Notification about successful training

AI Platform finished training model "hw2p1-text_classification_2021221233425"

AI Platform <noreply-aiplatform@google.com>
to me ▾

Hello AI Platform Customer,

AI Platform finished training
model "hw2p1-text_classification_2021221233425".
Additional Details:
Operation State: Succeeded
Resource Name:
projects/589827040428/locations/us-central1/trainingPipelines/9132015814726123520

To continue your progress, go back to your training pipeline using
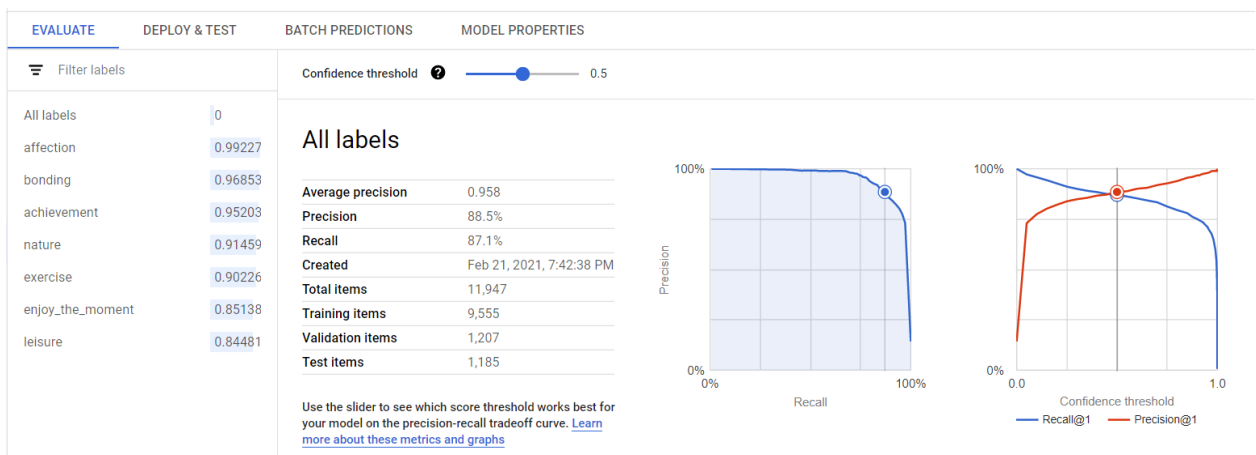https://console.cloud.google.com/ai/platform/models?authuser=1&project=hw2p1-image

Sincerely,
The Google Cloud AI Team

13. Trained Model: It has taken 4+ hours to train

	Name	ID	Data	Endpoints	Region	Type	Created
✔	hw2p1-text_classification_2021221233425	3241764898962669568	hw2p1-text_classification_tcn	0	us-central1	▤ Text classification	Feb 21, 2021, 3:38:00 PM

14. Evaluation

EVALUATE   DEPLOY & TEST   BATCH PREDICTIONS   MODEL PROPERTIES

Filter labels

Confidence threshold ❓ ──────●──── 0.5

All labels	0
affection	0.99227
bonding	0.96853
achievement	0.95203
nature	0.91459
exercise	0.90226
enjoy_the_moment	0.85138
leisure	0.84481

All labels

Average precision	0.958
Precision	88.5%
Recall	87.1%
Created	Feb 21, 2021, 7:42:38 PM
Total items	11,947
Training items	9,555
Validation items	1,207
Test items	1,185

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

Recall@1   Precision@1

15. Confusion Matrix

True label / Predicted label	leisure	bonding	achievement	exercise	affection	nature	enjoy_the_moment
leisure	72%	1%	9%	—	4%	—	13%
bonding	—	91%	4%	—	5%	—	1%
achievement	3%	1%	86%	1%	5%	1%	5%
exercise	—	—	10%	85%	—	5%	—
affection	—	1%	2%	—	96%	—	1%
nature	—	4%	8%	—	4%	85%	—
enjoy_the_moment	4%	1%	17%	1%	3%	1%	73%

16. Created Deployment Endpoint 'hw2p2-hello_automl_text'

Deploy to endpoint

1. Define your endpoint
2. Endpoint details

DEPLOY   CANCEL

◉ Create new endpoint   ◯ Add to existing endpoint

Endpoint name *
hw2p2-hello_automl_text   ❓

Model settings

hw2p1-text_classification_2021221233425   ⌃
Traffic split *
100   % ❓

ⓘ   For natural language processing (NLP), AutoML models
    automatically scale their compute resources to maximize
    efficiency and cost-effectiveness.

Logging

17. Successful Deployment

AI Platform finished creating endpoint "hw2p2-hello_automl_text" Inbox ×

AI Platform <noreply-aiplatform@google.com>
to me ▾

Hello AI Platform Customer,

AI Platform finished creating endpoint "hw2p2-hello_automl_text".
Additional Details:
Operation State: Succeeded
Resource Name:
projects/589827040428/locations/us-central1/endpoints/917432502216294400

To continue your progress, go back to your endpoint using
https://console.cloud.google.com/ai/platform/locations/us-central1/models/3241764898962669568/deploy?authuser=1&project=hw2p1-image

Sincerely,
The Google Cloud AI Team

	Endpoint	ID	Models	Region	Last updated	API	Notification	Metadata	Encryption
✓	hw2p2-hello_automl_text	917432502216294400	1	us-central1	Feb 21, 2021, 7:53:27 PM	Sample request			Google-managed key

18. Prediction 100% Correct

Test your model PREVIEW

I am feeling overwhelmed.

PREDICT

Filter labels

affection		0.000
achievement		0.905
enjoy_the_moment		0.090
bonding		0.000
leisure		0.004
nature		0.000
exercise		0.000

Test your model PREVIEW

I have completed part 2-Text classification assignment.

PREDICT

Filter labels

affection		0.000
achievement		1.000
enjoy_the_moment		0.000
bonding		0.000
leisure		0.000
nature		0.000
exercise		0.000

19. Removed Storage

```
CommandException: Encountered non-existent bucket during listing
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ gsutil -m rm -rf gs://hw2p1-image-lcm
Removing gs://hw2p1-image-lcm/text/happiness.csv#1613948229909685...
/ [1/1 objects] 100% Done
Operation completed over 1 objects.
Removing gs://hw2p1-image-lcm/...
subarnachowdhury_soma@cloudshell:~ (hw2p1-image)$ []
```