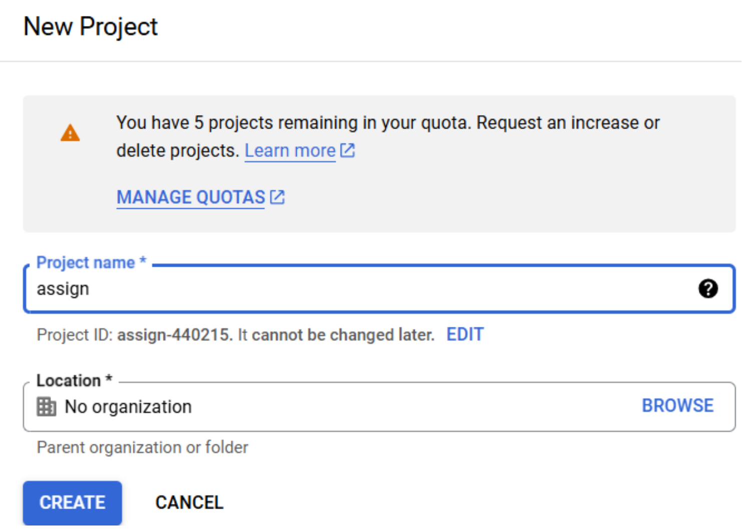
Assignment 3

Exercise 1

1) Create a new project in the Google Cloud Console called “assign”



New Project

You have 5 projects remaining in your quota. Request an increase or delete projects. Learn more

MANAGE QUOTAS

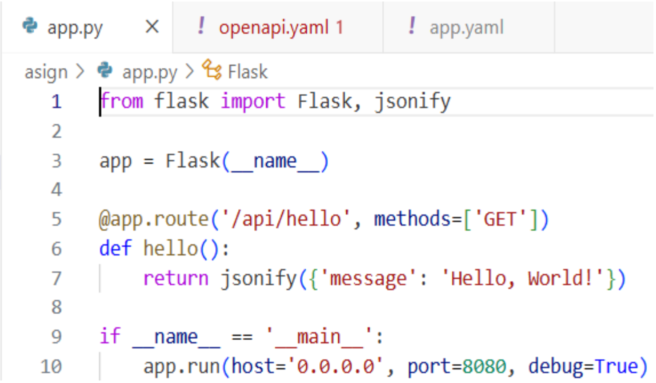
Project name *: assign

Project ID: assign-440215. It cannot be changed later. EDIT

Location *: No organization BROWSE

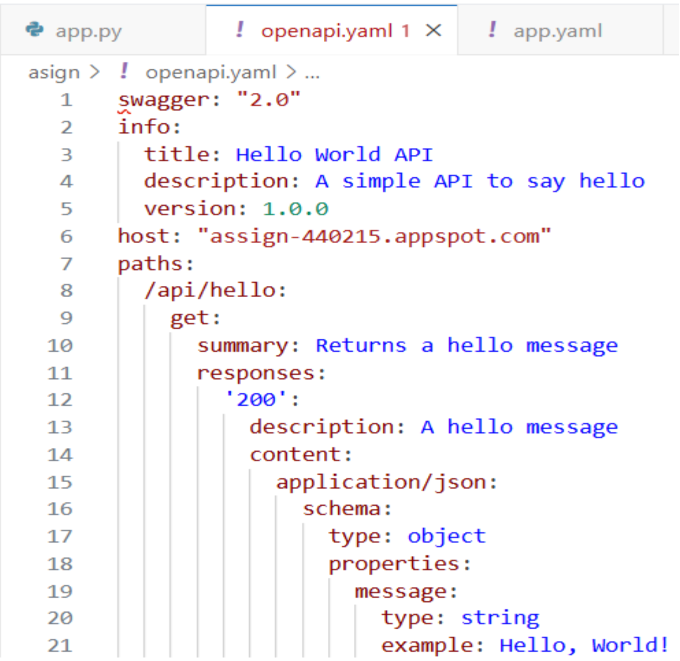
Parent organization or folder

2) Create a simple REST API using Python Flask



```python
from flask import Flask, jsonify

app = Flask(__name__)

@app.route('/api/hello', methods=['GET'])
def hello():
    return jsonify({'message': 'Hello, World!'})

if __name__ == '__main__':
    app.run(host='0.0.0.0', port=8080, debug=True)
```

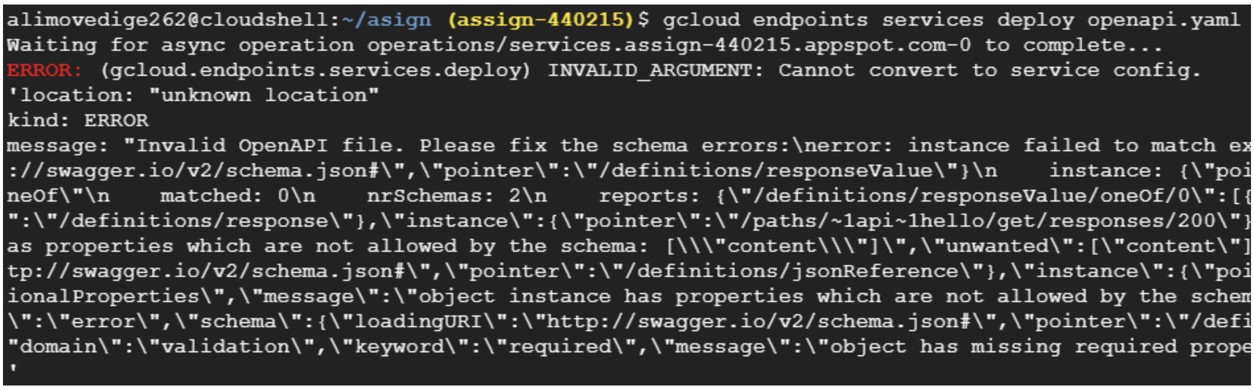
3) Create an openapi.yaml file to define your API.



```yaml
swagger: "2.0"
info:
  title: Hello World API
  description: A simple API to say hello
  version: 1.0.0
host: "assign-440215.appspot.com"
paths:
  /api/hello:
    get:
      summary: Returns a hello message
      responses:
        '200':
          description: A hello message
          content:
            application/json:
              schema:
                type: object
                properties:
                  message:
                    type: string
                    example: Hello, World!
```

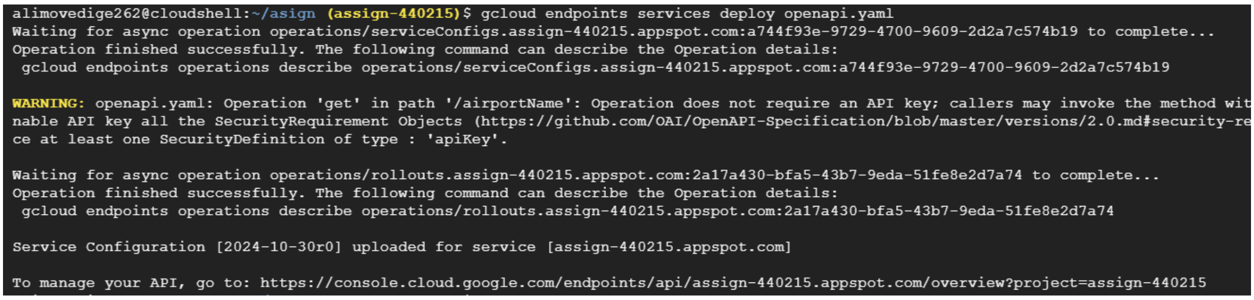
4) Create a new service and open the API configuration. To do this, use the following command to develop the Open API specification. This team has created a new service in Google Cloud Endpoints

Below openapi.yaml code have some mistakes thats'why i get error



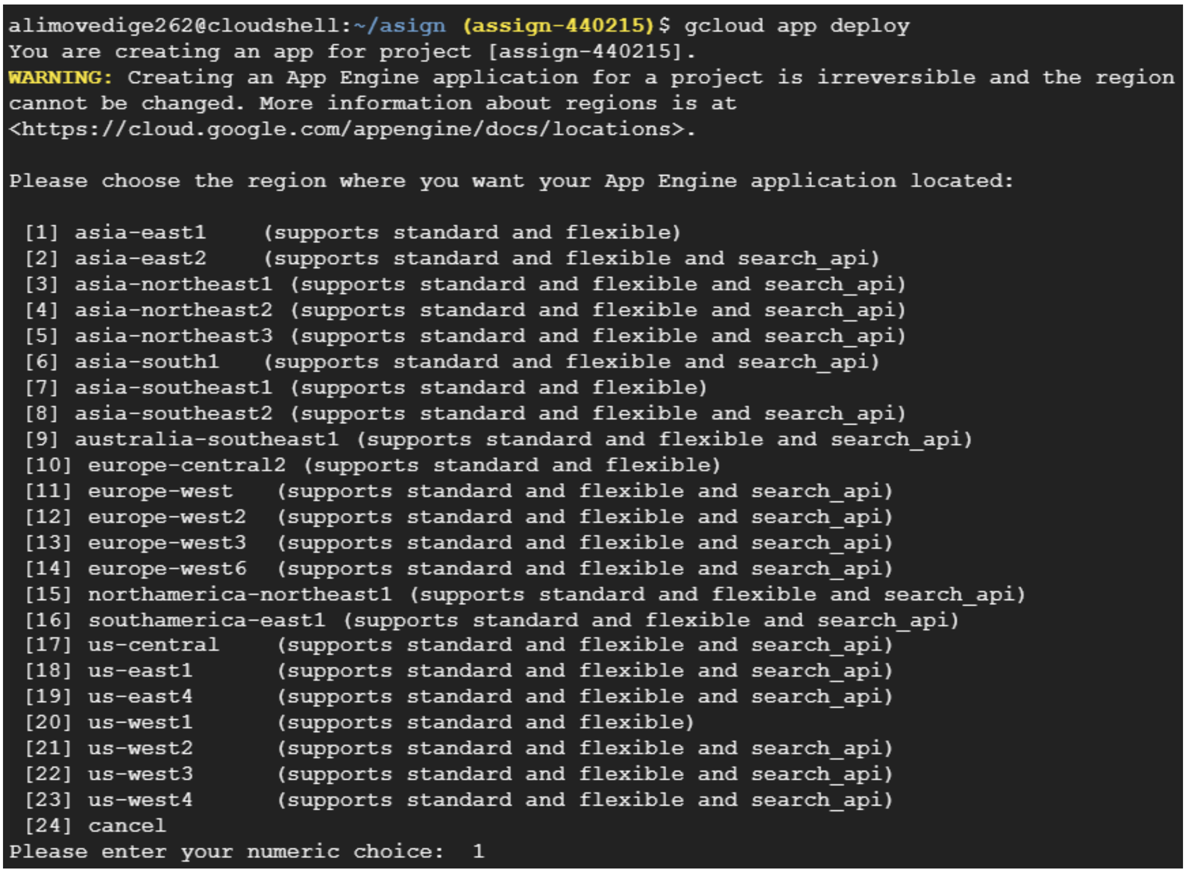
```
alimovedige262@cloudshell:~/asign (assign-440215)$ gcloud endpoints services deploy openapi.yaml
Waiting for async operation operations/services.assign-440215.appspot.com-0 to complete...
ERROR: (gcloud.endpoints.services.deploy) INVALID_ARGUMENT: Cannot convert to service config.
'location: "unknown location"
kind: ERROR
message: "Invalid OpenAPI file. Please fix the schema errors:\nerror: instance failed to match ex
://swagger.io/v2/schema.json#\",\"pointer\":\"/definitions/responseValue\"}\n    instance: {\"poi
neOf\"\n    matched: 0\n    nrSchemas: 2\n    reports: {\"/definitions/responseValue/oneOf/0\":[{
":\"/definitions/response\"},\"instance\":{\"pointer\":\"/paths/~1api~1hello/get/responses/200\"}
as properties which are not allowed by the schema: [\\\"content\\\"]\",\"unwanted\":[\"content\"]
tp://swagger.io/v2/schema.json#\",\"pointer\":\"/definitions/jsonReference\"},\"instance\":{\"poi
ionalProperties\",\"message\":\"object instance has properties which are not allowed by the schem
\":\"error\",\"schema\":{\"loadingURI\":\"http://swagger.io/v2/schema.json#\",\"pointer\":\"/defi
"domain\":\"validation\",\"keyword\":\"required\",\"message\":\"object has missing required prope
'
```

In second time I change my openapi.yaml code so it works.



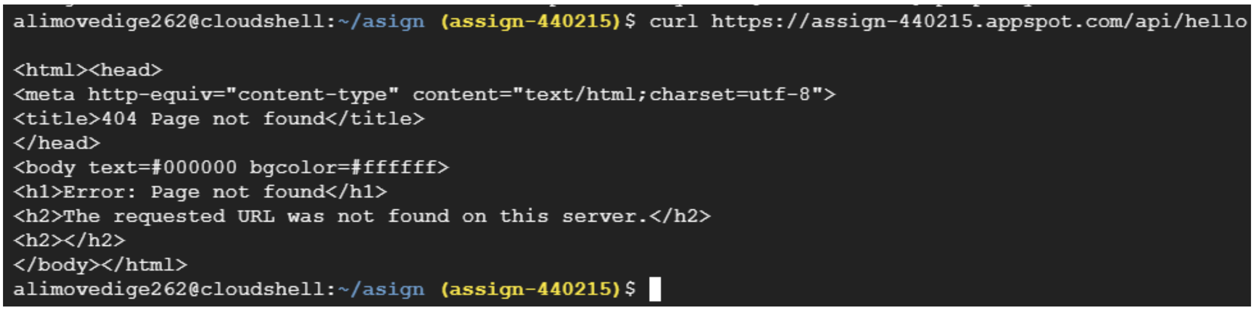
```
alimovedige262@cloudshell:~/asign (assign-440215)$ gcloud endpoints services deploy openapi.yaml
Waiting for async operation operations/serviceConfigs.assign-440215.appspot.com:a744f93e-9729-4700-9609-2d2a7c574b19 to complete...
Operation finished successfully. The following command can describe the Operation details:
 gcloud endpoints operations describe operations/serviceConfigs.assign-440215.appspot.com:a744f93e-9729-4700-9609-2d2a7c574b19

WARNING: openapi.yaml: Operation 'get' in path '/airportName': Operation does not require an API key; callers may invoke the method wit
nable API key all the SecurityRequirement Objects (https://github.com/OAI/OpenAPI-Specification/blob/master/versions/2.0.md#security-re
ce at least one SecurityDefinition of type : 'apiKey'.

Waiting for async operation operations/rollouts.assign-440215.appspot.com:2a17a430-bfa5-43b7-9eda-51fe8e2d7a74 to complete...
Operation finished successfully. The following command can describe the Operation details:
 gcloud endpoints operations describe operations/rollouts.assign-440215.appspot.com:2a17a430-bfa5-43b7-9eda-51fe8e2d7a74

Service Configuration [2024-10-30r0] uploaded for service [assign-440215.appspot.com]

To manage your API, go to: https://console.cloud.google.com/endpoints/api/assign-440215.appspot.com/overview?project=assign-440215
```

5) I use the following command to deploy my application



```
alimovedige262@cloudshell:~/asign (assign-440215)$ gcloud app deploy
You are creating an app for project [assign-440215].
WARNING: Creating an App Engine application for a project is irreversible and the region
cannot be changed. More information about regions is at
<https://cloud.google.com/appengine/docs/locations>.

Please choose the region where you want your App Engine application located:

 [1] asia-east1    (supports standard and flexible)
 [2] asia-east2    (supports standard and flexible and search_api)
 [3] asia-northeast1 (supports standard and flexible and search_api)
 [4] asia-northeast2 (supports standard and flexible and search_api)
 [5] asia-northeast3 (supports standard and flexible and search_api)
 [6] asia-south1   (supports standard and flexible and search_api)
 [7] asia-southeast1 (supports standard and flexible)
 [8] asia-southeast2 (supports standard and flexible and search_api)
 [9] australia-southeast1 (supports standard and flexible and search_api)
 [10] europe-central2 (supports standard and flexible)
 [11] europe-west    (supports standard and flexible and search_api)
 [12] europe-west2   (supports standard and flexible and search_api)
 [13] europe-west3   (supports standard and flexible and search_api)
 [14] europe-west6   (supports standard and flexible and search_api)
 [15] northamerica-northeast1 (supports standard and flexible and search_api)
 [16] southamerica-east1 (supports standard and flexible and search_api)
 [17] us-central     (supports standard and flexible and search_api)
 [18] us-east1       (supports standard and flexible and search_api)
 [19] us-east4       (supports standard and flexible and search_api)
 [20] us-west1       (supports standard and flexible)
 [21] us-west2       (supports standard and flexible and search_api)
 [22] us-west3       (supports standard and flexible and search_api)
 [23] us-west4       (supports standard and flexible and search_api)
 [24] cancel
Please enter your numeric choice:  1
```

6) Use “curl” for testing

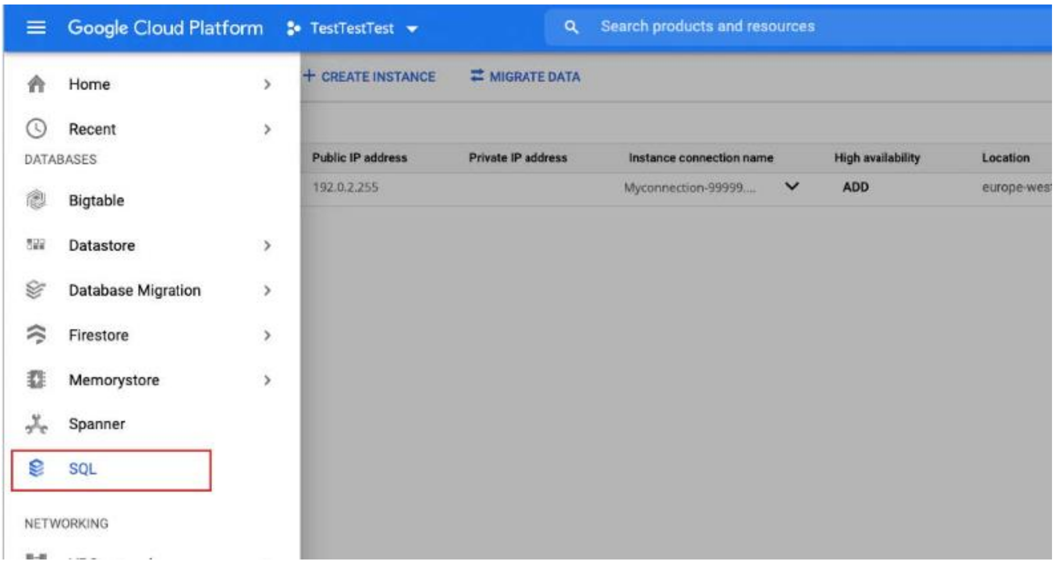


```
alimovedige262@cloudshell:~/asign (assign-440215)$ curl https://assign-440215.appspot.com/api/hello

<html><head>
<meta http-equiv="content-type" content="text/html;charset=utf-8">
<title>404 Page not found</title>
</head>
<body text=#000000 bgcolor=#ffffff>
<h1>Error: Page not found</h1>
<h2>The requested URL was not found on this server.</h2>
<h2></h2>
</body></html>
alimovedige262@cloudshell:~/asign (assign-440215)$ 
```

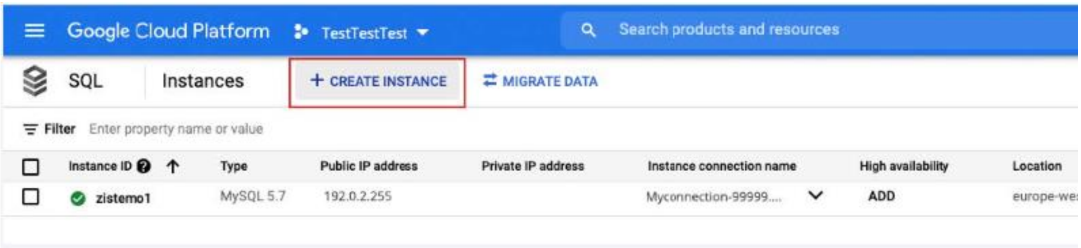
In the response, I must see a JSON object with the message {"message": "Hello, World!"}.

Exercise 2.

1) Navigate to the Google Cloud Console and create a new Cloud SQL instance.

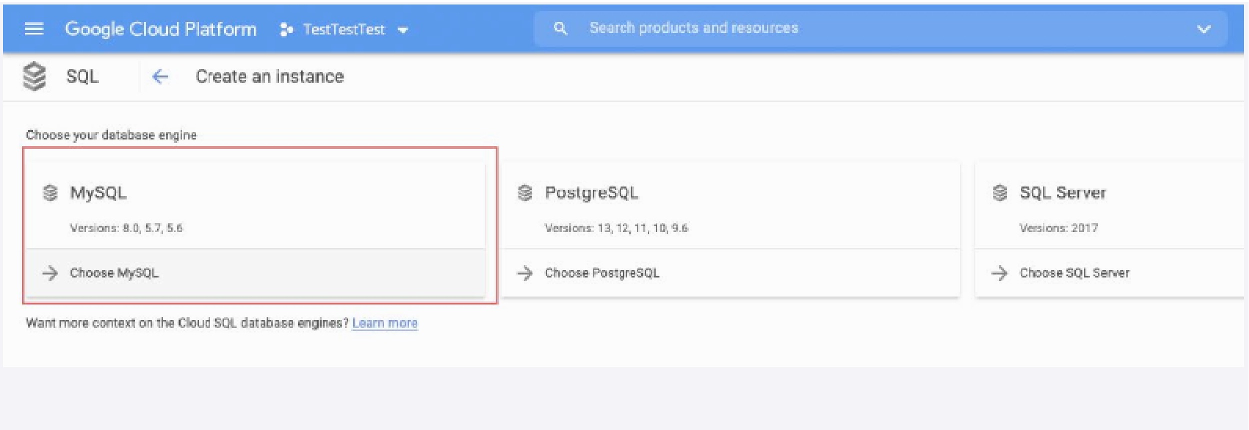


Public IP address	Private IP address	Instance connection name	High availability	Location
192.0.2.255		Myconnection-99999....	ADD	europe-west



□	Instance ID	Type	Public IP address	Private IP address	Instance connection name	High availability	Location
□	✓ zistemo1	MySQL 5.7	192.0.2.255		Myconnection-99999....	ADD	europe-we

2) Choose MySQL, PostgreSQL, or SQL Server as the database type

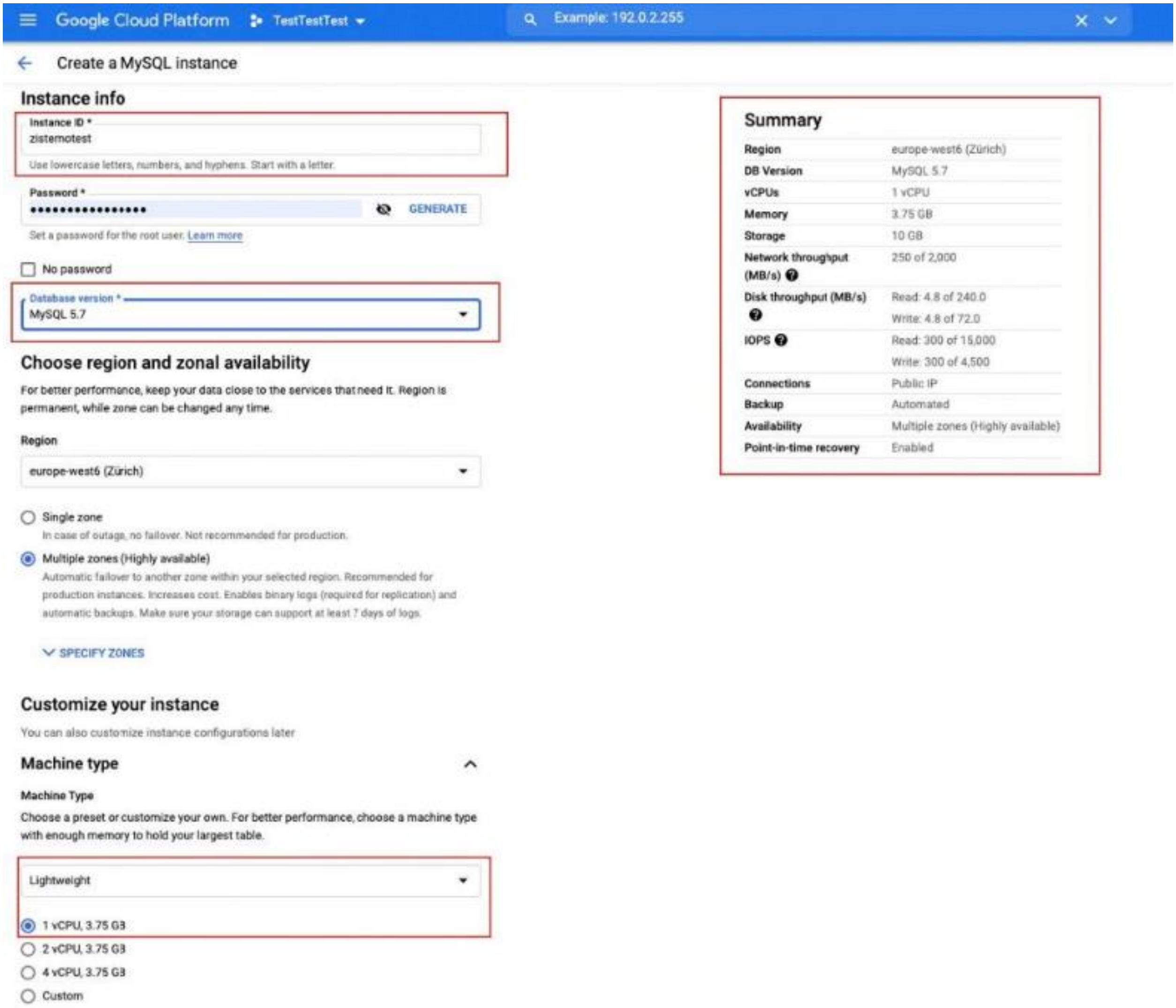


Choose your database engine

MySQL	PostgreSQL	SQL Server
Versions: 8.0, 5.7, 5.6	Versions: 13, 12, 11, 10, 9.6	Versions: 2017
→ Choose MySQL	→ Choose PostgreSQL	→ Choose SQL Server

Want more context on the Cloud SQL database engines? Learn more

3) Configure the instance settings (region, machine type, etc.)



Create a MySQL instance

Instance info

Instance ID *
zistemotest
Use lowercase letters, numbers, and hyphens. Start with a letter.

Password *
••••••••••••••••
GENERATE
Set a password for the root user. Learn more

□ No password

Database version *
MySQL 5.7

Choose region and zonal availability

For better performance, keep your data close to the services that need it. Region is permanent, while zone can be changed any time.

Region
europe-west6 (Zürich)

○ Single zone
In case of outage, no failover. Not recommended for production.

● Multiple zones (Highly available)
Automatic failover to another zone within your selected region. Recommended for production instances. Increases cost. Enables binary logs (required for replication) and automatic backups. Make sure your storage can support at least 7 days of logs.

SPECIFY ZONES

Customize your instance

You can also customize instance configurations later

Machine type

Machine Type
Choose a preset or customize your own. For better performance, choose a machine type with enough memory to hold your largest table.

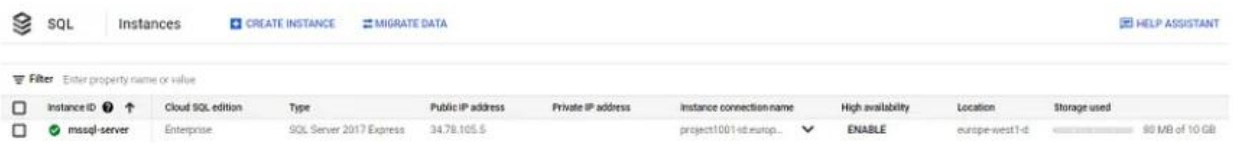
Lightweight

● 1 vCPU, 3.75 GB
○ 2 vCPU, 3.75 GB
○ 4 vCPU, 3.75 GB
○ Custom

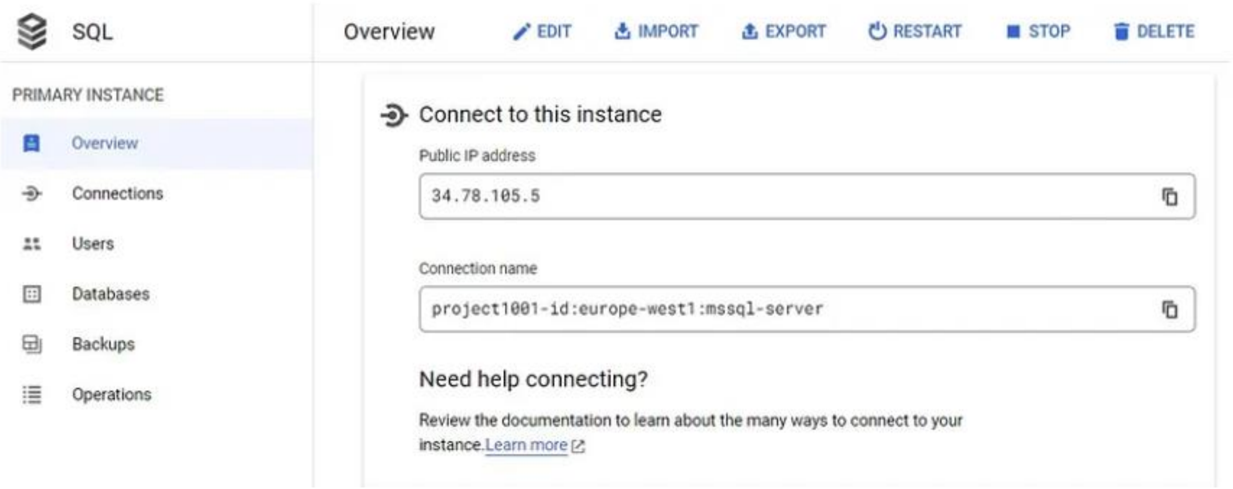
Summary

Region	europe-west6 (Zürich)
DB Version	MySQL 5.7
vCPUs	1 vCPU
Memory	3.75 GB
Storage	10 GB
Network throughput (MB/s)	250 of 2,000
Disk throughput (MB/s)	Read: 4.8 of 240.0 Write: 4.8 of 72.0
IOPS	Read: 300 of 15,000 Write: 300 of 4,500
Connections	Public IP
Backup	Automated
Availability	Multiple zones (Highly available)
Point-in-time recovery	Enabled

4) Connect to your Cloud SQL instance using the Cloud SQL client or mysql command-line tool



□	Instance ID	Cloud SQL edition	Type	Public IP address	Private IP address	Instance connection name	High availability	Location	Storage used
□	✓ mssql-server	Enterprise	SQL Server 2017 Express	34.78.105.5		project1001-id:europ...	ENABLE	europe-west1-d	80 MB of 10 GB



Connect to this instance

Public IP address: 34.78.105.5

Connection name: project1001-id:europe-west1:mssql-server

Need help connecting?

Review the documentation to learn about the many ways to connect to your instance.Learn more

5) Create database with using this code

```
CREATE DATABASE sample_db;
USE sample_db;
CREATE TABLE users (
  id INT AUTO_INCREMENT PRIMARY KEY,
  name VARCHAR(100) NOT NULL,
  email VARCHAR(100) NOT NULL
);
INSERT INTO users (name, email) VALUES ('Alice', 'alice@example.com');
```

The CREATE DATABASE statement creates a new database named sample_db.

The USE statement selects the sample_db database for subsequent operations.

The CREATE TABLE statement creates a new table named users with columns for id, name, and email.

The INSERT INTO statements add two rows of data to the users table, one for Alice and one for Bob.

6) Create a connection to the Cloud SQL instance from a Python application

```
import mysql.connector
cnx = mysql.connector.connect(
    user='your-username',
    password='your-password',
    host='your-cloud-sql-instance-ip',
    database='sample_db')
cursor = cnx.cursor()
cursor.execute('SELECT * FROM users')
for row in cursor:
    print(row)
cursor.close()
cnx.close()
```

code is used to connect to a MySQL database, execute a query to retrieve data from a table, and print the results

If the users table contains the following data

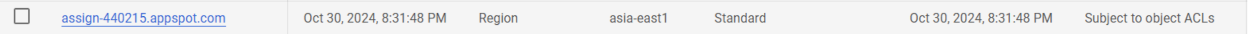
id	name	email
1	Alice	alice@example.com
2	Bob	bob@example.com

The output will be

(1, 'Alice', 'alice@example.com') (2, 'Bob', 'bob@example.com')

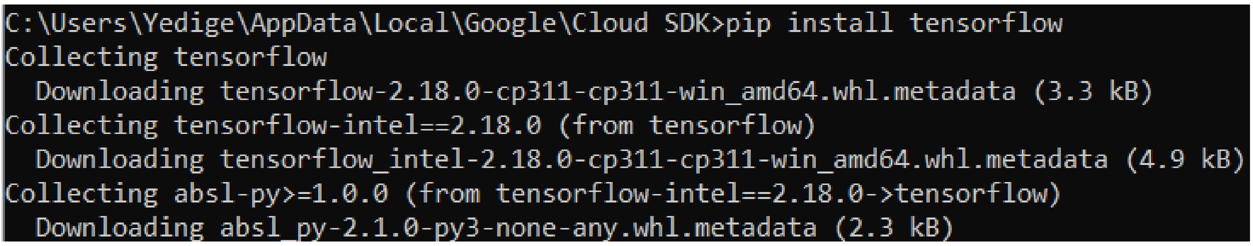
Exercise 3

1) Create a new Cloud Storage bucket to store your training data and model.



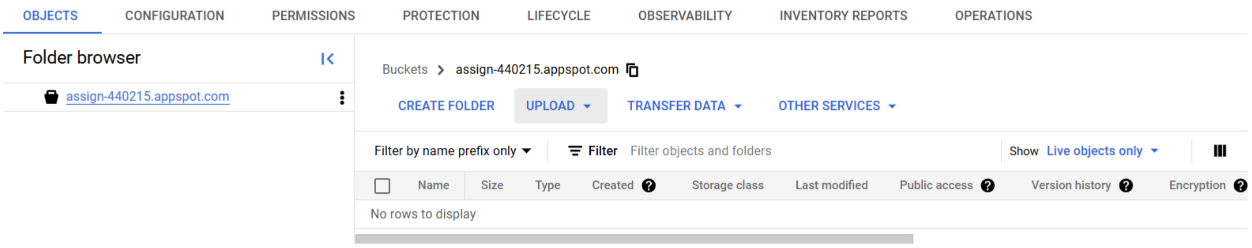
□	assign-440215.appspot.com	Oct 30, 2024, 8:31:48 PM	Region	asia-east1	Standard	Oct 30, 2024, 8:31:48 PM	Subject to object ACLs

2) Install the Google Cloud SDK and TensorFlow.



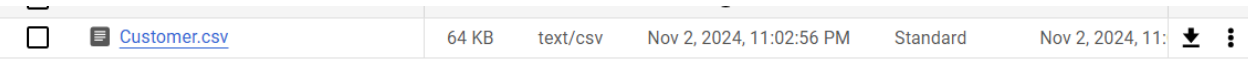
```
C:\Users\Yedige\AppData\Local\Google\Cloud SDK>pip install tensorflow
Collecting tensorflow
  Downloading tensorflow-2.18.0-cp311-cp311-win_amd64.whl.metadata (3.3 kB)
Collecting tensorflow-intel==2.18.0 (from tensorflow)
  Downloading tensorflow_intel-2.18.0-cp311-cp311-win_amd64.whl.metadata (4.9 kB)
Collecting absl-py>=1.0.0 (from tensorflow-intel==2.18.0->tensorflow)
  Downloading absl_py-2.1.0-py3-none-any.whl.metadata (2.3 kB)
```

3) Upload sample training data to your Cloud Storage bucket. For example, use a dataset for classification or regression



□	Name	Size	Type	Created	Storage class	Last modified	Public access	Version history	Encryption

No rows to display



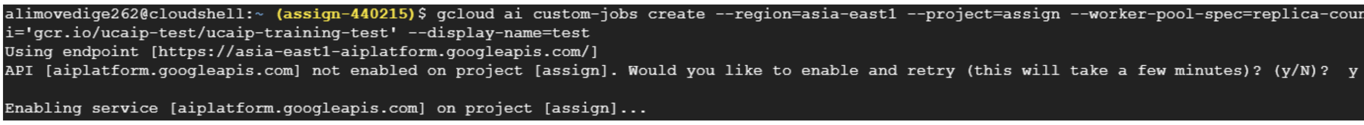
□	Customer.csv	64 KB	text/csv	Nov 2, 2024, 11:02:56 PM	Standard	Nov 2, 2024, 11:

4) Python using the TensorFlow code is designed to create, train, and save a simple machine learning model.

```
import tensorflow as tf
def create_model():
    model = tf.keras.Sequential([
        tf.keras.layers.Dense(10, activation='relu', input_shape=(784,)),
        tf.keras.layers.Dense(10, activation='softmax')
    ])
    model.compile(optimizer='adam', loss='sparse_categorical_crossentropy', metrics=['accuracy'])
    return model
def main():
    model = create_model()
    train_data = tf.data.Dataset.from_tensor_slices((X_train, y_train)).batch(32)
    model.fit(train_data, epochs=5)
    model.save('gs://your-bucket/model')
if __name__ == '__main__':
    main()
```

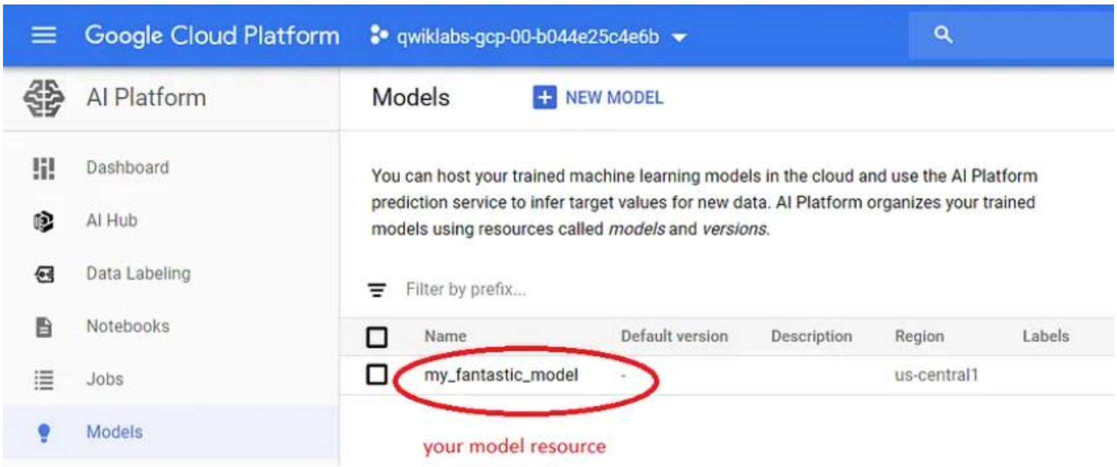
5) Submit and deploy a training job to Google Cloud AI Platform using this code and replacing your-region, your-bucket and other parameters with your values: asia-east1/ assign-440215.appspot.com

```
gcloud ai custom-jobs create --region=your-region --display-name=ml-job --python-package-uris=gs://your-bucket/train.py --python-module=train --container-image-uri=gcr.io/cloud-aiplatform/training/tf-cpu.2-4:latest
```



```
alimovedige262@cloudshell:~ (assign-440215)$ gcloud ai custom-jobs create --region=asia-east1 --project=assign --worker-pool-spec=replica-coun
i='gcr.io/ucaip-test/ucaip-training-test' --display-name=test
Using endpoint [https://asia-east1-aiplatform.googleapis.com/]
API [aiplatform.googleapis.com] not enabled on project [assign]. Would you like to enable and retry (this will take a few minutes)? (y/N)?  y

Enabling service [aiplatform.googleapis.com] on project [assign]...
```

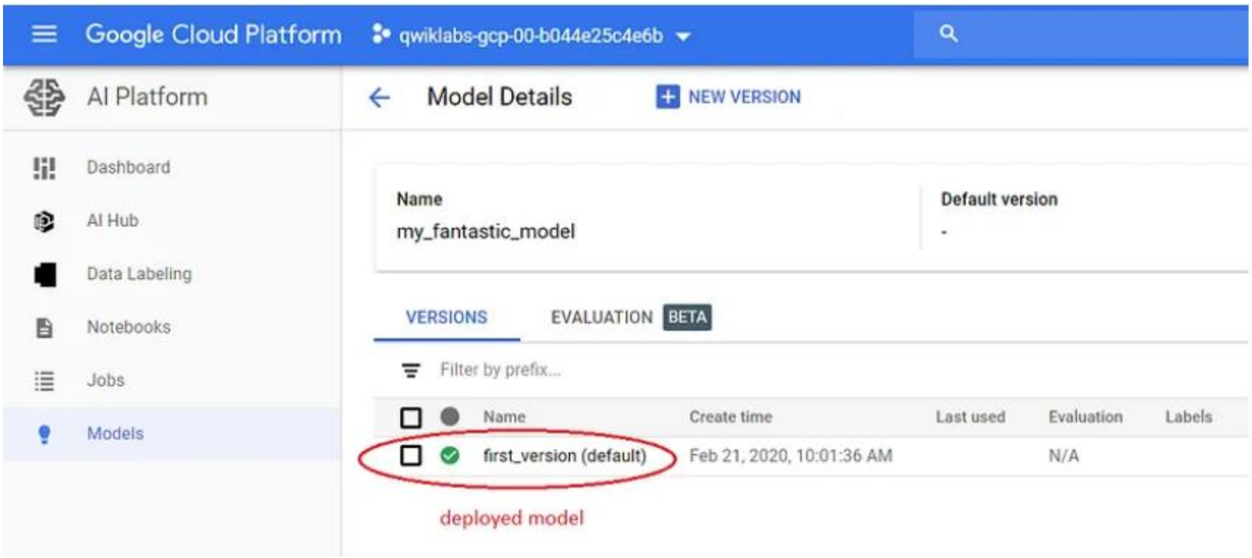
Expected outcome:



You can host your trained machine learning models in the cloud and use the AI Platform prediction service to infer target values for new data. AI Platform organizes your trained models using resources called *models* and *versions*.

□	Name	Default version	Description	Region	Labels
□	my_fantastic_model	-		us-central1	

your model resource



Name
my_fantastic_model

Default version
-

□	●	Name	Create time	Last used	Evaluation	Labels
□	✓	first_version (default)	Feb 21, 2020, 10:01:36 AM		N/A	

deployed model

6) Use the deployed model endpoint to make testing and predictions.

```
from google.cloud import aiplatform
def predict():
    client = aiplatform.gapic.PredictionServiceClient()
    endpoint = client.endpoint_path(project='your-project', location='your-region', endpoint='your-endpoint-id')
    instance = {'input': [/* your data */]}
    response = client.predict(endpoint=endpoint, instances=[instance])
    print(response.predictions)
if __name__ == '__main__':
    predict()
```