

Collaborated with James Wong
Bryce Hiraoka

HW 6

- First I added my python file to a bucket so that it could be run on a VM

← Create a bucket

✓ Name your bucket

Name: hw6-vm-bucket

✓ Choose where to store your data

Location: us (multiple regions in United States)
Location type: Multi-region

✓ Choose a storage class for your data

Default storage class: Standard

✓ Choose how to control access to objects

Public access prevention: On
Access control: Uniform

• Choose how to protect object data

Your data is always protected with Cloud Storage but you can also choose from these additional data protection options to prevent data loss. Note that object versioning and retention policies cannot be used together.

Protection tools

☒ None

☐ Object versioning (for data recovery)
For restoring deleted or overwritten objects. To minimize the cost of storing versions, we recommend limiting the number of noncurrent versions per object and scheduling them to expire after a number of days. [Learn more](#)

☐ Retention policy (for compliance)
For preventing the deletion or modification of the bucket's objects for a specified minimum duration of time after being uploaded. [Learn more](#)

DATA ENCRYPTION

CREATE

CANCEL

Good to know

Location pricing

Storage rates vary depending on the storage class of your data and location of your bucket. [Pricing details](#)

Current configuration: Multi-region / Standard

Item	Cost
us (multiple regions in United States)	\$0.026 per GB-month
With default replication	\$0.020 per GB written

ESTIMATE YOUR MONTHLY COST

← Bucket details

REFRESH

LEARN

hw6-vm-bucket

Location

us (multiple regions in United States)

Storage class

Standard

Public access

Not public

Protection

None

OBJECTS

CONFIGURATION

PERMISSIONS

PROTECTION

LIFECYCLE

OBSERVABILITY

INVENTORY REPORTS

Buckets > hw6-vm-bucket

UPLOAD FILES

UPLOAD FOLDER

CREATE FOLDER

TRANSFER DATA

MANAGE HOLDS

DOWNLOAD

DELETE

Filter by name prefix only

Filter Filter objects and folders

Show deleted data

	Name	Size	Type	Created	Storage class	Last modified	Public access	Version history	En
<input type="checkbox"/>	model1.py	1.1 KB	text/x-python-script	Nov 6, 2023, 10:12:48 PM	Standard	Nov 6, 2023, 10:12:48 PM	Not public	—	Gc

- Next I creates a VM to run the python file

hw6-vm [EDIT](#) [RESET](#) [+ CREATE MACHINE IMAGE](#) [CREATE SIMILAR](#) [▶ START / RESUME](#) [OPERATIONS](#)

DETAILS OBSERVABILITY OS INFO SCREENSHOT

[SSH](#) [CONNECT TO SERIAL CONSOLE](#)

Connecting to serial ports is disabled [?](#)

Logs

[Logging](#)
[Serial port 1 \(console\)](#)
[SHOW MORE](#)

Basic information

Name	hw6-vm
Instance Id	5763111795235755144
Description	None
Type	Instance
Status	Running
Creation time	Nov 6, 2023, 10:09:28 PM UTC-05:00
Zone	us-central1-a
Instance template	None
In use by	None
Reservations	Automatically choose
Labels	None
Tags ?	—
Deletion protection	Disabled
Confidential VM service ?	Disabled
Preserved state size	0 GB

- I then SSH into the vm and run

```
1. if [ -d "/home/bhiraoka/hw6-vm-bucket/model1.py" ]; then
    echo "Directory /home/bhiraoka/hw5-vm-bucket/Web-server exists"
else
    gsutil -m cp -r gs://hw6-vm-bucket/ /home/bhiraoka/
fi
2. cd /home/bhiraoka/hw6-vm-bucket
3. sudo apt install python3-pip -y
4. pip install cloud-sql-python-connector==0.9.3
5. pip install PyMySQL
6. pip install pandas
7. pip install -U scikit-learn
8. python3 model1.py
9. Python3 model2.py
```

- This is the accuracy of my first model

```

Installing collected packages: PyMySQL
Successfully installed PyMySQL-1.1.0
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 % python3 model1.py ]
Your instance connection name is: ds-561-398918:us-east1:hw5-database
/Users/brycehiraoka/Desktop/DS_561_2/6-HW-DS561/model1.py:24: UserWarning: pandas
s only supports SQLAlchemy connectable (engine/connection) or database string UR
I or sqlite3 DBAPI2 connection. Other DBAPI2 objects are not tested. Please cons
ider using SQLAlchemy.
  df = pd.read_sql(query, con=conn)
Model accuracy: 0.9964363774588996
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 %

```

- For my second model I was not able to get the accuracy to be the 80% I could only get my code to get up to 20%. I tried every combination of inputs to outputs but none of them worked.
- I analyzed the http client that creates the income and I found that the income is chosen randomly using the random.randrange(). I know from previous classes that random is not truly random and it is based off of system time. This is why my first thought was to use the timestamp and correlate it to the income.

1. This is the result when I used TimeStamp compared to Income

```

/Users/brycehiraoka/Desktop/DS_561_2/6-HW-DS561/model2.py:24: UserWarning: pandas only supports SQLAlchemy connectable (engine/connection) or database string URI or sqlite3 DBAPI2 connection. Other DBAPI2
objects are not tested. Please consider using SQLAlchemy.
  data = pd.read_sql(query, con=conn)
Model accuracy: 0.13061864487313504
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 %

```

- I then realized that both Gender and Age use the same random.randrange() so I tried to use all or them correlated with the income.
- #### 2. This is the result when I compared TimeStamp, Age, Gender to Income

```

(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 % python3 model2.py
Your instance connection name is: ds-561-398918:us-east1:hw5-database
/Users/brycehiraoka/Desktop/DS_561_2/6-HW-DS561/model2.py:24: UserWarning: pandas only supports SQLAlchemy connectable (engine/connection) or database string URI or sqlite3 DBAPI2 connection. Other DBAPI2
objects are not tested. Please consider using SQLAlchemy.
  data = pd.read_sql(query, con=conn)
Model accuracy: 0.12534448351230637
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 %

```

- At this point nothing was working so I just compared random columns to income
- #### 3. This is the result when I use Country, TimeStamp, Gender, Age compared to Income

```

(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 % python3 model2.py
Your instance connection name is: ds-561-398918:us-east1:hw5-database
/Users/brycehiraoka/Desktop/DS_561_2/6-HW-DS561/model2.py:24: UserWarning: pandas only supports SQLAlchemy connectable (engine/connection) or database string URI or sqlite3 DBAPI2 connection. Other DBAPI2
objects are not tested. Please consider using SQLAlchemy.
  data = pd.read_sql(query, con=conn)
Model accuracy: 0.12724580220809328
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 %

```

4. This is the result when I use Country compared to Income

```

(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 % python3 model2.py
Your instance connection name is: ds-561-398918:us-east1:hw5-database
/Users/brycehiraoka/Desktop/DS_561_2/6-HW-DS561/model2.py:24: UserWarning: pandas only supports SQLAlchemy connectable (engine/connection) or database string URI or sqlite3 DBAPI2 connection. Other DBAPI2
objects are not tested. Please consider using SQLAlchemy.
  data = pd.read_sql(query, con=conn)
Model accuracy: 0.12762520193861066
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 %

```

5. This is the result when I use Country, Age, Gender to Income

```

(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 % python3 model2.py
Your instance connection name is: ds-561-398918:us-east1:hw5-database
/Users/brycehiraoka/Desktop/DS_561_2/6-HW-DS561/model2.py:24: UserWarning: pandas only supports SQLAlchemy connectable (engine/connection) or database string URI or sqlite3 DBAPI2 connection. Other DBAPI2
objects are not tested. Please consider using SQLAlchemy.
  data = pd.read_sql(query, con=conn)
Model accuracy: 0.12867053121733346
(base) brycehiraoka@crc-dot1x-nat-10-239-9-185 6-HW-DS561 %

```

- At this point I could not get it to be above 13% so I am guessing that my model idea does not work however I could not get any other model to even return an input. I will try more models and turn in late if I figure it out.

I started at \$167 and ended at \$165 so I spent \$2 while working on this project

Git repository https://github.com/Bryce-Hiraoka/DS_561/tree/main/6-HW-DS561