

# DS561-HW6

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Github Link:

<https://github.com/tigeryi1998/ds561-tigeryi/tree/main/hw6>

## 0. SQL Database “dbhw5” from HW5

<https://console.cloud.google.com/sql/instances/instance-tigeryi/overview?project=feisty-gasket-398719>

Public IP address

34.138.218.160

```
DB_NAME = "dbhw5"
INSTANCE_CONNECTION_NAME = "feisty-gasket-398719:us-east1:instance-tigeryi"
```

Add the following tables into the database in the following schemas:

table1

(successful requests)

Primary Key (ip, time\_of\_day)

ip	time_of_day	filename
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table2

(ip metadata)

Primary Key (ip)

ip	gender	age	income	country	is_banned
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table3

(failed requests)

Primary Key

ip	time_of_day	filename	error
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## 1. model1 (ip, country)

```
stmt = sqlalchemy.text
("""
SELECT (ip, country)
FROM table2;
""")
result1 = db.execute(stmt).fetch_all()
```

result1

ip	country
192.168.1.1	United States of America (USA)

Now we encode string to long and int as the model input

```
def ip2long(ip):
    packedIP = socket.inet_aton(ip)
    return struct.unpack('!L', packedIP)[0]
```

result1

ip	country
3232235777	145

$y = f(x)$   
country = function (ip)

Model is linear support vector machine SVM using SGD

```
model = sklearn.linear_model.SGDClassifier
model.fit(X,y)
```

## 2. model2 (income, gender, age, country)

```
stmt = sqlalchemy.text
("""
SELECT (ip, country)
FROM table2;
""")
result2 = db.execute(stmt).fetch_all()
```

result2

gender	age	income	country
Female	26-35	60k-100k	Italy

Again encode the categorical string into categorical int as the model input

result2

gender	age	income	country
1	2	4	27

```
y = f(x1, x2, x3) ; X = [x1, x2, x3]
income = function (gender, age, country)
```

Model is linear support vector machine SVM using SGD

```
model = sklearn.linear_model.SGDClassifier
model.fit(X,y)
```