assignment5

March 4, 2024

[1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
C:\Users\aakas\AppData\Local\Temp\ipykernel_13864\555797462.py:1:
DeprecationWarning:
Pyarrow will become a required dependency of pandas in the next major release of
pandas (pandas 3.0),
(to allow more performant data types, such as the Arrow string type, and better
interoperability with other libraries)
but was not found to be installed on your system.
If this would cause problems for you,
please provide us feedback at https://github.com/pandas-dev/pandas/issues/54466

  import pandas as pd
```

[2]:
```
network = pd.read_csv("assignment5-dataset.csv")
```

[5]:
```
network.head()
```

[5]:
```
    User ID  Gender  Age  EstimatedSalary  Purchased
0  15624510    Male   19            19000          0
1  15810944    Male   35            20000          0
2  15668575  Female   26            43000          0
3  15603246  Female   27            57000          0
4  15804002    Male   19            76000          0
```

[3]:
```
network.replace("?", np.nan, inplace=True)
```

[4]:
```
network.isnull().sum()
```

[4]:
```
User ID            0
Gender             0
Age                0
EstimatedSalary    0
Purchased          0
dtype: int64
```

```
[10]: network["Gender"].replace("Male", 0, inplace=True)
      network["Gender"].replace("Female", 1, inplace=True)
```

```
C:\Users\aakas\AppData\Local\Temp\ipykernel_13864\632014200.py:2: FutureWarning:
Downcasting behavior in `replace` is deprecated and will be removed in a future
version. To retain the old behavior, explicitly call
`result.infer_objects(copy=False)`. To opt-in to the future behavior, set
`pd.set_option('future.no_silent_downcasting', True)`
  network["Gender"].replace("Female", 1, inplace=True)
```

```
[11]: network.head()
```

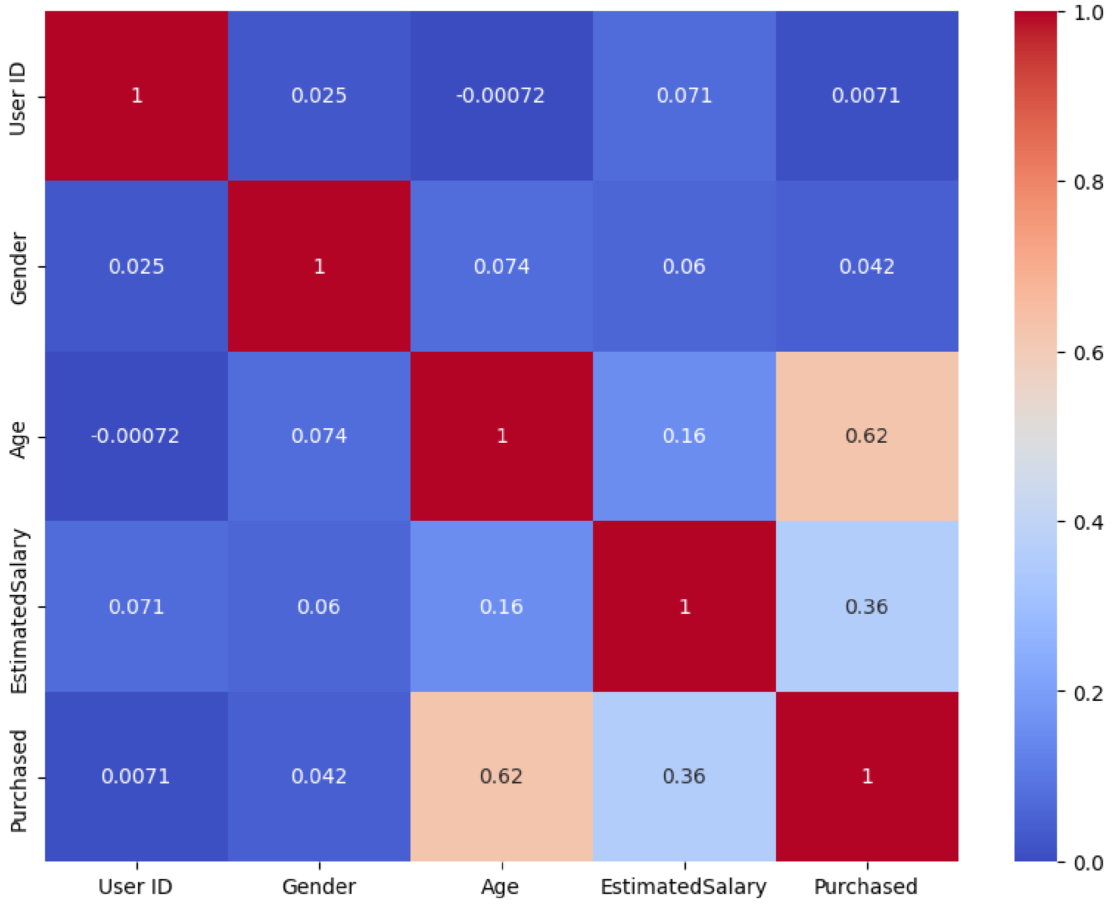
```
[11]:     User ID  Gender  Age  EstimatedSalary  Purchased
      0  15624510       0   19            19000          0
      1  15810944       0   35            20000          0
      2  15668575       1   26            43000          0
      3  15603246       1   27            57000          0
      4  15804002       0   19            76000          0
```

```
[13]: correlation = network.corr()
      correlation
```

```
[13]:                   User ID    Gender       Age  EstimatedSalary  Purchased
      User ID          1.000000  0.025249 -0.000721         0.071097   0.007120
      Gender           0.025249  1.000000  0.073741         0.060435   0.042469
      Age             -0.000721  0.073741  1.000000         0.155238   0.622454
      EstimatedSalary  0.071097  0.060435  0.155238         1.000000   0.362083
      Purchased        0.007120  0.042469  0.622454         0.362083   1.000000
```

```
[17]: plt.figure(figsize=(10, 7.5))
      sns.heatmap(correlation, annot=True, cmap="coolwarm")
```

```
[17]: <Axes: >
```



[21]:
```
x = network.iloc[:,1:-1]
y = network.iloc[:,-1]
```

[25]:
```
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
```

[41]:
```
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.20,␣
 ↪random_state=0)
```

[42]:
```
from sklearn.preprocessing import StandardScaler
```

[43]:
```
sc = StandardScaler()
x_train = sc.fit_transform(x_train)
x_test = sc.transform(x_test)
```

[44]:
```
model = LogisticRegression(random_state=0)
```

[45]:
```
model.fit(x_train, y_train)
```

```
[45]: LogisticRegression(random_state=0)
```

```
[46]: y_pred = model.predict(x_test)
```

```
[50]: from sklearn.metrics import confusion_matrix, accuracy_score
```

```
[48]: cm = confusion_matrix(y_test, y_pred)
      cm
```

```
[48]: array([[56,  2],
             [ 5, 17]], dtype=int64)
```

```
[49]: log_accuracy = accuracy_score(y_test, y_pred)
      log_accuracy
```

```
[49]: 0.9125
```