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

In [2]:
```python
df = pd.read_csv('customer.csv')
```

In [3]:
```python
df.head()
```

Out[3]:

	gender	age	salary	purchased
0	Male	19	19000	0
1	Male	35	20000	0
2	Female	26	43000	0
3	Female	27	57000	0
4	Male	19	76000	0

In [4]:
```python
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
```

In [29]:
```python
att = df[ ['age','salary']]
label = df['purchased']
att_train ,att_test , class_train , class_test = train_test_split(att,label,random_

scaler = StandardScaler()
scaler.fit(att_train)
att_train[ ['age','salary']] = scaler.transform(att_train)

model = KNeighborsClassifier(n_neighbors = 3)
model.fit(att_train,class_train)

model.score(att_train, class_train )
```

Out[29]:
```
0.925
```

In [31]:
```python
result = pd.concat([att_train,class_train],axis = 1)
result['predict'] = model.predict(att_train)
result
```

Out[31]:

	age	salary	purchased	predict
92	-1.163172	-1.584970	0	0
223	2.170181	0.930987	1	1
234	0.013305	1.220177	0	1
232	0.209385	1.075582	1	1
377	0.405465	-0.486047	0	0
...	...	...	...	...
323	0.993704	-1.151185	1	1
192	-0.869053	-0.775237	0	0
117	-0.182774	-0.514966	0	0
47	-1.065133	-0.457127	0	0
172	-1.163172	1.393691	0	0

280 rows × 4 columns

In [32]:
```python
class_train
```

Out[32]:
```
92     0
223    1
234    0
232    1
377    0
      ..
323    1
192    0
117    0
47     0
172    0
Name: purchased, Length: 280, dtype: int64
```

In [34]:
```python
model.predict(att_train)
```

Out[34]:
```
array([0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 0, 0,
       0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 1,
       0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 1, 1, 1, 0, 1,
       0, 0, 1, 1, 0, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0,
       1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0, 1, 0, 0, 0,
       1, 0, 1, 1, 0, 1, 0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0, 0, 0, 1, 0,
       0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1,
       1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1, 1, 0, 1, 0, 1, 0,
       0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0,
       0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0,
       0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1,
       0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0,
       0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0], dtype=int64)
```

In [20]:
```python
att = df[ ['age','salary']]
label = df['purchased']
att_train ,att_test , class_train , class_test = train_test_split(att,label,random_

scaler = StandardScaler()
scaler.fit(att_train)
att_train[ ['age','salary']] = scaler.transform(att_train)

model = KNeighborsClassifier(n_neighbors = 10)
```

```
model.fit(att_train,class_train)

model.score(scaler.transform(att_test), class_test )
```

C:\Users\natty\anaconda3\Lib\site-packages\sklearn\base.py:464: UserWarning: X does not have valid feature names, but KNeighborsClassifier was fitted with feature names
  warnings.warn(

Out[20]: 0.925

In [21]:
```
result = pd.concat([att_test,class_test],axis = 1)
result['predict'] = model.predict(scaler.transform(att_test))
result
```

C:\Users\natty\anaconda3\Lib\site-packages\sklearn\base.py:464: UserWarning: X does not have valid feature names, but KNeighborsClassifier was fitted with feature names
  warnings.warn(

Out[21]:

	age	salary	purchased	predict
132	30	87000	0	0
309	38	50000	0	0
341	35	75000	0	0
196	30	79000	0	0
246	35	50000	0	0
...	...	...	...	...
216	49	65000	0	0
259	45	131000	1	1
49	31	89000	0	0
238	46	82000	0	0
343	47	51000	1	1

120 rows × 4 columns

In [33]:
```
class_test
```

Out[33]:
```
132    0
309    0
341    0
196    0
246    0
      ..
216    0
259    1
49     0
238    0
343    1
Name: purchased, Length: 120, dtype: int64
```

In [35]:
```
model.predict(att_test)
```

```
Out[35]:  array([1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
                 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
                 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
                 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
                 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
                 1, 1, 1, 1, 1, 1, 1, 1, 1], dtype=int64)
```

In [ ]: