

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

```
In [29]: 1 data = pd.read_csv("Customer.csv")
```

```
In [30]: 1 data.head()
```

Out[30]:

	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 [31]: 1 data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 400 entries, 0 to 399
Data columns (total 4 columns):
#   Column      Non-Null Count  Dtype
---  -
0   gender      400 non-null   object
1   age         400 non-null   int64
2   salary      400 non-null   int64
3   purchased   400 non-null   int64
dtypes: int64(3), object(1)
memory usage: 12.6+ KB
```

```
In [6]: 1 from sklearn.preprocessing import StandardScaler
        2 from sklearn.model_selection import train_test_split
        3 from sklearn.neighbors import KNeighborsClassifier
```

```

In [37]: 1 # first step
          2 att = data[["age", "salary"]]
          3 allclass = data["purchased"]
          4
          5 att_train, att_test, class_train, class_test = train_test_split(att, allcl
          6
          7
          8 #secound step
          9 scaler = StandardScaler()
         10 scaler.fit(att_train)
         11 att_train[["age", "salary"]] = scaler.transform(att_train)
         12
         13 model = KNeighborsClassifier(n_neighbors = 3)
         14 model.fit(att_train, class_train)
         15
         16 # third step
         17 model.score(scaler.transform(att_test), class_test)

```

C:\Users\dekdo\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[37]: 0.9083333333333333

```

In [45]: 1 scaler.inverse_transform(att_train)
          2 # att_train[["age", "salary"]]
          3 [3.00e+01, 1.18e+05],
          4 [4.20e+01, 9.00e+04],
          5 [4.70e+01, 3.00e+04],
          6 [2.60e+01, 4.30e+04],
          7 [4.00e+01, 7.80e+04],
          8 [4.60e+01, 5.90e+04],
          9 [5.90e+01, 4.20e+04],
         10 [4.60e+01, 7.40e+04],
         11 [3.50e+01, 9.10e+04],
         12 [2.80e+01, 5.90e+04],
         13 [4.00e+01, 5.70e+04],
         14 [5.90e+01, 1.43e+05],
         15 [5.70e+01, 2.60e+04],
         16 [5.20e+01, 3.80e+04],
         17 [4.70e+01, 1.13e+05],
         18 [5.30e+01, 1.43e+05],
         19 [3.50e+01, 2.70e+04],
         20 [5.80e+01, 1.01e+05],
         21 [4.50e+01, 4.50e+04],
         22 [2.30e+01, 8.20e+04],
         23 ...

```

In [46]: 1 model.predict(att\_train)

Out[46]: 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, 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, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1,  
1, 0, 1, 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, 1, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0,  
0, 0, 0, 0, 0, 1, 1, 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, 1, 1, 0, 0, 0, 0, 0, 1,  
0, 1, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1,  
0, 1, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0,  
0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0])

In [47]: 1 result = pd.concat([att\_train, class\_train], axis = 1)  
2 result["predict"] = model.predict(att\_train)  
3 result

Out[47]:

	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 [49]: 1 model.predict(scaler.transform([[32, 150000]]))

C:\Users\dekdo\anaconda3\Lib\site-packages\sklearn\base.py:464: UserWarning:  
X does not have valid feature names, but StandardScaler was fitted with feature names

warnings.warn(

C:\Users\dekdo\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[49]: array([1], dtype=int64)

In [ ]:

1	
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