

```
In [10]: import seaborn as sns
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
```

```
In [11]: df = pd.read_csv('apple-orange.csv')  
df
```

Out[11]:

	weight	size	class
0	69	4.39	orange
1	69	4.21	orange
2	65	4.09	orange
3	72	5.85	apple
4	67	4.70	orange
5	73	5.68	apple
6	70	5.56	apple
7	75	5.11	apple
8	74	5.36	apple
9	65	4.27	orange
10	73	5.79	apple
11	70	5.47	apple
12	74	5.53	apple
13	68	4.47	orange
14	74	5.22	apple
15	65	4.48	orange
16	69	4.66	orange
17	75	5.25	apple
18	67	4.18	orange
19	74	5.50	apple
20	66	4.13	orange
21	70	4.83	orange
22	69	4.61	orange
23	68	4.08	orange
24	67	4.25	orange
25	71	5.35	apple
26	67	4.01	orange
27	70	4.22	orange
28	74	5.25	apple
29	71	5.26	apple
30	73	5.78	apple
31	66	4.68	orange
32	72	5.72	apple
33	73	5.17	apple
34	68	4.83	orange
35	69	4.11	orange

	weight	size	class
36	69	4.76	orange
37	74	5.48	apple
38	70	5.59	apple
39	73	5.03	apple

In [12]:

```
att = df[['weight', 'size']]
label = df['class']

att_train, att_test, class_train, class_test = train_test_split(att, label)

scaler = StandardScaler()
scaler.fit(att_train)

att_train[['weight', 'size']] = scaler.transform(att_train)

model = KNeighborsClassifier(n_neighbors=2)
model.fit(att_train, class_train)

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

```
C:\Users\walo1\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[12]: 1.0

```
In [13]: result = pd.concat([att_test, class_test], axis= 1)
result['predict'] = model.predict(scaler.transform(att_test))
result
```

```
C:\Users\walo1\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[13]:

	weight	size	class	predict
22	69	4.61	orange	orange
20	66	4.13	orange	orange
25	71	5.35	apple	apple
4	67	4.70	orange	orange
10	73	5.79	apple	apple
15	65	4.48	orange	orange
28	74	5.25	apple	apple
11	70	5.47	apple	apple
18	67	4.18	orange	orange
29	71	5.26	apple	apple
27	70	4.22	orange	orange
35	69	4.11	orange	orange
37	74	5.48	apple	apple
2	65	4.09	orange	orange
39	73	5.03	apple	apple
30	73	5.78	apple	apple
34	68	4.83	orange	orange
16	69	4.66	orange	orange
36	69	4.76	orange	orange
8	74	5.36	apple	apple
13	68	4.47	orange	orange
5	73	5.68	apple	apple
17	75	5.25	apple	apple
14	74	5.22	apple	apple
33	73	5.17	apple	apple
7	75	5.11	apple	apple
32	72	5.72	apple	apple
1	69	4.21	orange	orange
26	67	4.01	orange	orange
12	74	5.53	apple	apple
31	66	4.68	orange	orange
24	67	4.25	orange	orange

In []:

In []:

In []: