```python
# This Python 3 environment comes with many helpful analytics
libraries installed
# It is defined by the kaggle/python Docker image:
https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/"
directory
# For example, running this (by clicking run or pressing Shift+Enter)
will list all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/)
that gets preserved as output when you create a version using "Save &
Run All"
# You can also write temporary files to /kaggle/temp/, but they won't
be saved outside of the current session
```

/kaggle/input/customer-segmentation-tutorial-in-python/
Mall_Customers.csv

```python
import pandas as pd
import seaborn as s
import numpy as np
from sklearn.cluster import KMeans
import matplotlib.pyplot as plt
from sklearn.preprocessing import StandardScaler

d=pd.read_csv("/kaggle/input/customer-segmentation-tutorial-in-
python/Mall_Customers.csv")
d.head()
df=pd.DataFrame(d)
df.head()
```

	CustomerID	Gender	Age	Annual Income (k$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

```python
X = df[['Annual Income (k$)', 'Spending Score (1-100)']].values
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
wcss = []
for i in range(1, 10):
    kmeans = KMeans(n_clusters=i, random_state=42)
    kmeans.fit(X_scaled)
    wcss.append(kmeans.inertia_)

plt.plot(range(1, 10), wcss)
plt.title("Elbow Method")
plt.xlabel("Number of clusters")
plt.ylabel("WCSS")
plt.show()
```
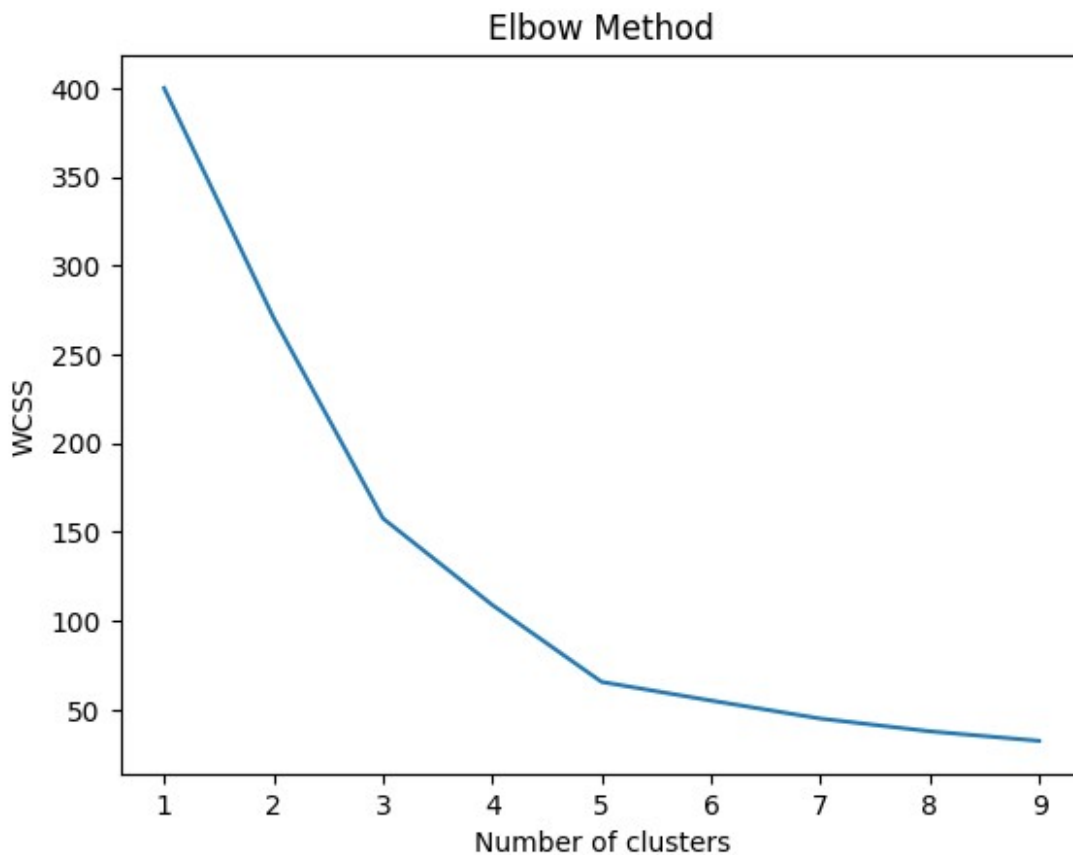
```
/usr/local/lib/python3.11/dist-packages/sklearn/cluster/
_kmeans.py:870: FutureWarning: The default value of `n_init` will
change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly
to suppress the warning
  warnings.warn(
/usr/local/lib/python3.11/dist-packages/sklearn/cluster/_kmeans.py:870
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```


Elbow Method

```
kmeans = KMeans(n_clusters=5, random_state=42)
y_kmeans = kmeans.fit_predict(X_scaled)

plt.scatter(X_scaled[:, 0], X_scaled[:, 1], c=y_kmeans,
cmap='rainbow')
plt.title("Customer Segmentation")
plt.xlabel("Annual Income (scaled)")
plt.ylabel("Spending Score (scaled)")
plt.show()
```

```
/usr/local/lib/python3.11/dist-packages/sklearn/cluster/
_kmeans.py:870: FutureWarning: The default value of `n_init` will
change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly
to suppress the warning
  warnings.warn(
```


Customer Segmentation