```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns


from google.colab import drive
drive.mount('/gdrive')
%cd /gdrive
```

```
Mounted at /gdrive
/gdrive
```

```
cd/gdrive/My Drive/Project dataset external
```

```
/gdrive/My Drive/Project dataset external
```

```
ls
```

```
A_Z_Handwritten_Data.csv  model_hand.h5
Mall_Customers.csv        NSE-Tata-Global-Beverages-Limited.csv
```

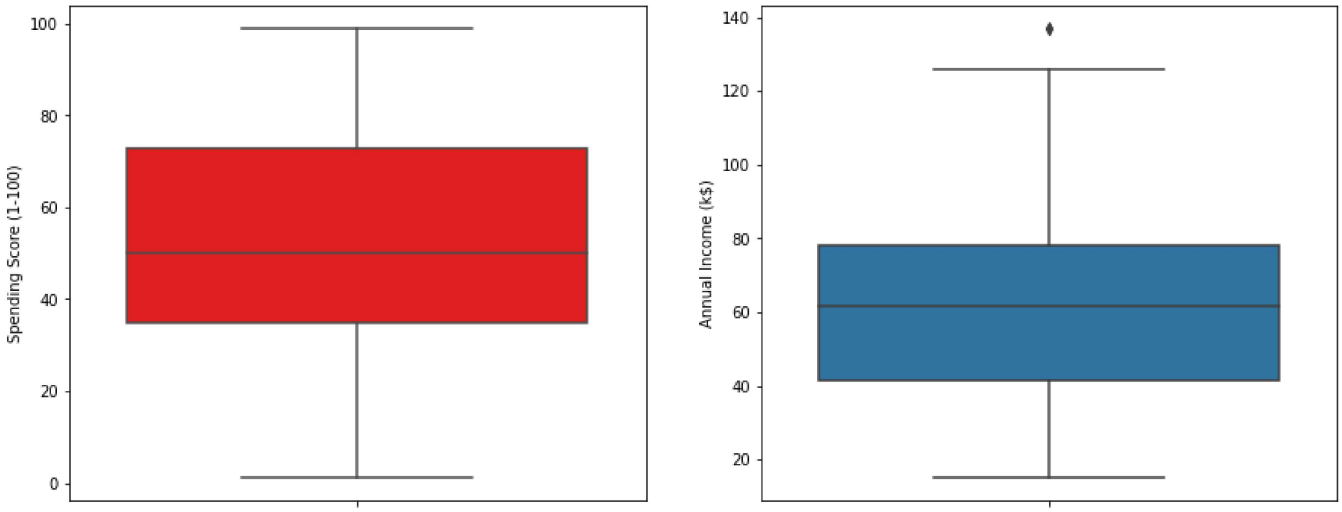
```
!pip install tldextract
import tldextract
```

```
Collecting tldextract
  Downloading https://files.pythonhosted.org/packages/ff/9e/578ea24d0149a5c179ded8ea53e2
     |████████████████████████████████| 92kB 3.6MB/s
Requirement already satisfied: filelock>=3.0.8 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: idna in /usr/local/lib/python3.6/dist-packages (from tlde
Collecting requests-file>=1.4
  Downloading https://files.pythonhosted.org/packages/77/86/cdb5e8eaed90796aa83a6d9f75cf
Requirement already satisfied: requests>=2.1.0 in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (from reque
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.6/dist-packa
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in /usr/local/lib
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.6/dist-packag
Installing collected packages: requests-file, tldextract
Successfully installed requests-file-1.5.1 tldextract-3.0.2
```

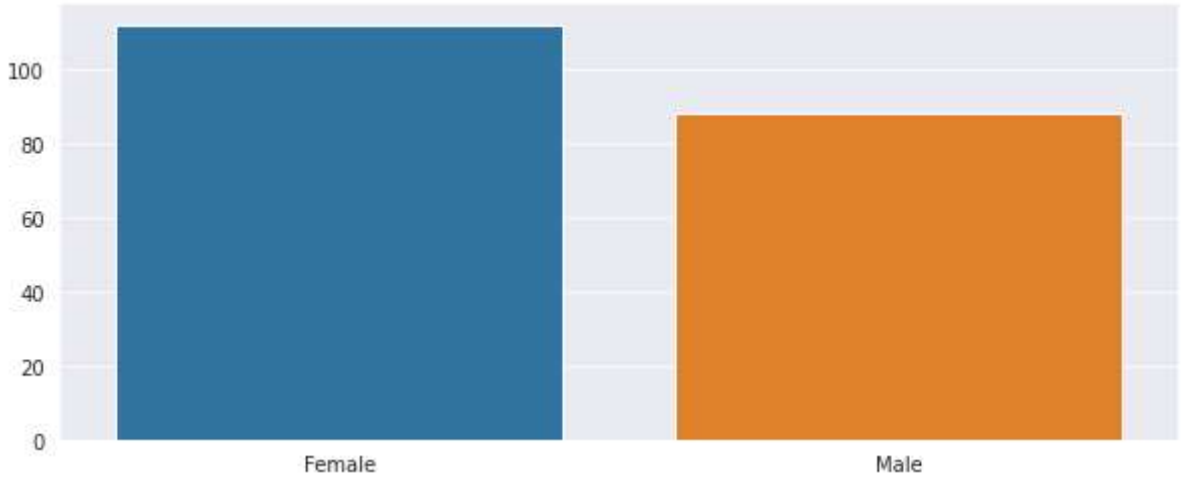
```
data= pd.read_csv('Mall_Customers.csv')
data.head()
```

	CustomerID	Gender	Age	Annual Income (k$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81

```
plt.figure(figsize=(15,6))
plt.subplot(1,2,1)
sns.boxplot(y=data["Spending Score (1-100)"], color="red")
plt.subplot(1,2,2)
sns.boxplot(y=data["Annual Income (k$)"])
plt.show()
```



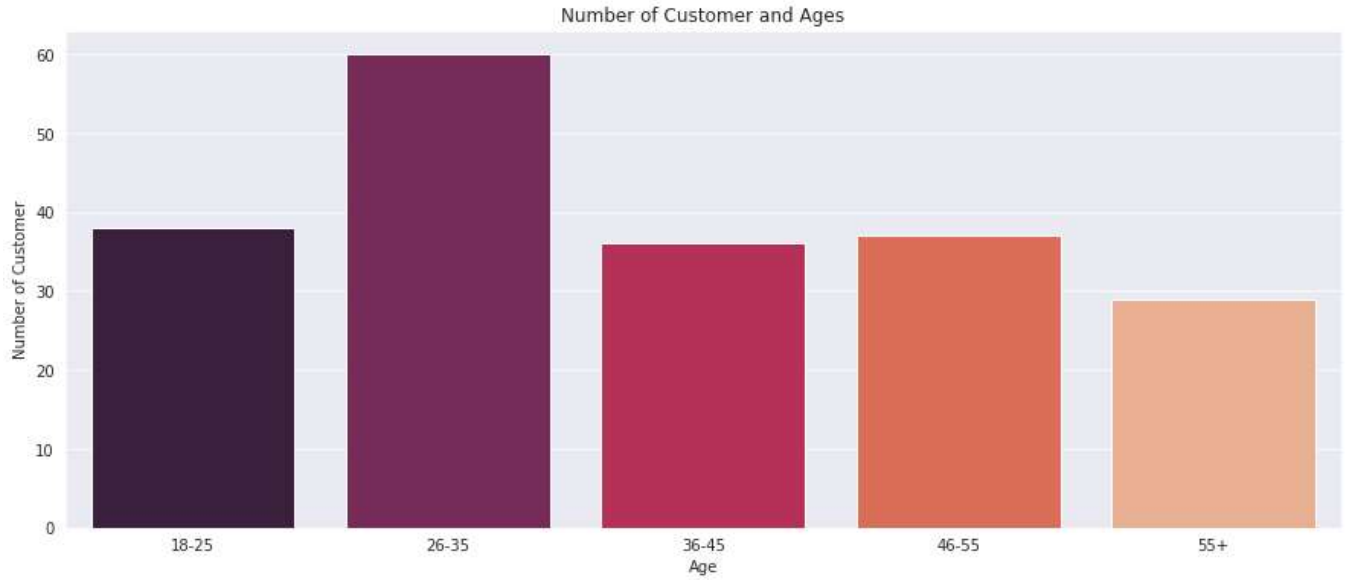

```
genders = data.Gender.value_counts()
sns.set_style("darkgrid")
plt.figure(figsize=(10,4))
sns.barplot(x=genders.index, y=genders.values)
plt.show()
```



```
age18_25 = data.Age[(data.Age <= 25) & (data.Age >= 18)]
age26_35 = data.Age[(data.Age <= 35) & (data.Age >= 26)]
age36_45 = data.Age[(data.Age <= 45) & (data.Age >= 36)]
age46_55 = data.Age[(data.Age <= 55) & (data.Age >= 46)]
age55above = data.Age[data.Age >= 56]

x = ["18-25","26-35","36-45","46-55","55+"]
y = [len(age18_25.values),len(age26_35.values),len(age36_45.values),len(age46_55.values),len(

plt.figure(figsize=(15,6))
sns.barplot(x=x, y=y, palette="rocket")
plt.title("Number of Customer and Ages")
plt.xlabel("Age")
plt.ylabel("Number of Customer")
plt.show()
```

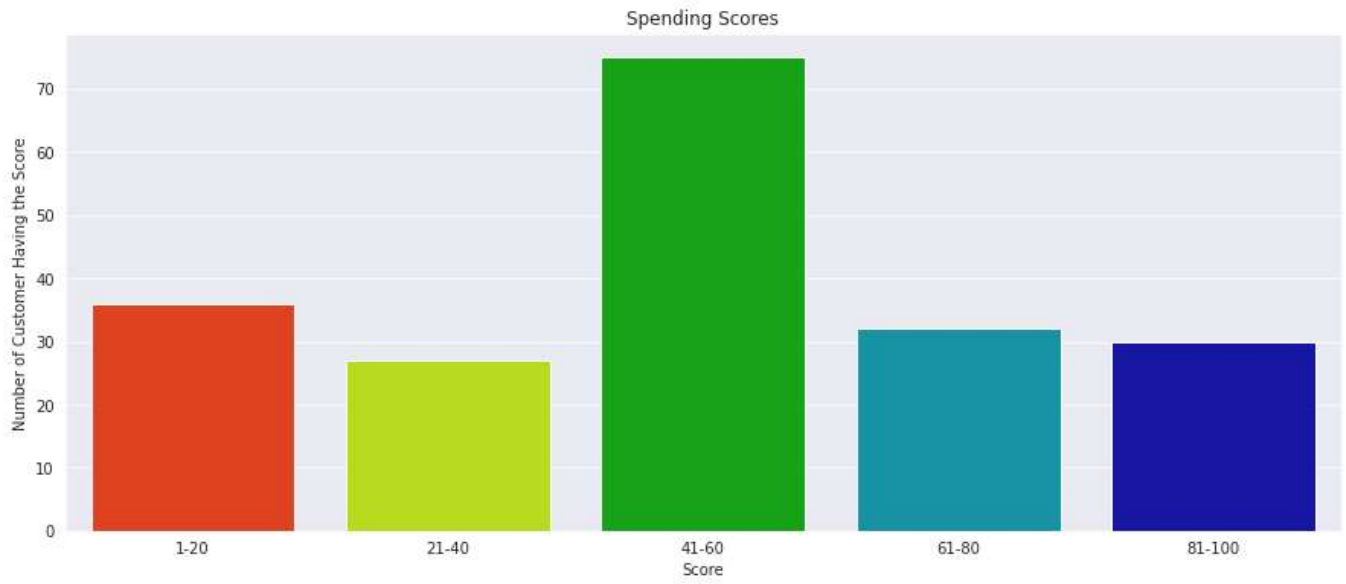



```
ss1_20 = data["Spending Score (1-100)"][(data["Spending Score (1-100)"] >= 1) & (data["Spendi
ss21_40 = data["Spending Score (1-100)"][(data["Spending Score (1-100)"] >= 21) & (data["Spen
ss41_60 = data["Spending Score (1-100)"][(data["Spending Score (1-100)"] >= 41) & (data["Spen
ss61_80 = data["Spending Score (1-100)"][(data["Spending Score (1-100)"] >= 61) & (data["Spen
ss81_100 = data["Spending Score (1-100)"][(data["Spending Score (1-100)"] >= 81) & (data["Spe

ssx = ["1-20", "21-40", "41-60", "61-80", "81-100"]
ssy = [len(ss1_20.values), len(ss21_40.values), len(ss41_60.values), len(ss61_80.values), len

plt.figure(figsize=(15,6))
sns.barplot(x=ssx, y=ssy, palette="nipy_spectral_r")
plt.title("Spending Scores")
plt.xlabel("Score")
```

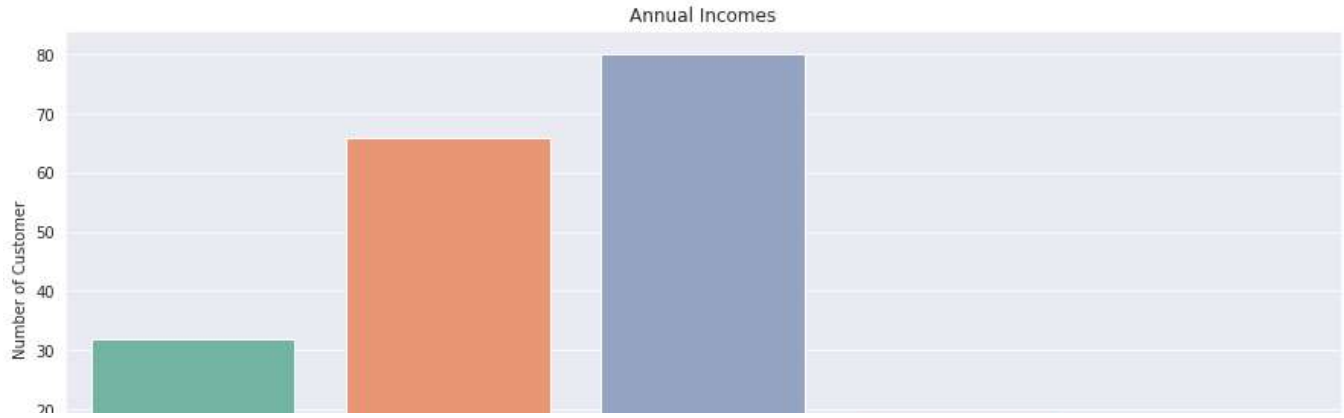
```
plt.xlabel("Score")
plt.ylabel("Number of Customer Having the Score")
plt.show()
```



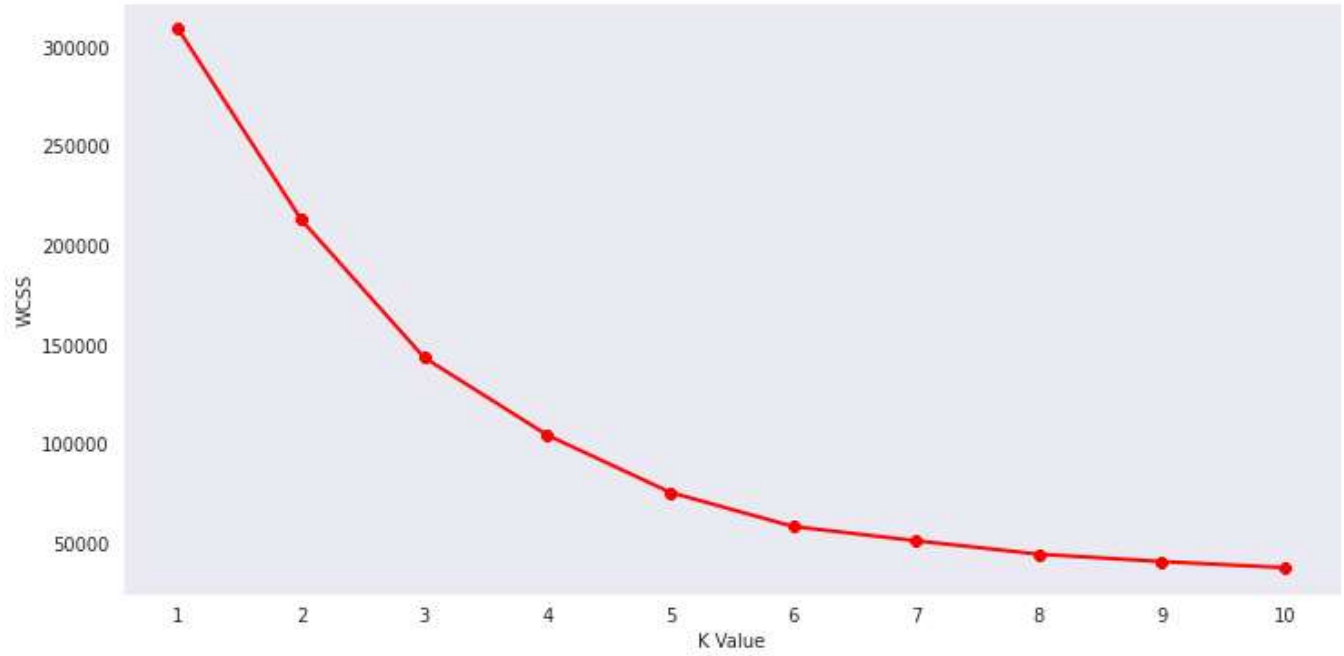

```
ai0_30 = data["Annual Income (k$)"][(data["Annual Income (k$)"] >= 0) & (data["Annual Income
ai31_60 = data["Annual Income (k$)"][(data["Annual Income (k$)"] >= 31) & (data["Annual Incom
ai61_90 = data["Annual Income (k$)"][(data["Annual Income (k$)"] >= 61) & (data["Annual Incom
ai91_120 = data["Annual Income (k$)"][(data["Annual Income (k$)"] >= 91) & (data["Annual Inco
ai121_150 = data["Annual Income (k$)"][(data["Annual Income (k$)"] >= 121) & (data["Annual In

aix = ["$ 0 - 30,000", "$ 30,001 - 60,000", "$ 60,001 - 90,000", "$ 90,001 - 120,000", "$ 120
aiy = [len(ai0_30.values), len(ai31_60.values), len(ai61_90.values), len(ai91_120.values), le

plt.figure(figsize=(15,6))
sns.barplot(x=aix, y=aiy, palette="Set2")
plt.title("Annual Incomes")
plt.xlabel("Income")
plt.ylabel("Number of Customer")
plt.show()
```




```
from sklearn.cluster import KMeans
wcss = []
for k in range(1,11):
    kmeans = KMeans(n_clusters=k, init="k-means++")
    kmeans.fit(data.iloc[:,1:])
    wcss.append(kmeans.inertia_)
plt.figure(figsize=(12,6))
plt.grid()
plt.plot(range(1,11),wcss, linewidth=2, color="red", marker ="8")
plt.xlabel("K Value")
plt.xticks(np.arange(1,11,1))
plt.ylabel("WCSS")
plt.show()
```

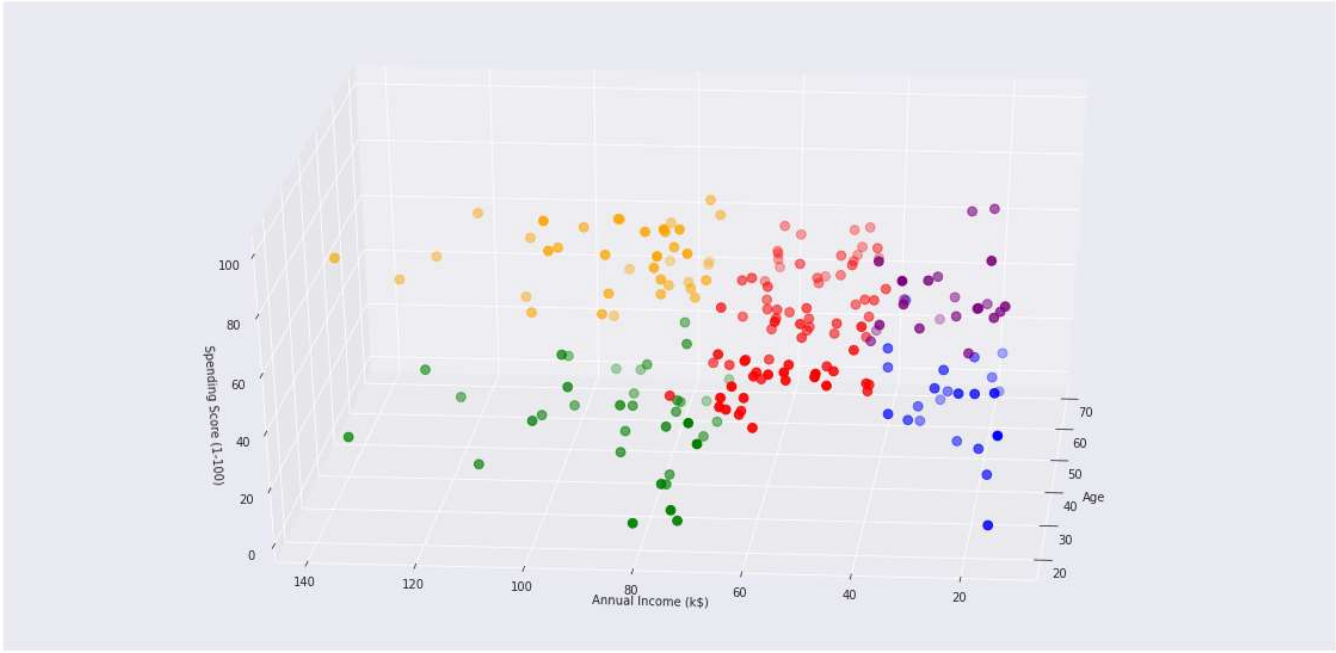



```
km = KMeans(n_clusters=5)
clusters = km.fit_predict(data.iloc[:,1:])
data["label"] = clusters

from mpl_toolkits.mplot3d import Axes3D
```

```
from mpl_toolkits.mplot3d import Axes3D
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd

fig = plt.figure(figsize=(20,10))
ax = fig.add_subplot(111, projection='3d')
ax.scatter(data.Age[data.label == 0], data["Annual Income (k$)"][data.label == 0], data["Spen
ax.scatter(data.Age[data.label == 1], data["Annual Income (k$)"][data.label == 1], data["Spen
ax.scatter(data.Age[data.label == 2], data["Annual Income (k$)"][data.label == 2], data["Spen
ax.scatter(data.Age[data.label == 3], data["Annual Income (k$)"][data.label == 3], data["Spen
ax.scatter(data.Age[data.label == 4], data["Annual Income (k$)"][data.label == 4], data["Spen
ax.view_init(30, 185)
plt.xlabel("Age")
plt.ylabel("Annual Income (k$)")
ax.set_zlabel('Spending Score (1-100)')
plt.show()
```



updated

```
print("hello")
```

```
hello
```