Aim: Basic Python programs.[NumPy, Panda, Matplotlib]

1 Creating blank array with predefined data

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

standings = np.array([575, 285, 234, 206, 206, 205, 200, 175, 97, 62])
```

2 Slicing and Updating elements.

```
# ! Slicing
arr = standings[:4]
print("Data slicing: ", arr)

# ! Updating
standings[0] = 576

# ! Printing updated data
print("Updating data in standings: ", standings)
```

```
Data slicing:  [575 285 234 206]
Updating data in standings:  [576 285 234 206 206 205 200 175  97  62]
```

3 Reshape array

```
# ! Reshaping
newarr = standings.reshape(5, 2)

print(newarr)
```

```
[[576 285]
 [234 206]
 [206 205]
 [200 175]
 [ 97  62]]
```

4 Looping in numpy

```
for i in newarr:
  print(i)
```

```
[576 285]
[234 206]
[206 205]
[200 175]
[97 62]
```

5 Read csv file in numpy

```
from google.colab import drive
drive.mount('/content/drive')

data_set = pd.read_csv("/content/drive/MyDrive/temp/prac_1.csv")
```

```
Mounted at /content/drive
```

6 Create a dataframe

```
df = pd.DataFrame(data_set)
print(df)
```

```
           Drivers  Standing
0     Carlos Sainz       200
1   George Russell       175
```

```
2   Max Verstappen       575
3     Pierre Gasly        62
4     Sergio Perez       285
5    Oscar Piastri        97
6  Fernando Alonso       206
7   Lewis Hamilton       234
8     Lando Norris       205
9  Charles Leclerc       206
```

7 Slicing in created dataframe

```
print(df.iloc[:4])
```

```
          Drivers  Standing
0    Carlos Sainz       200
1  George Russell       175
2  Max Verstappen       575
3    Pierre Gasly        62
```

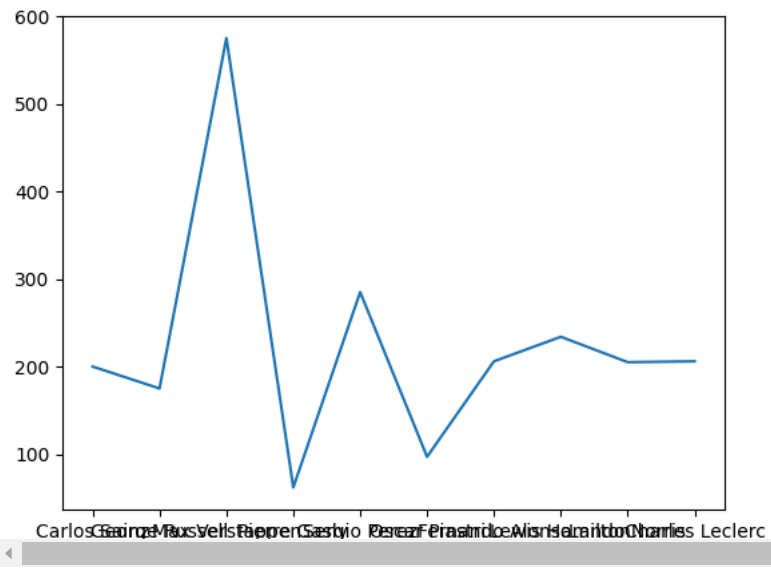
8 Column and Row manipulation

```
np.transpose(data_set)
```

	0	1	2	3	4	5	6	7	8	9
Drivers	Carlos Sainz	George Russell	Max Verstappen	Pierre Gasly	Sergio Perez	Oscar Piastri	Fernando Alonso	Lewis Hamilton	Lando Norris	Charles Leclerc

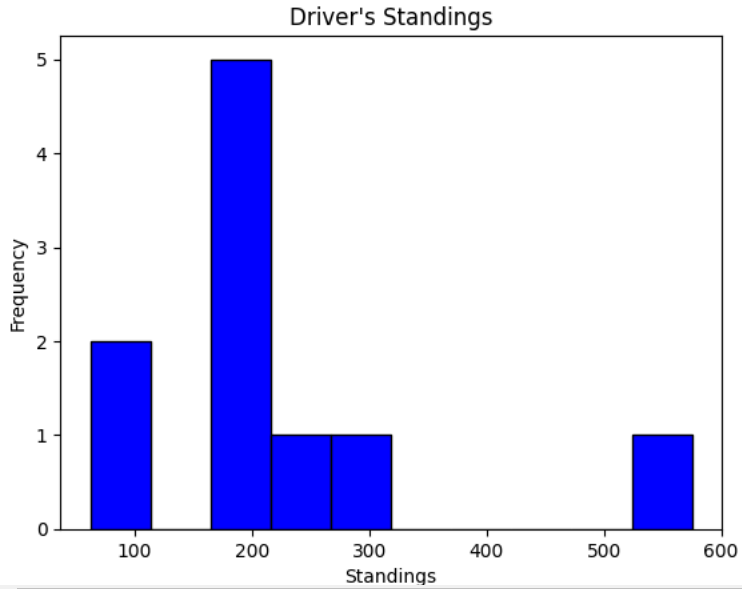
9 Importing matplotlib and make simple line chart

```
plt.plot(df["Drivers"], df["Standing"])
plt.show()
```



10 Make histogram

```
# ! Creating a histogram for standings
plt.hist(df["Standing"], bins=10, color='blue', edgecolor='black')
plt.title("Driver's Standings")
plt.xlabel("Standings")
plt.ylabel("Frequency")
plt.show()
```

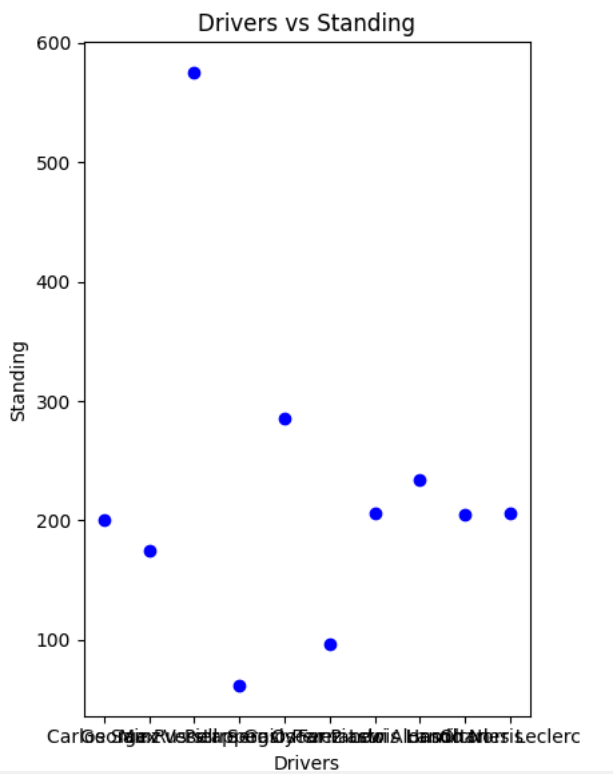


11 Plotting multivariate data

```
plt.figure(figsize=(12, 6))

# ! Plot 1: Drivers vs Standing
plt.subplot(1, 3, 1)
plt.scatter(df["Drivers"], df["Standing"], color='blue')
plt.title("Drivers vs Standing")
plt.xlabel("Drivers")
plt.ylabel("Standing")


plt.tight_layout()
plt.show()
```



12 Plotting pie chart

```
plt.figure(figsize=(8, 8))
plt.pie(df["Standing"], labels=df["Drivers"], autopct='%1.1f%%', startangle=90, colors=plt.cm.tab20.colors)
plt.title("Standings Distribution by Drivers")
plt.show()
```