Python-For-DataScience

10.Write python program

a.To read from a CSV file of the given data using ‘pandas’ library.

b.For the given data, plot the scatter matrix for males only. Explain about 2 sub-populations’ correspondence to gender.

c.For the given data, using python environment, apply 1-sample t-test: testing the value of population mean.

d.For the given data, using python environment, apply 2-sample t-test: testing for difference across the population.

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [7]:
```
data = pd.read_csv('ML/DataFrames/brain_size.csv', sep=';', na_values=".")
print(data.shape)
```

```
(40, 8)
```

In [9]:
```
data.head()
```

Out[9]:

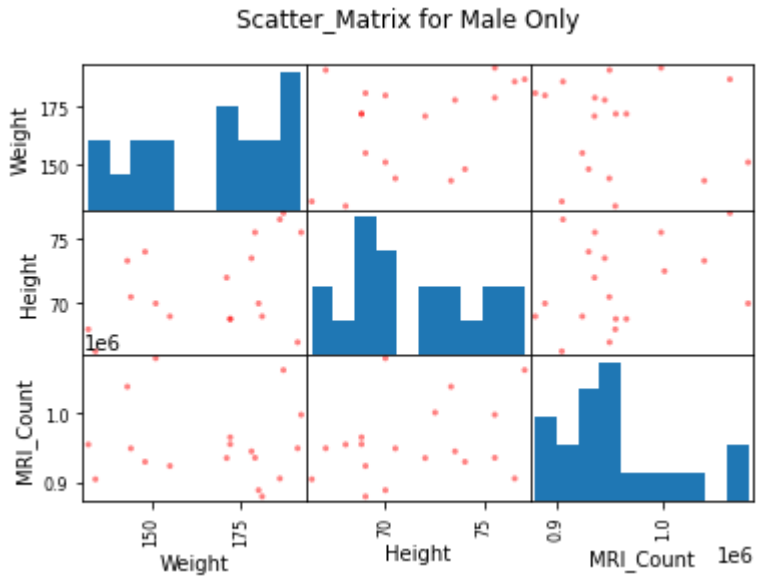
	Unnamed: 0	Gender	FSIQ	VIQ	PIQ	Weight	Height	MRI_Count
0	1	Female	133	132	124	118.0	64.5	816932
1	2	Male	140	150	124	NaN	72.5	1001121
2	3	Male	139	123	150	143.0	73.3	1038437
3	4	Male	133	129	128	172.0	68.8	965353
4	5	Female	137	132	134	147.0	65.0	951545

In [8]:
```
groupby_gender = data.groupby('Gender')
for gender, value in groupby_gender['Height']:
    print((gender, value.mean()))

print(groupby_gender.mean())
```

```
('Female', 65.765)
('Male', 71.43157894736842)
        Unnamed: 0   FSIQ     VIQ     PIQ      Weight     Height  MRI_Count
Gender
Female       19.65  111.9  109.45  110.45  137.200000  65.765000   862654.6
Male         21.35  115.0  115.25  111.60  166.444444  71.431579   954855.4
```

In [12]:
```
male_index=(data["Gender"]=='Male') # to retrive Male indices
male_data=data[male_index] # to separate male data
# scatter matrix for only Weight,height and MRI COunt
pd.plotting.scatter_matrix(male_data[['Weight', 'Height', 'MRI_Count']], color
= 'r')
plt.suptitle("Scatter_Matrix for Male Only")
plt.show()
```



In [13]:
```
from scipy import stats
test_result=stats.ttest_1samp(data['VIQ'], 0)
print("1-Sample t-Test")
print(test_result)
```

```
1-Sample t-Test
Ttest_1sampResult(statistic=30.088099970849328, pvalue=1.3289196468728067e-2
8)
```

In [14]:
```
female_viq=data[data['Gender']=='Female']['VIQ']
male_viq=data[data['Gender']=='Male']['VIQ']
test_result2=stats.ttest_ind(female_viq, male_viq)
print("2 Sample t-test")
print(test_result2)
```

```
2 Sample t-test
Ttest_indResult(statistic=-0.7726161723275011, pvalue=0.44452876778583217)
```