

In [1]:

```
import pandas as pd
import seaborn as sns
```

Q_1

H0: There is no significant difference in diameter of Two Units

Ha: There is a significant difference in diameter of Two Units

level of confidence=5%

In [2]:

```
df=pd.read_csv("Cutlets.csv")
```

In [3]:

```
df.head
```

Out[3]:

```
<bound method NDFrame.head of      Unit A  Unit B
0    6.8090  6.7703
1    6.4376  7.5093
2    6.9157  6.7300
3    7.3012  6.7878
4    7.4488  7.1522
5    7.3871  6.8110
6    6.8755  7.2212
7    7.0621  6.6606
8    6.6840  7.2402
9    6.8236  7.0503
10   7.3930  6.8810
11   7.5169  7.4059
12   6.9246  6.7652
13   6.9256  6.0380
14   6.5797  7.1581
15   6.8394  7.0240
16   6.5970  6.6672
17   7.2705  7.4314
18   7.2828  7.3070
19   7.3495  6.7478
20   6.9438  6.8889
21   7.1560  7.4220
22   6.5341  6.5217
23   7.2854  7.1688
24   6.9952  6.7594
25   6.8568  6.9399
26   7.2163  7.0133
27   6.6801  6.9182
28   6.9431  6.3346
29   7.0852  7.5459
30   6.7794  7.0992
31   7.2783  7.1180
32   7.1561  6.6965
33   7.3943  6.5780
34   6.9405  7.3875>
```

In [4]:

```
from scipy import stats
```

In [5]:

```
t_val,p_val=stats.ttest_ind(df['Unit A'],df['Unit B'])
```

In [6]:

```
print("T_VALUE : ",t_val)
print("P_VALUE : ",p_val)
```

```
T_VALUE :  0.7228688704678063
P_VALUE :  0.4722394724599501
```

In [7]:

```
if p_val<0.05:  
    print("we reject the NULL HYPOTHESIS and we claim that there is a significant difference  
else:  
    print("we failed to reject the NULL HYPOTHESIS and we claim that there is no significant difference in diameter of Two Units
```

we failed to reject the NULL HYPOTHESIS and we claim that there is no significant difference in diameter of Two Units

Q_2

H0: The average of four Turn Around Time report of laboratory are equal

(There is no statistical significant in four Turn Around Time report of laboratory)

Ha: The average of four Turn Around Time report of laboratory are not equal

(There is no statistical significant in four Turn Around Time report of laboratory)

In [8]:

```
df=pd.read_csv("LabTAT.csv")
```

In [9]:

```
df
```

Out[9]:

	Laboratory 1	Laboratory 2	Laboratory 3	Laboratory 4
0	185.35	165.53	176.70	166.13
1	170.49	185.91	198.45	160.79
2	192.77	194.92	201.23	185.18
3	177.33	183.00	199.61	176.42
4	193.41	169.57	204.63	152.60
...
115	178.49	170.66	193.80	172.68
116	176.08	183.98	215.25	177.64
117	202.48	174.54	203.99	170.27
118	182.40	197.18	194.52	150.87
119	182.09	215.17	221.49	162.21

120 rows × 4 columns

In [10]:

```
t_val,p_val=stats.f_oneway(df['Laboratory 1'],df['Laboratory 2'],df['Laboratory 3'],df['Lab
```

In [11]:

```
print("T_VALUE : ",t_val)
print("P_VALUE : ",p_val)
```

```
T_VALUE : 118.70421654401437
P_VALUE : 2.1156708949992414e-57
```

In [12]:

```
if p_val<0.05:
    print("we reject NULL HYPOTHESIS and we claim that there is statsitital significant in
else:
    print("we failed to reject NULL HYPOTHESIS and we claim that there is no statsitital si
```

we reject NULL HYPOTHESIS and we claim that there is statsitital significant
in average TAT of four Laboratorys

Q_3

H0 : There is statsitital significant in male_female buyer rations across regions

Ha:There is no statsitital significant in male_female buyer rations across regions

In [13]:

```
df=pd.read_csv("BuyerRatio.csv")
```

In [14]:

```
df=df.iloc[0:,1:]
```

In [15]:

```
t_val,p_val,de,a=stats.chi2_contingency(df)
```

In [16]:

```
if p_val<0.05:
    print("we reject NULL HYPOTHESIS and we claim that there is statsitital significant in
else:
    print("we failed to reject NULL HYPOTHESIS and we claim that there is no statsitital si
```

we failed to reject NULL HYPOTHESIS and we claim that there is no statsitica
l significant in male_female buyer rations across regions

Q_4

H0: There is statsitital significant in 4 centres data

Ha: There is no statsitital significant in 4 centres data

In [17]:

```
df=pd.read_csv('Costomer+OrderForm.csv')
```

In [18]:

```
df
```

Out[18]:

	Phillippines	Indonesia	Malta	India
0	Error Free	Error Free	Defective	Error Free
1	Error Free	Error Free	Error Free	Defective
2	Error Free	Defective	Defective	Error Free
3	Error Free	Error Free	Error Free	Error Free
4	Error Free	Error Free	Defective	Error Free
...
295	Error Free	Error Free	Error Free	Error Free
296	Error Free	Error Free	Error Free	Error Free
297	Error Free	Error Free	Defective	Error Free
298	Error Free	Error Free	Error Free	Error Free
299	Error Free	Defective	Defective	Error Free

300 rows × 4 columns

In [19]:

```
df['Phillippines'].value_counts()
```

Out[19]:

```
Error Free    271
Defective      29
Name: Phillippines, dtype: int64
```

In [20]:

```
df['Indonesia'].value_counts()
```

Out[20]:

```
Error Free    267
Defective      33
Name: Indonesia, dtype: int64
```

In [21]:

```
df['Malta'].value_counts()
```

Out[21]:

```
Error Free    269
Defective      31
Name: Malta, dtype: int64
```

In [22]:

```
df['India'].value_counts()
```

Out[22]:

```
Error Free    280  
Defective     20  
Name: India, dtype: int64
```

In [23]:

```
import numpy  
a=numpy.array([[271,267,269,280],[29,33,31,20]])
```

In [24]:

```
t_val,p_val,de,a=stats.chi2_contingency(a)
```

In [25]:

```
if p_val<0.05:  
    print("we reject NULL HYPOTHESIS and we claim that there is statsitcal significant in  
else:  
    print("we failed to reject NULL HYPOTHESIS and we claim that there is no statsitcal si
```

```
we failed to reject NULL HYPOTHESIS and we claim that there is no statsitica  
l significant in 4 centre data
```

In []: