In [4]:
```python
import pandas as pd
import numpy as np
from scipy import stats
```

In [3]:
```python
bolt = pd.read_excel("Bolt diameter.xlsx")
bolt
```

Out[3]:

	Diameter
0	11.27
1	12.06
2	12.15
3	9.89
4	10.82
5	13.53
6	10.83
7	8.87
8	11.14
9	9.71
10	11.88
11	9.53
12	13.17
13	10.54
14	11.25
15	10.84
16	11.29
17	10.54
18	10.74
19	10.93

one sample t test

N0:population mean ->specified value

Normality

data is continous

unknown population variance

In [8]:
```python
stats.ttest_1samp(bolt,8.87)
```

Out[8]: Ttest_1sampResult(statistic=array([8.54709067]), pvalue=array([6.18905683e-08]))

N0:is rejected

population mean >8.87

In [10]:
```python
1-stats.t.cdf(8.54709067,19)#19 is deegre of freedom
```

Out[10]: 3.094528422398213e-08

In [ ]: