

1.For Icecream data

```
In [1]: data=[0.593,0.142,0.329,0.691,0.231,0.793,0.519,0.342,0.418]
```

```
In [2]: import stat
import scipy
from scipy import stats
import numpy as np
import pandas as pd
```

```
In [3]: scipy.stats.ttest_1samp(data,0.3,alternative="greater")
```

```
Out[3]: Ttest_1sampResult(statistic=2.101772491460886, pvalue=0.03437385409632537)
```

2.Super Market Example

```
In [4]: (130-120)/(40/np.sqrt(80))
```

```
Out[4]: 2.23606797749979
```

```
In [5]: 1-stats.t.cdf(2.23,df=79)
```

```
Out[5]: 0.014292908802574056
```

```
In [6]: # 1.4% chances ho is true
```

3.Call Center Program

```
In [7]: (4-4.6)/(3/np.sqrt(50))
```

```
Out[7]: -1.4142135623730943
```

```
In [8]: 2*stats.t.cdf(-1.41,df=49)
```

```
Out[8]: 0.1648559451804547
```

4.Tobacco Example

```
In [9]: #subject of treatment and tobacco group.we want performace two sample ttest
#comparing both group
```

```
In [10]: #Ho=data1=data2
#ha=data1!=data2
```

```
In [11]: data1=pd.Series([91,87,99,77,88,91])
data2=pd.Series([101,110,103,93,99,104])
```

```
In [12]: p=scipy.stats.ttest_ind(a=data1,b=data2)
p
```

```
Out[12]: Ttest_indResult(statistic=-3.445612673536487, pvalue=0.006272124350809803)
```

5.Proportion test

```
In [13]: #when we want find out which states employment rate is high?
```

```
In [14]: n1=100000  
p1=0.50  
  
n2=100000  
p2=0.39
```

```
In [15]: sample1=np.random.binomial(1,p1,n1)  
sample2=np.random.binomial(1,p2,n2)
```

```
In [16]: import statsmodels.api as sm  
sm.stats.ttest_ind(sample1,sample2)
```

```
Out[16]: (48.33379954369705, 0.0, 199998.0)
```

```
In [17]: #we got three value test stastic , p value, degree of fredom  
#There are zero percentage chances that both are same
```