

## Import neccessery libraries

```
In [1]: import pandas as pd
import numpy as np
from scipy import stats
```

## Problem

**Sales of products in four different regions is tabulated for males and females. Find if male-female buyer rations are similar across regions**

## Data description

**$\alpha = 0.05$  (95% Confidence)**

**Y = Discrete X = Discrete**

**Since there are more than 2 variable we will perform Chi-Square test**

**H0 = The male-female buyer rations are similar across regions**

**H1 = The male-female buyer rations are not similar across regions**

## Import data

```
In [2]: import os
```

```
In [3]: os.getcwd()
```

```
Out[3]: 'C:\\Users\\Akarsh\\assignment 3'
```

```
In [4]: os.chdir('C:\\Users\\Akarsh\\Desktop\\assignments')
```

```
In [5]: os.getcwd()
```

```
Out[5]: 'C:\\Users\\Akarsh\\Desktop\\assignments'
```

```
In [6]: pd.read_csv('BuyerRatio.csv')
```

```
Out[6]:
```

	Observed Values	East	West	North	South
0	Males	50	142	131	70
1	Females	435	1523	1356	750

## Chi-Square Test

```
In [7]: df = pd.read_csv('BuyerRatio.csv')
```

```
In [8]: stats.chi2_contingency([df["East"], df["West"], df["North"], df["South"]])
```

```
Out[8]: (1.5959455386610577,  
0.6603094907091882,  
3,  
array([[ 42.76531299,  442.23468701],  
       [ 146.81287862, 1518.18712138],  
       [ 131.11756787, 1355.88243213],  
       [  72.30424052,  747.69575948]]))
```

```
In [9]: #P value of Chi-Square test == 0.66 >  $\alpha$ 
```

Thus  $H_0$  is accepted. The male-female buyer ratios are similar across regions

```
In [ ]:
```