In [1]:

```python
#Importing liabraries
import pandas as pd
import numpy as np
from scipy import stats
from scipy.stats import norm
from scipy.stats import chi2_contingency
```

Importing dataset

In [2]:

```python
buyer_data=pd.read_csv('BuyerRatio (1).csv')
buyer_data.head()
```

Out[2]:

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

Initial analysis

In [3]:

```python
buyer_data.dtypes
```

Out[3]:

```
Observed Values    object
East                int64
West                int64
North               int64
South               int64
dtype: object
```

Null Hypothesis(H0):Sales of product for four different region of male-female buyer ratio are similar across regions.

Alternate Hypothesis(Ha):Sales of product for four different region of male-female buyer ratio are not similar across regions.

If p_value <0.05: We reject Null Hypothesis.

If p_value >0.05: We accept Null Hypothesis.

In [4]:

```python
# Make dimensional array
sales=np.array([[50,142,131,70],[435,1523,1356,750]])
sales
```

Out[4]:

```
array([[  50,  142,  131,   70],
       [ 435, 1523, 1356,  750]])
```

In [5]:

```python
# Chi2 contengency independence test
chi2_contingency(sales)
```

Out[5]:

```
(1.595945538661058,
 0.6603094907091882,
 3,
 array([[  42.76531299,  146.81287862,  131.11756787,   72.30424052],
        [ 442.23468701, 1518.18712138, 1355.88243213,  747.69575948]]))
```

In [6]:

```python
#o/p chi2 stats value,p_value,df,expected observation.
```

In [7]:

```python
# Compare p_value with α = 0.05
```

p_value(0.6603)>0.05: Hence, We accept Null Hypothesis(Ha)

The categorical of male and female buyer ratio are similar across regions.

**>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>The End!!
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