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

In [1]:

```
import pandas as pd
import numpy as np
from scipy import stats
from scipy.stats import chi2_contingency
```

In [3]:

```
data = pd.read_csv('BuyerRatio.csv')
data
```

Out[3]:

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

Chi square test

Ho : no differenece in buyer ratios of male & female

H1 : significant difference in buyer ratios of male & female

In [4]:

```
ratio = np.array([[50,142,131,70],[435,1523,1356,750]])
ratio
```

Out[4]:

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

In [6]:

```
chi2_contingency(ratio)
# returns chi square stats, p, Dof, observed val
```

Out[6]:

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

Since the (pvalue=0.66) > (alpha=0.5), therefore accept the null hypothesis.

There is no difference in buyer ratios of male & female across the regions.

In [ ]: