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In [1]: import scipy.stats as stats
import statsmodels.api as sm
import numpy as np
import pandas as pd
import warnings
from PIL import ImageGrab
import matplotlib.pyplot as plt
import seaborn as sns
```

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In [4]: # no association or dependency between the gender based buyer rations across regions on null hypothesis
# There is a significant association or dependency between the gender based buyer rations across regions on alternative hypothesis
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In [ ]: # cut off value Significance 5%
# alpha = 0.05
# As it is a one-tailed test
# alpha = 1-0.95 = 0.05
```

```
In [3]: buyer = pd.read_csv('BuyerRatio.csv')
buyer.head()
```

```
Out[3]:
```

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

```
In [9]: ed = np.array([50, 142, 131, 70, 435, 1523, 1356, 750])
ed = np.array([42.76531299, 146.81287862, 131.11756787, 72.30424052, 442.23468701, 1518.18712138, 1355.88243213, 747.69575948])
```

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In [10]: statistics, p_value = stats.chisquare(observed, expected, ddof = 3)
print("Statistics = ",statistics,"\n",'P_Value = ', p_value)
```

```
Statistics = 1.5959455390914483
P_Value = 0.8095206646905712
```

```
In [11]: # Compare p_value with 'α '(Significance Level)
# If p_value is ≠ 'α ' we failed to reject Null Hypothesis because of Lack of evidence
# If p_value is = 'α ' we reject Null Hypothesis
# interpreting p-value
```

```
In [12]: alpha = 0.05
print('Significance=%.3f, p=%.3f' % (alpha, p_value))
if p_value <= alpha:
    print('We reject Null Hypothesis there is a significance difference between TAT of reports of the laboratories')
else:
    print('We fail to reject Null hypothesis')
```

```
Significance=0.050, p=0.810
We fail to reject Null hypothesis
```

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In [ ]:
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