In [1]:
```
import pandas as pd
from scipy import stats as stats
from scipy.stats import chi2_contingency
from scipy.stats import chi2
```

In [3]:
```
custom=pd.read_csv("C:\\Users\\Admin\\Downloads\\assignment 3\\Q4.csv")
custom.head()
```

Out[3]:

| | Phillippines | Indonesia | Malta | India |
|---|---|---|---|---|
| **0** | Error Free | Error Free | Defective | Error Free |
| **1** | Error Free | Error Free | Error Free | Defective |
| **2** | Error Free | Defective | Defective | Error Free |
| **3** | Error Free | Error Free | Error Free | Error Free |
| **4** | Error Free | Error Free | Defective | Error Free |

In [4]:
```
print(custom['Phillippines'].value_counts(),custom['Indonesia'].value_counts())
```

```
Error Free    271
Defective      29
Name: Phillippines, dtype: int64 Error Free    267
Defective      33
Name: Indonesia, dtype: int64
```

In [5]:
```
observed=([[271,267,269,280],[29,33,31,20]])
```

In [6]:
```
observed
```

Out[6]:
```
[[271, 267, 269, 280], [29, 33, 31, 20]]
```

In [7]:
```
stat,p,dof,expected=chi2_contingency([[271,267,269,280],[29,33,31,20]])
stat
```

Out[7]:
```
3.858960685820355
```

In [8]:
```
p
```

Out[8]:
```
0.2771020991233135
```

In [9]:
```
print('dof=%d'%dof)
print(expected)
```

```
dof=3
[[271.75 271.75 271.75 271.75]
 [ 28.25  28.25  28.25  28.25]]
```

In [13]:
```
alpha=0.05
prob=1-alpha
critical=chi2.ppf(prob,dof)
print('probability=%.3f,critical=%3f ,stat=%.3f'%(prob,critical,stat))
if abs(stat)>= critical:
    print('Dependent(reject H0),variables are rejected')
else:
    print('Independent(fail to reject H0)')
```

```
probability=0.950,critical=7.814728 ,stat=3.859
Independent(fail to reject H0)
```

In [14]:
```
print('signficance=%.3f,p=%.3f'%(alpha,p))
if p<= alpha:
    print('Dependent(rehect H0)')
else:
    print('Independent(fail to reject H0)')
```

```
signficance=0.050,p=0.277
Independent(fail to reject H0)
```

In [ ]:
```

```