—----------import libraries—----------
```
import pandas as pd
import numpy as np
from scipy import stats
from scipy.stats import norm,chi2
from scipy.stats import chi2_contingency
```

—---------read dataset—----------
```
data = pd.read_csv('Downloads/Costomer+OrderForm.csv')
data
```

	Phillippines	Indonesia	Malta	Indi
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
...	...	...	...	...
295	Error Free	Error Free	Error Free	Error Free
296	Error Free	Error Free	Error Free	Error Free
297	Error Free	Error Free	Defective	Error Free
298	Error Free	Error Free	Error Free	Error Free
299	Error Free	Defective	Defective	Error Free

—---------print columns—----------
```
print(data['Phillippines'].value_counts(),data['Indonesia'].value_counts(),data['Malta'].value_counts(),data['India'].value_counts())
```

```
Error Free    271
Defective      29
Name: Phillippines, dtype: int64 Error Free    267
Defective      33
Name: Indonesia, dtype: int64 Error Free    269
Defective      31
Name: Malta, dtype: int64 Error Free    280
Defective      20
Name: India, dtype: int64
```

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

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

```
stats,p,dof,expected = chi2_contingency ([[271,267,269,280],[29,33,31,20]])
```

```
stats
```

```
3.858960685820355
```

```
p
```

```
0.2771020991233135
```

```
print('dof=%d' %dof)
print(expected)
```

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

```
alpha = 0.05
prob = 1-alpha
critical = chi2.ppf(prob,dof)
print('probability=%.3f','critical=%.3f','stats=%.3f' % (prob,critical,stats))
if abs(stats) >= critical:
    print('Dependent(reject H0),variables are related')
else:
    print('Independent(reject H0),variables are not related')

print ('significance=%.3f,p=%.3f' %(alpha,p))
if p <= alpha:
    print('Dependent (reject H0)')
else:
    print('Independent (fail to reject H0)')
```

```
significance=0.050,p=0.950
Independent (fail to reject H0)
```