Chi-Square test

**Data Provided:**

The data is summarized in a contingency table showing the counts of customers in each satisfaction level for both types of devices:

| **Satisfaction** | **Smart Thermostat** | **Smart Light** | **Total** |
| --- | --- | --- | --- |
| Very Satisfied | 50 | 70 | 120 |
| Satisfied | 80 | 100 | 180 |
| Neutral | 60 | 90 | 150 |
| Unsatisfied | 30 | 50 | 80 |
| Very Unsatisfied | 20 | 50 | 70 |
| **Total** | 240 | 360 | 600 |

**Objective:**

To use the Chi-Square test for independence to determine if there's a significant association between the type of smart home device purchased (Smart Thermostats vs. Smart Lights) and the customer satisfaction level

Answer:

**Null hypothesis:**

We start by defining the null hypothesis (H0) which states that there is no relation between the variables.

An alternate hypothesis would state that there is a significant relation between the two.

**Chi Square tet python code**

from scipy.stats import chi2\_contingency

data= [[50, 80, 60, 30, 20],[70,100,90, 50,50]]

stats, p, dof, expected = chifrom scipy.stats import chi2\_contingency 2\_contingency(data)

stats, p, dof, expected

(5.638227513227513,

0.22784371130697179,

4,

array([[ 48., 72., 60., 32., 28.],

[ 72., 108., 90., 48., 42.]]))

**P value is 0.22784371130697179** which is greater than alpha value 0.05 which means Ho (Null hypothesis holds) both are independent variable.

**Chi square value is 5.638227513227513**

**Degree of freedom = (no.rows -1)\* (no. col-1)=(5-1)(2-1)=4**

**Creatical value is 9.488.**