Hypothesis Testing

Bombay Hospitality Ltd. operates a franchise model for producing exotic Norwegian dinners throughout New England. The operating cost for a franchise in a week (W) is given by the equation W = $1,000 + $5X, where X represents the number of units produced in a week. Recent feedback from restaurant owners suggests that this cost model may no longer be accurate, as their observed weekly operating costs are higher.

**Objective:**

To investigate the restaurant owners' claim about the increase in weekly operating costs using hypothesis testing.

**Data Provided:**

* The theoretical weekly operating cost model: W = $1,000 + $5X
* Sample of 25 restaurants with a mean weekly cost of Rs. 3,050
* Number of units produced in a week (X) follows a normal distribution with a mean (μ) of 600 units and a standard deviation (σ) of 25 units

Answer:

Null Hypothesis: There is no increase in weekly operating cost

Alternate: Increase in operating cost

Mean = 1000+5\*600= 4000

Standard deviation = 1000+5\*25=1125

Sample Size = 25

Sample mean = 3050

T statistic=( mean-sample mean)/ (1125/sqrt(Sample size)

from scipy import stats

**import scipy**

**import numpy as np**

**z= (4000-3050)/(1125/np.sqrt(25))**



z

Out[12]:

4.222222222222222

**2\*stats.t.cdf(-z,24)**

0.00030009323047423705

The Critical value is 4.222222222222222

P value is 0.0003 which is less than alpha value 0.05 hence rejecting

null hypothesis.