

### Hypothesis Testing 1:

P = Proportion of people watching horror movies alone     $\alpha = 0.05$  i.e. 5% risk of type I

Null Hypothesis:

$$P \geq \frac{1}{2}(p_0)$$

Alternative Hypothesis:

$$P < \frac{1}{2}(p_0)$$

$$n \cdot p_0 = 355 \cdot \frac{1}{2} = 177.5 \geq 5 \text{ and } n \cdot (1 - p_0) \geq 5$$

Hence we can approximate the P of the population as  $\sim N[p_0, (p_0(1-p_0)/n)]$

$$\text{Mean} = p_0, \text{variance} = (p_0(1-p_0)/n)$$

$$(P - p_0) / (\sqrt{\text{variance}}) = Z^*$$

$$Z^* = -3.556$$

P-value approach:

$$\Pr(Z \leq Z^*) = \Pr(Z \leq -3.556) = 0.000188$$

$$p\text{-value} \leq \alpha$$

hence we reject null hypothesis .

Rejection region approach:

$$P(X < Z) = 0.05,$$

$$Z_{\{0.05\}} = -1.645 \text{ on the left of standard normal}$$

$$Z^* \leq -1.645$$

Hence we reject null hypothesis

### Hypothesis Testing 2:

Data based **How much money do you spend on watching Movies per month(in theaters + OTT subscription):**

Null Hypothesis: Data collected follows normal distribution

Alternative Hypothesis: Data collected doesn't follow normal distribution

From QQ plot for it:

Data doesn't follow normal distribution as the curve obtained is very far from straight line

<https://github.com/gunjitmittal/Stats-Project/blob/main/Normalitycheck/QQplt2.png>

### Hypothesis Testing 3:

Data based **How much hours do you generally spend on Movies in a week.**

Null Hypothesis: Data collected follows normal distribution

Alternative Hypothesis: Data collected doesn't follow normal distribution

From QQ plot for it:

Data Distribution is near to normal distribution as the curve obtained is similar to straight line to most extent.

<https://github.com/gunjitmittal/Stats-Project/blob/main/Normalitycheck/QQplt1.png>