

Oliver Luo

1)

$$\hat{\theta} = \frac{1}{n} \sum_{i=1}^n X_i^2.$$

2)

Expectation of \bar{x}

$$\begin{aligned} E(\bar{X}) &= E\left(\frac{X_1 + X_2 + \cdots + X_n}{n}\right) \\ &= \frac{1}{n} E(X_1 + X_2 + \cdots + X_n) \\ &= \frac{1}{n} (\mu + \mu + \cdots + \mu) \\ &= \frac{1}{n} n\mu \\ &= \mu. \end{aligned}$$

Variance of \bar{X}

$$\begin{aligned} \text{var}(\bar{X}) &= \text{var}\left(\frac{X_1 + X_2 + \cdots + X_n}{n}\right) \\ &= \left(\frac{1}{n}\right)^2 \text{var}(X_1 + X_2 + \cdots + X_n) \\ &= \left(\frac{1}{n}\right)^2 (\sigma^2 + \sigma^2 + \cdots + \sigma^2) \\ &= \left(\frac{1}{n}\right)^2 n\sigma^2 \\ &= \frac{\sigma^2}{n}. \end{aligned}$$

3)

$$\sum (y_i - p_i)^2$$

What is the title of your project?

Disease Prevention

What is the data of your project?

Database with medical information of residents.

What do you intend to do?

How to predict disease outbreaks in communities.