Homework 3

9/16/22

Homework 3 is due 9/23/2022 at 11:59 PM. Submit your homework on Canvas as one PDF document.

The PDF version of this assignment can be found here.

1. Let $X_1, X_2, \dots, X_n \overset{iid}{\sim} N(\mu, \sigma^2)$ and $Z_i = \frac{X_i - \mu}{\sigma}$. Find the distribution of $Y = \sum_{i=1}^{n} Z_i^2$.

2. Let $X_1, X_2, \dots, X_n \overset{iid}{\sim} N(\mu, \sigma^2)$ and $a_1, a_2, \dots, a_n$ be a set of known constants. Find the distribution of $Y = \sum_{i=1}^{n} a_i X_i$.

3. Let $X_1 \sim Bin(n_1, p)$ and $X_2 \sim Bin(n_2, p)$. Find the distribution function of $Y = X_1 + X_2$. Assume $X_1 \perp X_2$.