

STAT 211: Business Statistics

M6: Sampling Distributions

L3: The Uniform Distribution

Learning Outcome

By the end of this lecture, you will be able to:

- Define Uniform distribution
- Calculate the probabilities of a Uniform Random Variable

Introduction

In this lecture, we learn about uniform distribution and the method to calculate the probabilities of a Uniform random variable.

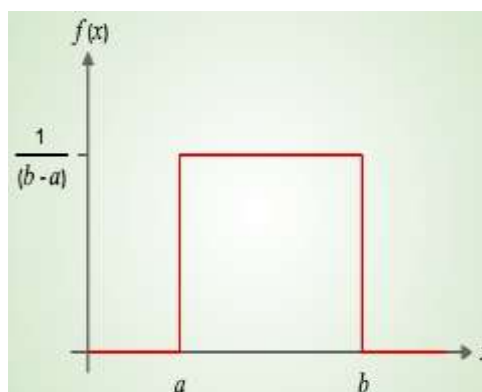
Uniform Distribution

The probability density function for the uniform distribution is given here:

$$f(x) = \begin{cases} \frac{1}{b-a} & \text{if } a \leq x \leq b \\ 0 & \text{if } x \text{ is not between } a \text{ and } b \end{cases} \quad (1)$$

Where:

- $f(x)$ = Value of the density function at any x value
- a = Lower limit of the domain
- b = Upper limit of the domain



Uniform distribution

Mean and Standard Deviation for Uniform Distribution

Here are the formulae for expected value or mean and standard deviation for the uniform distribution.

$$\text{Expected value (mean): } E(x) = \mu = \frac{a + b}{2} \quad (2)$$

$$\text{Standard deviation: } \sigma = \sqrt{\frac{(b - a)^2}{12}} \quad (3)$$

Recap

In this lecture, you have learned that:

- Uniform distribution assigns equal probabilities to all values between its minimum and maximum points