

# Assignment 7

## AI1110: Probability and Random Variables

### Indian Institute of Technology Hyderabad

Ankit Saha  
AI21BTECH11004

1 May 2022

## CBSE Probability Grade 11

**Exercise 16.3.10** A letter is chosen at random from the word 'ASSASSINATION'. Find the probability that the letter is:

- (i) a vowel
- (ii) a consonant

**Solution.** Let a random variable  $X \in \{0, 1\}$  denote whether the chosen letter is a vowel or a consonant respectively.

$x$	Letter	$n(X = x)$	$\Pr(X = x)$
0	Vowel	6	$\frac{6}{13}$
1	Consonant	7	$\frac{7}{13}$

TABLE 1

- (i) The probability that the chosen letter is a vowel is given by:

$$\Pr(X = 0) = \frac{n(X = 0)}{n(X = 0) + n(X = 1)} \quad (1)$$

$$= \frac{6}{6 + 7} \quad (2)$$

$$= \frac{6}{13} \approx 0.462 \quad (3)$$

- (ii) The probability that the chosen letter is a consonant is given by:

$$\Pr(X = 1) = \frac{n(X = 1)}{n(X = 0) + n(X = 1)} \quad (4)$$

$$= \frac{7}{6 + 7} \quad (5)$$

$$= \frac{7}{13} \approx 0.538 \quad (6)$$

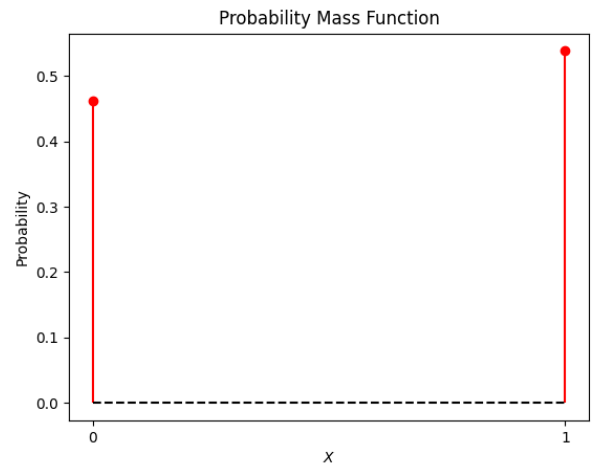


Fig. 1: Plot of the probability mass function