Assignment 1

AI1110: Probability and Random Variables

Indian Institute of Technology Hyderabad

Aditya Garg
CS22BTECH11002

26 April 2023

10.15.1.4: Which of the following cannot be the probability of an event ?
(A) $\frac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7

Solution:

Probability of an event E , written as $\Pr(E)$

$$\Pr(E) = \frac{\text{Number of outcomes favourable to } E}{\text{Total Number of possible outcomes in sample space}} \tag{1}$$

From the definition of probability $\Pr(E)$, number of favourable outcomes is always less than or equal to the number of all possible outcomes.

$$0 \le \Pr(E) \le 1 \tag{2}$$

(A) $\Pr(E) = \frac{2}{3}$

$$\because\ 0 \le \frac{2}{3} \le 1 \tag{3}$$

From (2) ,
It can be probability of an event.

(B) $\Pr(E) = -1.5$

$$\because\ -1.5 < 0 \tag{4}$$

From (2) ,
It cannot be a probability of any event.

(C) $\Pr(E) = 15\%$

$$15\% = \frac{15}{100} \tag{5}$$

$$\because\ 0 \le \frac{15}{100} \le 1 \tag{6}$$

From (2) ,
It can be probability of an event.

(D) $\Pr(E) = 0.7$

$$\because\ 0 \le 0.7 \le 1 \tag{7}$$

From (2) ,
It can be a probability of an event.