

Assignment 1

AI1110: Probability and Random Variables

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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 $\Pr(E)$

From (2) ,
It can be probability of an event.
(D) $\Pr(E) = 0.7$

$$\therefore 0 \leq 0.7 \leq 1 \quad (7)$$

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

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

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

$$0 \leq \Pr(E) \leq 1 \quad (2)$$

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

$$\therefore 0 \leq \frac{2}{3} \leq 1 \quad (3)$$

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

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

$$\therefore -1.5 < 0 \quad (4)$$

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

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

$$15\% = \frac{15}{100} \quad (5)$$

$$\therefore 0 \leq \frac{15}{100} \leq 1 \quad (6)$$