

11.16.3.17.1

EE24BTECH11015 - Dhawal

Question:

For an event A, $p(A) = 0.42$. Find $p(A^c)$.

Theoretical Solution:

$$p(A^c) = 1 - p(A) \quad (1)$$

$$p(A^c) = 0.58 \quad (2)$$

Computational Solution:

The Bernoulli R.V is defined as,

$$X_i = \begin{cases} 0 & A^c \\ 1 & A \end{cases} \quad (3)$$

The PMF represents the probability of each outcome in the sample space S . For this

$$S = [0, 1],$$

the PMF is given as:

$$p_X(n) = \begin{cases} 1 - 0.42 & n = 0 \\ 0.42 & n = 1 \\ 0 & n \notin S. \end{cases} \quad (4)$$

Simulation Process

- 1) We will define a Bernoulli random variable that generates 1 for A and 0 for A^c .
- 2) $p(1) = p(A) = 0.42$ and $p(0) = p(A^c) = 0.58$
- 3) It will generate 1000 values.
- 4) Then will find $p(A)$ and $p(A^c)$
- 5) At last we will show stem plot.

Using random function 1000 times obtain 0 or 1, where $p(1) = 0.42$

$$p(A) = \frac{\text{Number of 1}}{1000} \quad (5)$$

$$p(A^c) = \frac{\text{Number of 0}}{1000} \quad (6)$$

Final Solution

We get,

$$p(A) = 0.4238 \quad (7)$$

$$p(A^c) = 0.5762 \quad (8)$$

