

# Assignment

## EE23010: Probability and Random Processes

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Question: Four candidates A, B, C, D have applied for the assignment to coach a school cricket team. If A is twice as likely to be selected as B, and B and C are given about the same chance of being selected, while C is twice as likely to be selected as D, what are the probabilities that

- 1) C will be selected?
- 2) A will not be selected?

2) For A not getting selected:

$$= 1 - p_X(1) \quad (8)$$

$$= 1 - \frac{4}{9} \quad (9)$$

$$= \frac{5}{9} \quad (10)$$

**Solution:** Let  $X$  be a random variable

$$X = \begin{cases} 0 & \text{A is selected} \\ 1 & \text{B is selected} \\ 2 & \text{C is selected} \\ 3 & \text{D is selected} \end{cases} \quad (1)$$

Given,

$$p_X(0) = 2p_X(1) \quad (2)$$

$$p_X(1) = p_X(2) \quad (3)$$

$$p_X(2) = 2p_X(3) \quad (4)$$

Using axioms of probability:

$$\sum_{k=0}^3 p_X(k) = 1 \quad (5)$$

which gives

$$p_X(k) = \begin{cases} \frac{4}{9} & k = 0 \\ \frac{2}{9} & k = 1 \\ \frac{2}{9} & k = 2 \\ \frac{1}{9} & k = 3 \end{cases} \quad (6)$$

1) For C getting selected:

$$\Rightarrow p_X(2) = \frac{2}{9} \quad (7)$$