Assignment

EE23010: Probability and Random Processes
Indian Institute of Technology,Hyderabad

Aman Kumar
EE22BTECH11006

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?

Solution: Given,

$$\Pr(A) = 2\Pr(B) \tag{1}$$
$$\Pr(B) = \Pr(C) \tag{2}$$
$$\Pr(C) = 2\Pr(D) \tag{3}$$

Let,

$$\Pr(B) = x \tag{4}$$

then,

$$\Pr(A) = 2x \tag{5}$$
$$\Pr(B) = \Pr(C) = x \tag{6}$$
$$\Pr(D) = \frac{x}{2} \tag{7}$$

and

$$\Pr(A) + \Pr(B) + \Pr(C) + \Pr(D) = 1 \tag{8}$$
$$2x + x + x + \frac{x}{2} = 1 \tag{9}$$
$$\implies \Pr(B) = \frac{2}{9} \tag{10}$$

1) For C getting selected:

$$\Pr(C) = \Pr(B) \tag{11}$$
$$\implies \Pr(C) = \frac{2}{9} \tag{12}$$

2) For A not getting selected:

$$\Pr\left(A'\right) = 1 - \Pr(A) \tag{13}$$
$$= 1 - 2\Pr(B) \tag{14}$$
$$= 1 - \frac{4}{9} \tag{15}$$
$$\implies \Pr\left(A'\right) = \frac{5}{9} \tag{16}$$