

Assignment 5

Pradeep Mundlik (AI21BTECH11022)

1 QUESTION-

Let A and B be independent events with $P(A) = 0.3$ and $P(B) = 0.4$. Find (i) $P(A \cap B)$ (ii) $P(A \cup B)$ (iii) $P(A|B)$ (iv) $P(B|A)$

2 ANSWER-

2.1. Part(i):

As A and B are independent events

$$P(A \cap B) = P(A) \times P(B) \quad (2.1.1)$$

$$\implies P(A \cap B) = 0.3 \times 0.4 \quad (2.1.2)$$

$$\implies P(A \cap B) = 0.12 \quad (2.1.3)$$

2.2. Part(ii):

We know that,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) \quad (2.2.1)$$

$$\implies P(A \cup B) = 0.3 + 0.4 - 0.12 \quad (2.2.2)$$

$$\implies P(A \cup B) = 0.58 \quad (2.2.3)$$

2.3. Part(iii):

As A and B are independent events

$$P(A|B) = P(A) \quad (2.3.1)$$

$$\implies P(A|B) = 0.3 \quad (2.3.2)$$

2.4. Part(iv):

As A and B are independent events

$$P(B|A) = P(B) \quad (2.4.1)$$

$$\implies P(B) = 0.4 \quad (2.4.2)$$