AI5002 - Assignment 6

Tuhin Dutta
ai21mtech02002

Download code and LaTeX from below hyperlinks
1. Codes/MiscDist_6_8.py
2. LaTeX

***Problem* 6.8**

A and B are two events such that P (A) $\neq$ 0.
Find P (B / A), if
(i) A $\subset$ B
(ii) A $\cap$ B = ϕ

Solution

Given P (A) $\neq$ 0.
We know,

$$P\ (\ B/A\ )\ = \frac{P\ (A\ \cap\ B)}{P\ (A)} \qquad (0.0.1)$$

(i) If A $\subset$ B

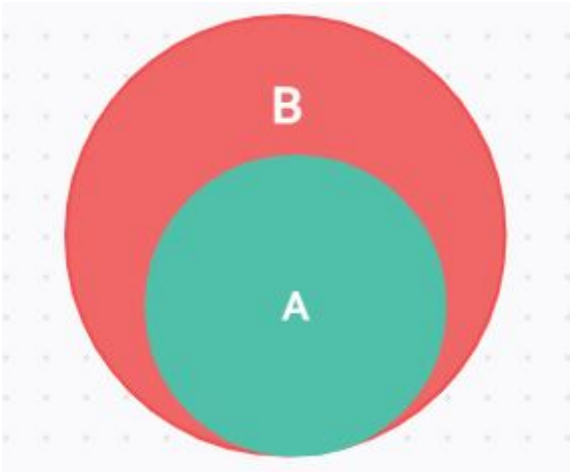

Fig 1.1: A $\subset$ *B*

$\implies$ *A* $\cap$ B = A
$\implies$ *P* (*A* $\cap$ B) = P (A)

Putting P (A $\cap$ B) in (0.0.1), we get

$$P\ (\ B/A\ )\ = \frac{P\ (A)}{P\ (A)} = 1$$

(ii) If A $\cap$ B = ϕ

Fig 1.2: A $\cap$ B = ϕ

$\implies$ *P* (*A* $\cap$ B) = 0

Putting P (A $\cap$ B) in (0.0.1), we get

$$P\ (\ B/A\ )\ = \frac{0}{P\ (A)} = 0$$