Assignment 1
AI1110:Probability And Random Variables
Indian Institute of Technology, Hyderabad

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12.13.6.19:If A and B are any two events such that $\Pr(A)+\Pr(B)-\Pr(AB)=\Pr(A)$,then choose the correct option

(a) $\Pr(B|A)=1$
(b) $\Pr(A|B)=1$
(c) $\Pr(B|A)=0$
(d) $\Pr(A|B)=0$

Solution: Given

$$\Pr(A) + \Pr(B) - \Pr(AB) = \Pr(A) \qquad (1)$$

$$\Pr(B) - \Pr(AB) = 0 \qquad (2)$$

$$\Pr(B) = \Pr(AB) \qquad (3)$$

1) $\Pr(B|A)$

$$\Pr(B|A) = \frac{\Pr(AB)}{\Pr(A)} \qquad (4)$$

$$\Pr(B|A) = \frac{\Pr(B)}{\Pr(A)} \qquad (5)$$

2) $\Pr(A|B)$

$$\Pr(A|B) = \frac{\Pr(AB)}{\Pr(B)} \qquad (6)$$

$$\Pr(A|B) = \frac{\Pr(B)}{\Pr(B)} \qquad (7)$$

$$\Pr(A|B) = 1 \qquad (8)$$

∴ **Option b is Correct**