AI1110: Probability and Random Variables
Assignment 7

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Outline

1. Question

2. Solution
   - Data Given from Question
   - Result

Question

Show that if $AB = \{\phi\}$, then $\Pr(A) \leq \Pr(B')$

Data Given from Question

Given,

$$AB = 0 \tag{1}$$
$$\implies \Pr(AB) = 0 \tag{2}$$

Theory

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \tag{3}$$

Result

By (2) and (3),

$$\Pr(A + B) = \Pr(A) + \Pr(B) \leq 1 \tag{4}$$
$$\implies \Pr(A) + 1 - \Pr(B') \leq 1 \tag{5}$$
$$\implies \Pr(A) \leq \Pr(B') \tag{6}$$

By (6), Proved.