AI1103 - Assignment 1

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Download all python codes from

https://github.com/vishwahurakadli/AI1103/blob/main/code_1.py

and latex-tikz codes from

https://github.com/vishwahurakadli/AI1103

1 Misc Problem 6.25

If $\Pr(A) = 0.8$, $\Pr(B) = 0.5$ and $\Pr(B/A) = 0.4$ Evaluate
(1) $\Pr(AB)$
(2) $\Pr(A/B)$
(3) $\Pr(A + B)$

2 Solution

(1) By the definition

$$\Pr(B/A) = \frac{\Pr(AB)}{\Pr(A)} \tag{2.0.1}$$

Substituting the values,

$$\Pr(AB) = \frac{2}{5} \times \frac{4}{5} \tag{2.0.2}$$

$$\Pr(AB) = \frac{8}{25} \tag{2.0.3}$$

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(2) By the definition

$$\Pr(A/B) = \frac{\Pr(AB)}{\Pr(B)} \tag{3.0.1}$$

Substituting the values,

$$\Pr(A/B) = \frac{\frac{8}{25}}{\frac{1}{2}} \tag{3.0.2}$$

$$\Pr(A/B) = \frac{16}{25} \tag{3.0.3}$$

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(3) By the result

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \tag{4.0.1}$$

Substituting the values,

$$\Pr(A + B) = \frac{4}{5} + \frac{1}{2} - \frac{8}{25} \tag{4.0.2}$$

$$\Pr(A + B) = \frac{98}{100} \tag{4.0.3}$$