

AI5002: Assignment 9

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Download all Python codes from

https://github.com/Debolena/AI5002-Probability-and-Random-Variables/blob/main/Assignment_9/simulation_assignment9.py

and latex-tikz codes from

https://github.com/Debolena/AI5002-Probability-and-Random-Variables/blob/main/Assignment_9/latex.tex

1 PROBLEM

Let A and B be independent events with $P(A) = 0.3$ and $P(B) = 0.4$. Find

- 1) $P(A \cap B)$
- 2) $P(A \cup B)$
- 3) $P(A|B)$
- 4) $P(B|A)$

2 SOLUTION

1) Given, A and B are independent events.

$$P(A \cap B) = P(A) * P(B) \quad (2.0.1)$$

$$= 0.3 * 0.4 \quad (2.0.2)$$

$$= 0.12 \quad (2.0.3)$$

2)

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) \quad (2.0.4)$$

$$= 0.3 + 0.4 - 0.12 \quad (2.0.5)$$

$$= 0.58 \quad (2.0.6)$$

3) Since A and B are independent events,

$$P(A|B) = P(A) = 0.3 \quad (2.0.7)$$

4)

$$P(B|A) = P(B) = 0.4 \quad (2.0.8)$$