

Assignment 2

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Download all python codes from

<https://github.com/Yagna20/AI1103/blob/main/Assignment%202/assignment%202.py>

and latex-tikz codes from

<https://github.com/Yagna20/AI1103/blob/main/Assignment%202/assignment%202.tex>

1 PROBLEM Q.47

A fair dice is tossed two times. The probability that the second toss results in a value that is higher than the first toss is

2 SOLUTION

Let $X \in \{0, 1, 2\}$ represent a random variable where

- $0 \rightarrow$ both the tosses are equal.
- $1 \rightarrow$ first toss value is greater than second toss value.
- $2 \rightarrow$ second toss value is greater than first toss value.

As

$$\Pr(X = 0) = \frac{1}{6} \quad (2.0.1)$$

$$\Pr(X = 1) = \Pr(X = 2) \quad (2.0.2)$$

$$(2.0.3)$$

and $\Pr(X = 0) + \Pr(X = 1) + \Pr(X = 2) = 1$

So the probability that the second toss value is greater than first toss value is

$$\Pr(X = 1) = \Pr(X = 2) = \frac{1 - \Pr(X = 0)}{2}$$

$$\Pr(X = 2) = \frac{1 - \frac{1}{6}}{2} = \frac{\frac{5}{6}}{2} = \frac{5}{12} \quad (2.0.4)$$

So the probability that second toss value is greater than first toss value is $\frac{5}{12}$.