

# AI1103 ASSIGNMENT 2

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Download the python code from

<https://github.com/sarandeepmannam/AI1103-ASSIGNMENT-2/blob/main/Assignment2.py>

and latex-tikz code from

<https://github.com/sarandeepmannam/AI1103-ASSIGNMENT-2/blob/main/Assignment2.tex>

## 1 QUESTION-GATE EC 58

Let the random variable  $X$  have the distribution function:

$$F(x) = \begin{cases} 0 & X < 0 \\ \frac{x}{2} & 0 \leq X < 1 \\ \frac{3}{5} & 1 \leq X < 2 \\ \frac{1}{2} + \frac{x}{8} & 2 \leq X < 3 \\ 1 & X \geq 3 \end{cases}$$

Then  $P(2 \leq X < 4)$  is equal to:

## 2 SOLUTION-GATE EC 58

Given  $F(X)$  is the CDF of the random variable  $X$ .  $P(2 \leq X < 4)$  will be the sum of all the probabilities of values the random variable  $X$  can take in  $[2, 4)$ . So it is the difference between CDF values of the random variable  $X$  at  $X=4^-$  and at  $X=2^-$ . Therefore,

$$P(2 \leq X < 4) = \lim_{X \rightarrow 4^-} F(X) - \lim_{X \rightarrow 2^-} F(X) \quad (2.0.1)$$

$$= \lim_{X \rightarrow 4^-} 1 - \lim_{X \rightarrow 2^-} \frac{3}{5} \quad (2.0.2)$$

$$= 1 - \frac{3}{5} \quad (2.0.3)$$

$$= \frac{2}{5} = 0.4 \quad (2.0.4)$$

Hence,  $P(2 \leq X < 4) = 0.4$ .

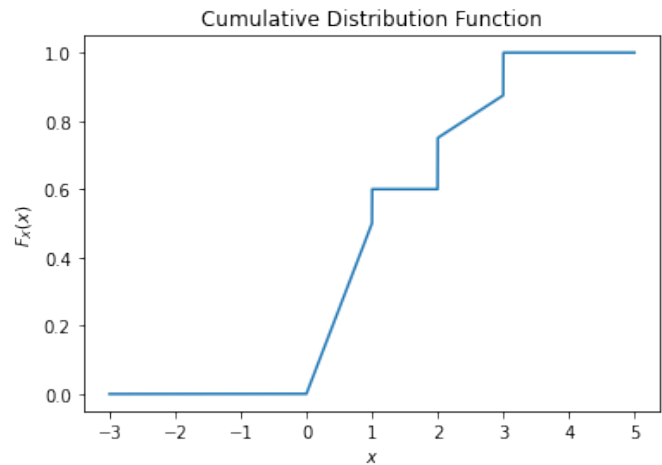


Fig. 0: CDF of X