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:

$$F(x) = \begin{cases} 0 & X < 0 \\ \frac{X}{2} & 0 \le X < 1 \\ \frac{3}{5} & 1 \le X < 2 \\ \frac{1}{2} + \frac{X}{8} & 2 \le X < 3 \\ 1 & X \ge 3 \end{cases} \tag{1.0.1}$$

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

2 Solution-Gate EC 58

Given F(X) is the CDF of the random variable X. $P(2 \le X < 4)$ 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,

$$P(2 \le X < 4) = \lim_{X \to 4-} F(X) - \lim_{X \to 2-} F(X) \tag{2.0.1}$$

$$= \lim_{X \to 4-} 1 - \lim_{X \to 2-} \frac{3}{5} \tag{2.0.2}$$

$$= 1 - \frac{3}{5} \tag{2.0.3}$$

$$= \frac{2}{5} = 0.4 \tag{2.0.4}$$

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

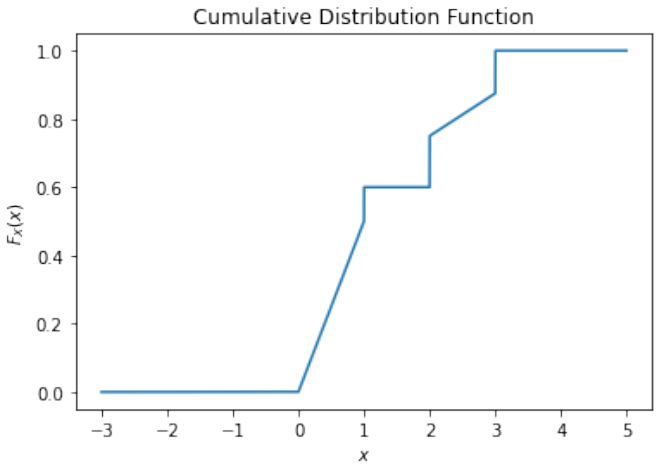

Fig. 0: CDF of X