Week 5 Homework

Probability Model and Data Analysis

Software Engineering Program,

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Homework of PMF and CDF of Discrete Random Variables

Question 1

For random variables X and R defined in Example 2.5,
1. Find the following probabilities:
(a) $P[X = 0]$
(b) $P[X < 3]$
(c) $P[R > 0]$

Answer

(a) $P[X = 0] = \frac{1}{8}$
(b) $P[X < 3] = \frac{7}{8}$
(c) $P[R > 0] = \frac{6}{8} = \frac{3}{4}$

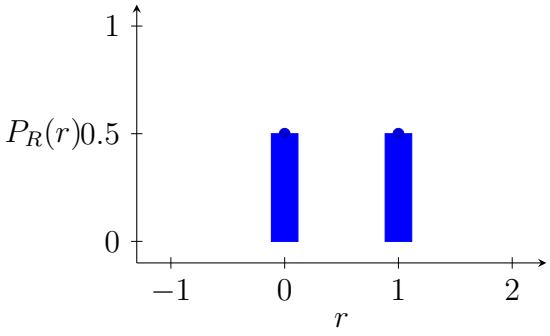
Question 2

Flip a coin and let it land on the table. Observe whether the side facing up is heads or tails. Let X be the number of heads observes

1. Find and sketch the PMF of random variable X.
2. Find and sketch the CDF of random variable X.

Solution

$$P_R(r) = \begin{cases} \frac{1}{2} & r = 0, \\ \frac{1}{2} & r = 1, \\ 0 & \text{otherwise.} \end{cases}$$



$$F_R(r) = \begin{cases} 0 & r < 0, \\ \frac{1}{2} & 0 \le r < 1, \\ 1 & r \ge 1 \end{cases}$$