ST3009: Statistical Methods for Computer Science

Week 3 Assignment - Senán d'Art - 17329580

Question 1

(a)

The event $(1, 1)$ is the only one that corresponds to $Y = 2$.

(b)

$\{(1, 2), (2, 1)\}$ correspond to $Y = 3$

(c)

$\{(1, 3), (2, 2), (3, 1)\}$ correspond to $Y = 4$

(d)

Number of total possible results: 36
Set size: 3
Probability of event: $\frac{3}{36} = \frac{1}{12}$

Question 2

$X = Head - Tails$

(a)

Possible values of X: $\{-3, -1, 1, 3\}$

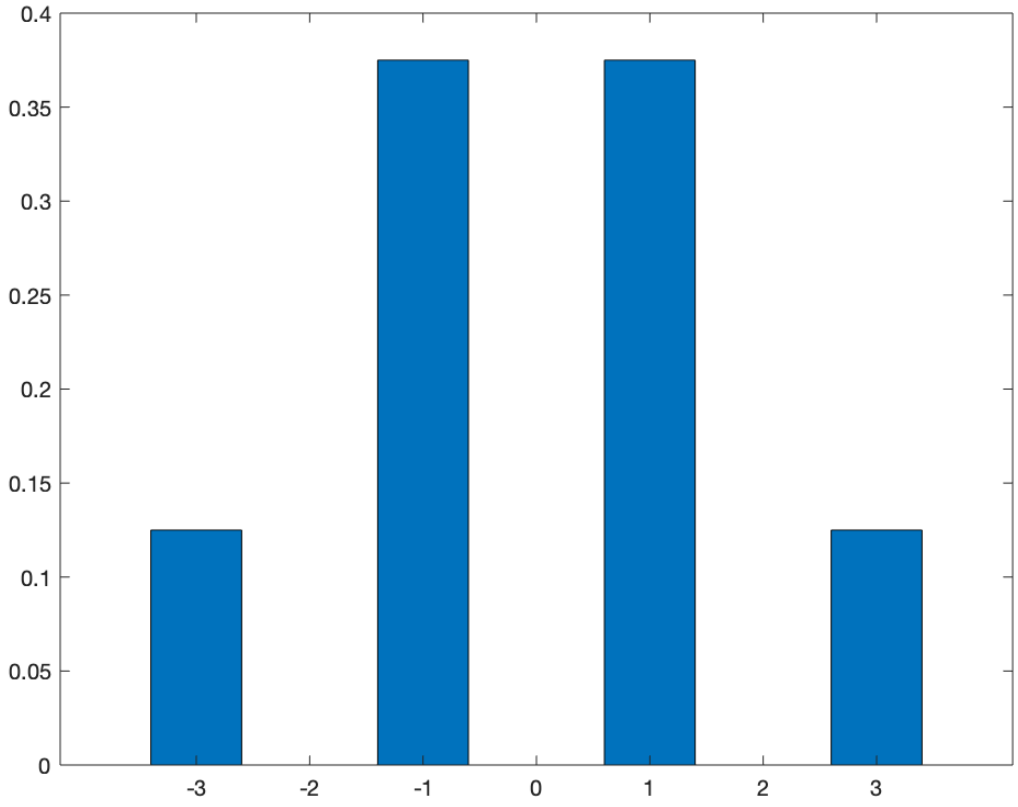
(b)

8 Total Combinations (2^3)
Only one way to roll -3 : $\{Tails, Tails, Tails\}$
Probability: $\frac{1}{8}$

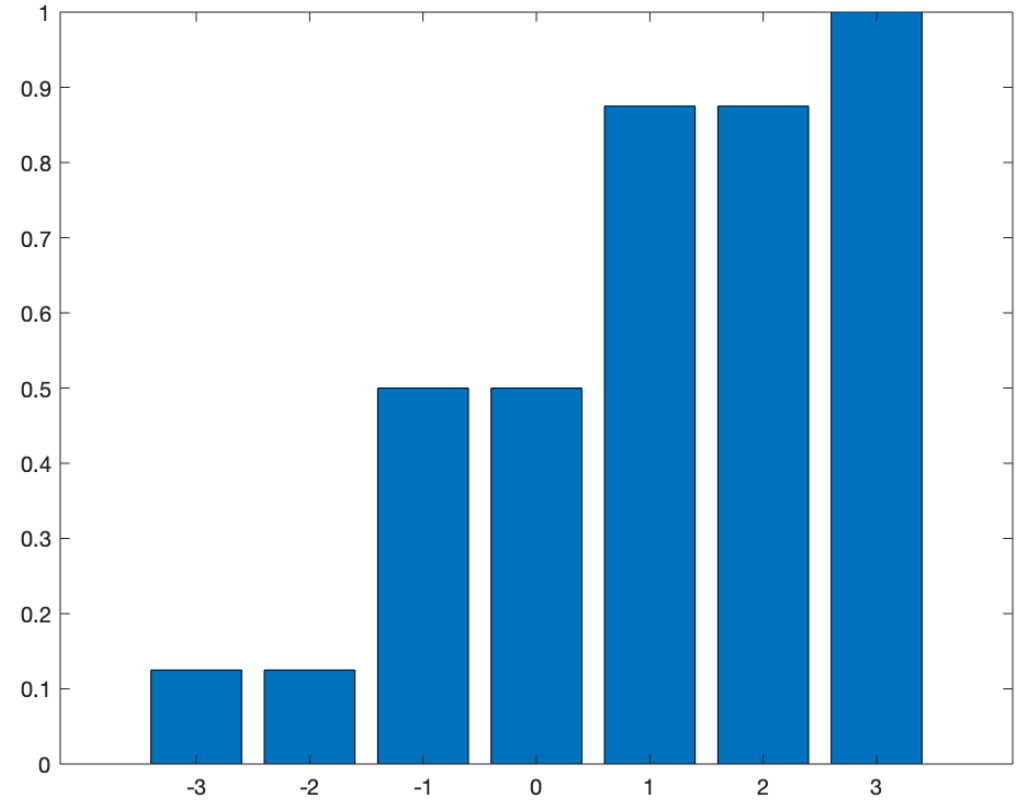
(c)

8 Total Combinations
Three ways to roll -1 : $\{[H, T, T], [T, H, T], [T, T, H]\}$
Probability: $\frac{3}{8}$

(d)



PMF of X



CDF of X

Question 3

(a)

Possible values for X are {1,2,3,4,5,6}.
X will always be >= 1.
Probability is 1.

(b)

For $X >= 2$, no ones must be rolled.

$$\frac{5}{6} * \frac{5}{6} * \frac{5}{6} * \frac{5}{6} = 0.4823$$

(c)

$$X >= 1, K = 1$$

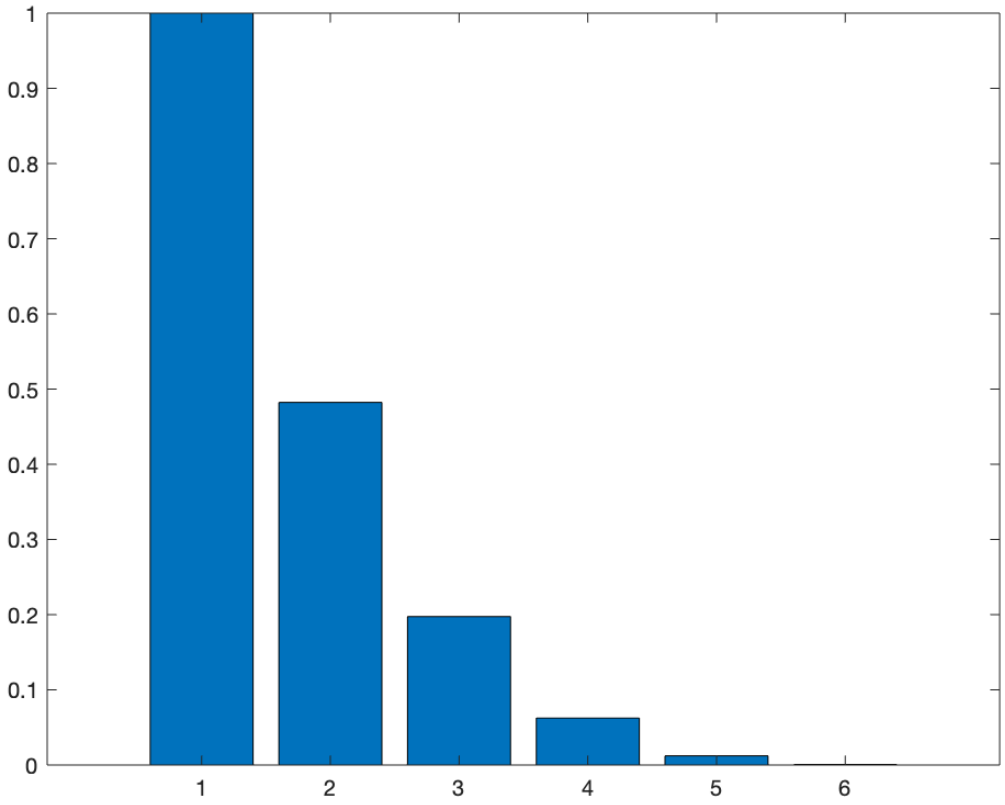
$$X >= 2, K = 0.4823$$

$$X >= 3, K = 0.1975$$

$$X >= 4, K = 0.0625$$

$$X >= 5, K = 0.0123$$

$$X >= 6, K = 0.0008$$



CDF of X