Assignment 14

K.A. Raja Babu

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1 QUESTION No. 6.17

A person plays a game of tossing a coin thrice. For each head, he is given Rs 2 by the organiser of the game and for each tail,he has to give Rs 1.50 to the organiser. Let X denote the amount gained or lost by the person. Show that X is a random variable and exhibit it as a function on the sample space of the experiment.

2 SOLUTION

Let X_1, X_2, X_3 be the three tosses of the coin and X be the total amount such that

$$X = X_1 + X_2 + X_3 \tag{2.0.1}$$

where

$$X_i = \{2, -1.5\} \tag{2.0.2}$$

From eq.(2.0.1),value of X is given by

$$X = x \in \{-4.5, -1, 2.5, 6\} \tag{2.0.3}$$

Now,probability mass function(PMF) of X using curve fitting ,is given by

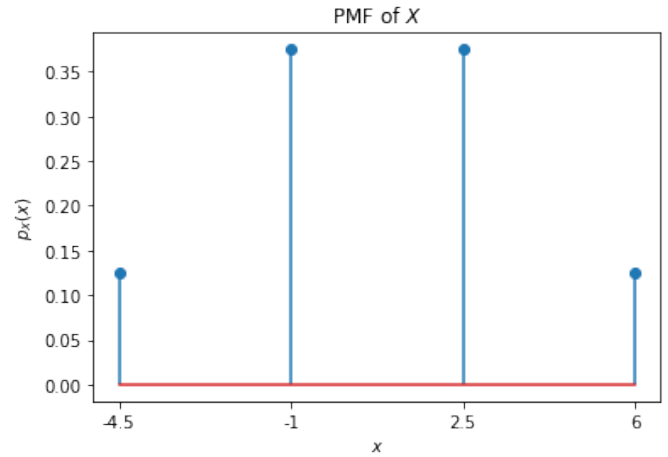$$\boxed{p_X(x) = 0.4005 + 0.0153x - 0.0102x^2} \tag{2.0.4}$$

Fig. 2.1: PMF of X