## Assignment 4 Probability and Random Variables

Swati Mohanty (EE20RESCH11007)

## I. Problem

Find the probability distribution of

- (i) number of heads in two tosses of a coin.
- (ii) number of tails in the simultaneous tosses of three coins.
- (iii) number of heads in four tosses of a coin.

## II. SOLUTION

(i)Let the event be defined as

X = Number of heads when a coin is tossed twice Outcomes ={HH,HT,TH,TT}

Hence the probability distribution of X is:

X	0	1	2
P(X)	1/4	1/2	1/2

(ii)Let the event be defined as

X = Number of tails in the simultaneous tosses of three coins.

Outcomes ={ HHH,HHT,HTH,HTT,THH,THH,TTT}

Hence the probability distribution of X is:

X	0	1	2	3
P(X)	1/8	3/8	3/8	1/8

(iii)Let the event be defined as

X =Number of heads in four tosses of a coin.

Outcomes = { HHHHH, HHHT, HHTH, HHTT, HTHH, HTHH,

HTTH,HTTT,THHH,THHT,THTH,THTT,TTHH,

TTHH,TTTH,TTTT

Hence the probability distribution of X is:

X	0	1	2	3	4
P(X)	1/16	1/4	3/8	1/4	1/16

The PDF graphs were plotted using the python code.

Download python code from here

https://github.com/Swati-Mohanty/AI5002/blob/main/Assignment 4/codes/cintoss.py

Download latex code from here-

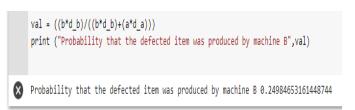


Figure 1: Result obtained from python code

https://github.com/Swati-Mohanty/AI5002/blob/main/Assignment 4/codes/assignment4.tex