

# Assignment 2

## AI1110: Probability and Random Variables

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**12.13.4.1:** State which of the following are not the probability distributions of a random variable. Give reasons for your answer.

(a)

X	0	1	2
pr(X)	0.4	0.4	0.2

(b)

X	0	1	2	3	4
pr(X)	0.1	0.5	0.2	-0.1	0.3

(c)

Y	-1	0	1
pr(Y)	0.6	0.1	0.2

(d)

Z	3	2	1	0	-1
pr(Z)	0.3	0.2	0.4	0.1	0.05

**solution:**(b), (c) and (d) do not represent the probability distribution of a random variable. probability distribution of a random variable should satisfy

(a)  $\Pr(X_i) > 0$  for all  $i = 1, 2, 3, \dots, n$

(b)  $\sum_{i=1}^{i=n} \Pr(X_i) = 1$

**Reasons:**

(a) It satisfies both conditions .So it is probability distribution of a random variable.

(b) It fails condition (a).So it is not probability distribution of a random variable.

(c) It fails condition (b).So it is not probability distribution of a random variable.

(d) It fails condition (b).So it is not probability distribution of a random variable.