

Chapter 4: Discrete Probability Distributions

random variable (x) - a variable that has a numerical value determined by chance.

$X = \#$ of heads in 2 tosses of a coin

$$X = 0, 1, 2$$

X	$P(X=x)$	
0	0.25	$\frac{1}{4}$
1	0.50	$\frac{2}{4}$
2	0.25	$\frac{1}{4}$

} probability distribution function (pdf)

Flip a coin 3 times and count the number of heads.

$X = \#$ of heads.

X	$P(X=x)$
0	$\frac{1}{8} = 0.125$
1	$\frac{3}{8} = 0.375$
2	$\frac{3}{8} = 0.375$
3	$\frac{1}{8} = 0.125$

$x =$ discrete random variable

Calculating the mean of a probability distribution

X	$P(X=x)$	$X \cdot P(x)$
0	0.25	0
1	0.50	0.5
2	0.25	0.5
		$\mu = 1$

0, 2, 1, 1, ...

↓ add

$\mu = \sum X \cdot P(X=x)$ mean of a probability distribution
(the long-run average if this experiment were carried out many, many times)

example:

x	$P(X=x)$	$X \cdot P(X=x)$
10	0.60	6
20	0.30	6
30	0.10	3
		$\mu = 15$

↓

expected value = mean

Homework: Chapter 4 1, 5, 6

(Section 4.15)