4.2 Mean or Expected Value and Standard Deviation

Section 4.2 Mean or Expected Value and Standard Deviation

Learning Objective:

In this section, you will:

• Calculate the mean and standard deviation of random variables

The **expected value** is often referred to as the "long-term" average or mean. This means that over the long term of doing an experiment over and over, you would expect this average and is denoted by the Greek letter μ.

Example 1: On average, how many times would you expect a post-op patient will ring the nurse during a 12-hour shift? What is the standard deviation?

X	P(x)
0	
1	
2	
3	
4	
5	

Example 2: A men's soccer team plays soccer zero, one, or two days a week. The probability that they play zero days is 0.2, the probability that they play one day is 0.5, and the probability that they play two days is 0.3. Find the long-term average or expected value, μ, of the number of days per week the men's soccer team plays soccer. Calculate the standard deviation of the variable as well.

Notes 4.2

Example 3: Suppose you play a game with a biased coin. You play each game by tossing the coin once. P(heads) = 2/3 and P(tails) = 1/3. If you toss a head, you pay $6. If you toss a tail, you win $10. If you play this game many times, will you come out ahead?

For more information and examples see online textbook OpenStax Introductory Statistics pages 247-253.