

Notes 12.3  
Measures of Dispersion

**Computing the range**

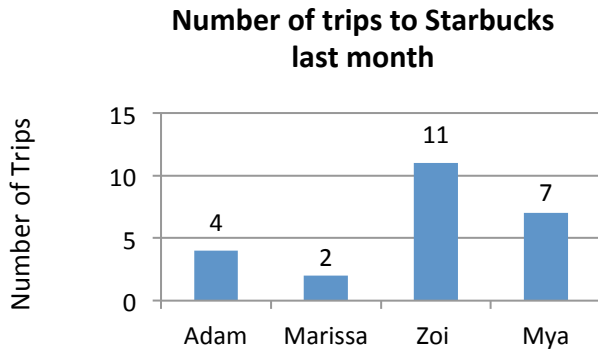


Figure 1

1) **Figure 1** shows the number of trips to Starbucks last month for four people. Find the range for the number of trips for these four people.

**Preparing to Find the Standard Deviation; Finding Deviations from the Mean**

2) Find the deviations from the mean for the five data items 4, 2, 11, 7 shown in **Figure 1**.

### COMPUTING THE STANDARD DEVIATION FOR A DATA SET

1. Find the mean of the data items.

2. Find the deviation of each data item from the mean:

$$\text{data item} - \text{mean}.$$

3. Square each deviation:

$$(\text{data item} - \text{mean})^2.$$

4. Sum the squared deviations:

$$\Sigma(\text{data item} - \text{mean})^2.$$

5. Divide the sum in step 4 by  $n - 1$ , where  $n$  represents the number of data items:

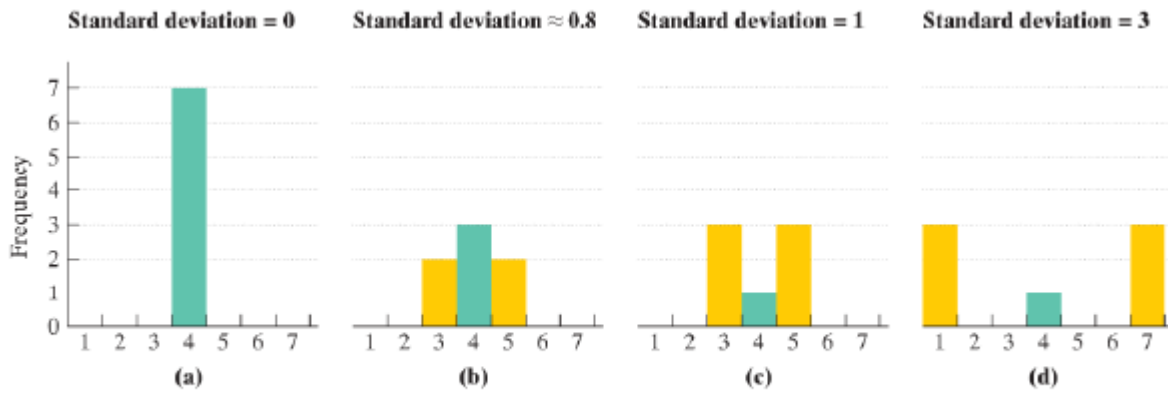
$$\frac{\Sigma(\text{data item} - \text{mean})^2}{n - 1}.$$

6. Take the square root of the quotient in step 5. This value is the standard deviation for the data set.

$$\text{Standard deviation} = \sqrt{\frac{\Sigma(\text{data item} - \text{mean})^2}{n - 1}}$$

#### Computing the Standard Deviation

3) Find the standard deviation for the five data items 4, 2, 11, 7 shown in **Figure 1**. Round to two decimal places.



**FIGURE 12.8** The standard deviation gets larger with increased dispersion among data items. In each case, the mean is 4.

### Computing the Standard Deviation

Find the standard deviation of the data items in each of the samples shown below. Round to two decimal places.

Sample A: 73, 75, 77, 79, 81, 83

Sample B: 40, 44, 92, 94, 98, 100

5) Shown below are the means and standard deviations of the yearly returns on two investments from 1926 through 2004.

Investment	Mean Yearly Return	Standard Deviation
Small-Company Stocks	17.5%	33.3%
Large-Company Stocks	12.4%	20.4%

- Use the means to determine which investment provided the greater yearly return.
- Use the standard deviations to determine which investment had the greater risk. Explain your answer.

### Using the Graphing Calculator to find Standard Deviation

Find the standard deviation for the following set of data: 778, 472, 147, 106, 82.

Stat Edit

**L1**  
778  
472  
147  
106  
82

Stat Calc

#### 1: 1-var Stats

Mean  $\bar{x} =$

Sum of the data values  $\sum x =$

Standard Deviation  $S_x =$

Number of data values  $n =$