

 **DEFINITION**

A **frequency distribution** (or **frequency table**) shows how a data set is partitioned among all of several categories (or classes) by listing all of the categories along with the number of data values in each of the categories.

Consider pulse rate measurements (in beats per minute) obtained from a simple random sample of 40 males and another simple random sample of 40 females, with the results listed in Table 2-1 (from Data Set 1 in Appendix B). Our pulse is extremely important, because it's difficult to function without it! Physicians use pulse rates to assess the health of patients. A pulse rate that is abnormally high or low suggests that there might be some medical issue; for example, a pulse rate that is too high might indicate that the patient has an infection or is dehydrated.

Table 2-1 Pulse Rates (beats per minute) of Females and Males

Females																			
76	72	88	60	72	68	80	64	68	68	80	76	68	72	96	72	68	72	64	80
64	80	76	76	76	80	104	88	60	76	72	72	88	80	60	72	88	88	124	64
Males																			
68	64	88	72	64	72	60	88	76	60	96	72	56	64	60	64	84	76	84	88
72	56	68	64	60	68	60	60	56	84	72	84	88	56	64	56	56	60	64	72

Table 2-2 is a frequency distribution summarizing the pulse rates of females listed in Table 2-1. The **frequency** for a particular class is the number of original values that fall into that class. For example, the first class in Table 2-2 has a frequency of 12, indicating that 12 of the original pulse rates are between 60 and 69 beats per minute.

Some standard terms used in discussing and constructing frequency distributions are defined here.

Table 2-2 Pulse Rates of Females

Pulse Rate	Frequency
60-69	12
70-79	14
80-89	11
90-99	1
100-109	1
110-119	0
120-129	1

 **DEFINITION**

Lower class limits are the smallest numbers that can belong to the different classes. (Table 2-2 has lower class limits of 60, 70, 80, 90, 100, 110, and 120.)

Upper class limits are the largest numbers that can belong to the different classes. (Table 2-2 has upper class limits of 69, 79, 89, 99, 109, 119, 129.)

Class boundaries are the numbers used to separate the classes, but without the gaps created by class limits. Figure 2-2 shows the gaps created by the class limits from Table 2-2. In Figure 2-2 we see that the values of 69.5, 79.5, . . . , 119.5 are in the centers of those gaps. These are the class boundaries. Following the pattern established, we see that the lowest class boundary is 59.5, and the highest class boundary is 129.5. So, the complete list of class boundaries is 59.5, 69.5, 79.5, . . . , 119.5, 129.5.

Class midpoints are the values in the middle of the classes. (Table 2-2 has class midpoints of 64.5, 74.5, 84.5, 94.5, 104.5, 114.5, and 124.5.) Each class midpoint is found by adding the lower class limit to the upper class limit and dividing the sum by 2.

Class width is the difference between two consecutive lower class limits or two consecutive lower class boundaries in a frequency distribution. (Table 2-2 uses a class width of 10.)