Chapter 2 Summarizing Data

Section 2 - 1A: Frequency Distributions and Frequency Tables for Discrete Quantitative Data

A **Frequency Distribution** or **Frequency Table** is a table that lists all the different data values in the left column and the total number of times (the frequency) that each of the different data values occurs in the right column.

The **left column** has a **heading** that describes what the data represents. We attach a variable x to this heading. The variable x will represent all the different **possible discrete numerical values** the data can contain.

The right column contains **the frequency for each different x values. The frequency is the number of times that each of the different discrete numerical values occurs**. We use the notation Freq (x) to represent the frequency for any specific x value from column one.

The total of the **all the numbers in the second column** will be the total number of data in the distribution. This means that if we have 25 data bits then the total of the Freq(x) column will be 25.

An Example of a Frequency Table

x = number of children in your family	freq (x)
0	2
1	6
2	4
3	2
4	1
5	3
6	7

We use the symbol $\sum$ to represent the total of a group of numbers. The symbol $\sum \text{freq}(x)$ represents the total of all the numbers in the freq(x) column. The value obtained for $\sum \text{freq}(x)$ will represent **the total number of data bits in the data set.**

$\sum \text{freq}(x) = 2 + 6 + 4 + 2 + 1 + 3 + 7 = 25$ The total number of data bits in the data set is 25.

Interpreting a Frequency Table

The **first column** has a **heading of the number of children in your family.** This means that a group of people were asked the number of children in their family. From the values of x in Column One we can see that there were some people who said they had 0 children in their family and some that said the had 1, and so on up to some that said they had 6 children in their family. Column One shows that the range of **possible x values** are the discrete numbers 0, 1, 2, 3, 4, 5, 6.

The **second column** has a **heading freq (x).** The second column contains the **frequency** or number of times that each of the different x values occurs. The chart to the right of the frequency table below shows how to interrupt the numbers in the two columns of the frequency table.

x = number of children in your family	freq (x)	
0	2	2 people reported 0 children in the family
1	6	6 people reported 1 children in the family
2	4	4 people reported 2 children in the family
3	2	2 people reported 3 children in the family
4	1	1 person reported 4 children in the family
5	3	3 people reported 5 children in the family
6	7	7 people reported 6 children in the family

$$\sum \text{freq}(x) = 2 + 6 + 4 + 2 + 1 + 3 + 7 = 25$$

Example 1

Each of the 20 students in my Calculus class reported the number of cars that their family owns. The data below represents the data for each student.

0 2 3 3 1 2 3 4 3 1 2 3 3 2 2 4 2 2 4 4

we will let x = the number of cars owned

We want to know how many times 0,1, 2, 3, and 4 occur in the data set. We can do this with "tally marks" or just count the number of times each numbers occurs. The use of a tally is optional but is shown below

Tallies

0: 𝍸 **1**: 𝍸 | **2**: 𝍸 || **3**: 𝍸 ||| **4**: 𝍸 ||||

The **first column** has a **heading of the number of cars your family owns.** We can see from the the data that the values for x in column one are the discrete numbers 0, 1, 2, 3, 4.

The **second column** has a **heading freq (x).** The second column contains the **frequency** or number of times that each of the different x values occurs.

x = number of cars owned by your family	**freq (x)**
0	1
1	2
2	7
3	6
4	4

$$\sum \text{freq}(x) = 1 + 2 + 7 + 6 + 4 = 20$$

