Section 2.2 -- Quantitative Data Sets

Part 2
Displaying Quantitative Data

There are three main ways to display quantitative data:

- Dotplots
- Stemplots
- Histograms (we will learn this next class)

Do you remember what Quantitative Data are?
Dotplots

One of the simplest graphs to construct and interpret is a **dotplot**. Each data value is shown as a dot above its location on a number line.

**How to create a dotplot:**
1) Draw a horizontal axis (a number line) and label it with the variable name.
2) Scale the axis from the minimum to the maximum value.
3) Mark a dot above the location on the horizontal axis corresponding to each data value.
Example: Create a dotplot with the data on teacher's age from your classes' survey.
Stemplots (Stem-and-Leaf Plots)

Another simple graphical display for small data sets is a stemplot.

Stemplots give us a quick picture of the distribution while including the actual numerical values.
How to make a stemplot:

1) Separate each observation into a **stem** (all but the final digit) and a **leaf** (the final digit).

2) Write all possible stems from the smallest to the largest in a vertical column and draw a vertical line to the right of the column.

3) Write each leaf in the row to the right of its stem. Arrange the leaves in increasing order out from the stem.

4) Provide a key that explains in context what the stems and leaves represent.
Example:

These data represent the responses of 20 female Statistics students to the question, “How many pairs of shoes do you have?” Construct a stemplot.

<table>
<thead>
<tr>
<th>50</th>
<th>26</th>
<th>26</th>
<th>31</th>
<th>57</th>
<th>19</th>
<th>24</th>
<th>22</th>
<th>23</th>
<th>38</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>50</td>
<td>13</td>
<td>34</td>
<td>23</td>
<td>30</td>
<td>49</td>
<td>13</td>
<td>15</td>
<td>51</td>
</tr>
</tbody>
</table>
Splitting Stems and Back-to-Back Stemplots

When data values are “bunched up”, we can get a better picture of the distribution by splitting stems.

Two distributions of the same quantitative variable can be compared using a back-to-back stemplot with common stems.
Split Stems

1. After you have determined the stems you are using - list them as you did before, but this time write each time twice.

2. For the first time the stem appears list ONLY the leaves between 0 and 4.

3. For the second time that the stem appears, list the leaves between 5 - 9.

4. Don't forget to list the leaves in increasing order and to use a key.
Create a stemplot with split stems from our survey data on GPAs.
Back-to-back Stemplots

1. You use this when you want to compare the distribution of a variable for two separate groups.

2. You use the same stems for both groups - so be sure to pick the minimum out of all of the data and the maximum as well. Use these for the lowest stem and the highest stem.

3. The leaves still extend from the stems - however the stems are listed in the middle of the table with one group's leaves extending to the right and the other to the left.

4. Don't forget to list the leaves in increasing order and to use a key.
Construct a back-to-back stemplot for the data below on the number of pairs of shoes female and male high school students own.

<table>
<thead>
<tr>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 26 26 31 57 19 24 22 23 38</td>
<td></td>
</tr>
<tr>
<td>14 7 6 5 12 38 8 7 10 10</td>
<td></td>
</tr>
<tr>
<td>13 50 13 34 23 30 49 13 15 51</td>
<td></td>
</tr>
<tr>
<td>10 11 4 5 22 7 5 10 35 7</td>
<td></td>
</tr>
</tbody>
</table>