Review for Test 1 on Chapters 1 and 2
Data Sheet Review
Triola Review Sheet
**Box plot or box and whisker plot** is a graph of data revealing the central tendency, spread of data, distribution of data and presence of outliers (extreme scores). A box plot is very useful when comparing 2 or more data sets.
Use the data below (from the Frequency Table Worksheet) to graph a box plot.
Lori asked 24 students how many hours they had spent doing homework during the previous week. The results are shown below.

<table>
<thead>
<tr>
<th>11</th>
<th>10</th>
<th>11</th>
<th>9</th>
<th>11</th>
<th>11</th>
<th>15</th>
<th>13</th>
<th>11</th>
<th>8</th>
<th>12</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>13</td>
<td>10</td>
<td>12</td>
<td>13</td>
<td>9</td>
</tr>
</tbody>
</table>
The survival time of US Presidents in years from their inauguration for the 35 presidents from George Washington (10 years) to Lyndon Johnson (9 years) are given here.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>29</td>
<td>26</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>23</td>
<td>17</td>
<td>25</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>34</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>17</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>12</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>21</td>
<td>11</td>
<td>2</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>12</td>
<td>28</td>
<td>3</td>
<td>16</td>
<td>9</td>
</tr>
</tbody>
</table>
Exploratory Data Analysis

the process of using statistical tools (such as graphs, measures of center, and measures of variation) to investigate the data sets in order to understand their important characteristics
Boxplots

(Box-and-Whisker Diagram)

Reveals the:

- center of the data
- spread of the data
- distribution of the data
- presence of outliers

Excellent for comparing two or more data sets
Boxplots

5 - number summary

- Minimum
- first quartile $Q_1$
- Median ($Q_2$)
- third quartile $Q_3$
- Maximum
Boxplot of Qwerty Word Ratings

Q₁, med, Q₃

3, 7, 18

min, max

3, 7, 18
43, 22, 16, 14, 15, 20, 21, 19

<table>
<thead>
<tr>
<th>Stem</th>
<th>Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1, 6, 4, 5, 9</td>
</tr>
<tr>
<td>2</td>
<td>2, 0, 1</td>
</tr>
<tr>
<td>3</td>
<td>4, 3</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stem</th>
<th>Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4, 5, 6, 9</td>
</tr>
<tr>
<td>2</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>3</td>
<td>3, 4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>
Draws | Frequency
-----|-------
0-9  | 11    
10-19| 13    
20-29| 9     
30-39| 2     

\[ \bar{x} = 15.07 \]
\[ s^2 = 9.06 \]
\[ s = 8.93 \]
\[ \chi^2 = 14.5 \]
\[
S = \sqrt{\frac{\sum (x - \overline{x})^2}{n-1}}
\]

\[x \]

2
3
7
9
81

SRS
Exploring

- Measures of center: mean, median, and mode
- Measures of variation: Standard deviation and range
- Measures of spread and relative location: minimum values, maximum value, and quartiles
- Unusual values: outliers
- Distribution: histograms, stem-leaf plots, and boxplots
Mat 131: Important Concepts for Test 1

Definitions:
  Populations
  Samples
  Sampling
  Level of Measurement
Symbols
Sample Data: how to calculate and meaning
  Mean
  Median
  Mode
  Midrange
  Range
  Standard Deviation
  Variance
  Q1
  Q3
Skewness
Box-Whiskers
Z score
Frequency Table
  Mean
  Standard Deviation
  Variance
Range Rule of Thumb
<table>
<thead>
<tr>
<th>Data Sets</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>St Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = {2, 3, 4, 5, 6, 14, 15, 16, 17, 18}</td>
<td>5.25</td>
<td>5</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>B = {2, 10, 10, 10, 10, 10, 10, 10, 10, 18}</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>3.77</td>
</tr>
<tr>
<td>C = {2, 2, 2, 2, 3, 16, 18, 18, 18, 18}</td>
<td>7.7</td>
<td>9.5</td>
<td>18</td>
<td>4.14</td>
</tr>
<tr>
<td>D = {2, 3, 5, 5, 6, 10, 15, 18, 18, 18}</td>
<td>10</td>
<td>8</td>
<td>18</td>
<td>6.63</td>
</tr>
<tr>
<td>E = {2, 4, 10, 10, 10, 10, 10, 10, 16, 18}</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>4.7</td>
</tr>
<tr>
<td>F = {2, 4, 8, 9, 10, 10, 12, 16, 18}</td>
<td>9.89</td>
<td>10</td>
<td>10</td>
<td>5.11</td>
</tr>
<tr>
<td>G = {8, 9, 9, 9, 10, 10, 10, 11, 11, 12, 13}</td>
<td>10.17</td>
<td>10</td>
<td>10</td>
<td>1.41</td>
</tr>
<tr>
<td>H = {52, 53, 55, 55, 56, 60, 65, 68, 68, 68}</td>
<td>60</td>
<td>58</td>
<td>68</td>
<td>6.63</td>
</tr>
<tr>
<td>J = {8, 8, 9, 9, 9, 11, 11, 11, 11, 11}</td>
<td>9.8</td>
<td>10</td>
<td>11</td>
<td>1.32</td>
</tr>
</tbody>
</table>
Questions