Chapter 5: Statistics

5.2 Histograms and Frequency Polygons

Frequency Distribution:

Histogram:

Frequency Polygon:

Example 1: Analysing test scores

<table>
<thead>
<tr>
<th>Score</th>
<th>Tally</th>
<th>Frequency</th>
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Example 1: Average Incomes in Canada

Draw a graph and find the mean and median
Example #2: Chilliwack River
River flow rate in June (measured at Vedder Crossing) in m$^3$/s

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<tr>
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<td>102</td>
<td>124</td>
<td>170</td>
<td>188</td>
<td>152</td>
<td>125</td>
<td>104</td>
<td>135</td>
<td>105</td>
<td>184</td>
<td>128</td>
<td>95</td>
<td>189</td>
<td>125</td>
<td>129</td>
<td>213</td>
<td>151</td>
<td>152</td>
<td>129</td>
<td>157</td>
<td>223</td>
<td>107</td>
<td>243</td>
<td>165</td>
<td>141</td>
<td>105</td>
<td>119</td>
<td>88</td>
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Step #1: Find the Range:

Step #2: Choose Even Categories

Step #3: Make Frequency Chart

Source: Environment Canada
Step #4: Draw Histogram or Frequency Chart

Step #5: Find Mean/Median/Mode
Assignment:
1) Jerry uses the Internet to help him complete his homework. He recorded the time he spent online each day for one month. He grouped the data in a frequency table.

<table>
<thead>
<tr>
<th>Internet Time (h)</th>
<th>Frequency</th>
</tr>
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<tbody>
<tr>
<td>0.5-1.0</td>
<td>0</td>
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<tr>
<td>1.0-1.5</td>
<td>4</td>
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<tr>
<td>1.5-2.0</td>
<td>6</td>
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<tr>
<td>2.0-2.5</td>
<td>7</td>
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<tr>
<td>2.5-3.0</td>
<td>8</td>
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<tr>
<td>3.0-3.5</td>
<td>1</td>
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<tr>
<td>3.5-4.0</td>
<td>1</td>
</tr>
<tr>
<td>4.0-4.5</td>
<td>1</td>
</tr>
<tr>
<td>4.5-5.0</td>
<td>0</td>
</tr>
<tr>
<td>5.0-5.5</td>
<td>2</td>
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<tr>
<td>5.5-6.0</td>
<td>1</td>
</tr>
</tbody>
</table>

Use the grid provided to create a frequency polygon representing the data. Describe how the data is distributed.
2) A Macintosh apple orchard has 40 trees with these heights, given in metres.

1.1 1.3 1.4 1.2 1.5 1.7 1.6 1.3
1.5 2.0 2.1 1.8 1.9 2.3 2.2 2.1
1.7 2.0 2.2 2.5 2.3 2.4 1.9 1.8
3.1 3.2 3.3 2.7 2.8 2.6 2.5 2.3
3.0 2.4 2.7 2.4 2.6 2.8 2.2 2.1

Complete this frequency table to organize the heights into eight equal intervals.

<table>
<thead>
<tr>
<th>Height (m)</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>1.0-1.3</td>
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<td>1.3-1.6</td>
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Use the grid provided to construct a histogram of the data.

Which range of heights occurs most frequently? _______
Which occurs least frequently? ___________
3) Farooq is an apprentice at a bakery. The times he spends after school at the bakery, in hours, over one month are shown.

<table>
<thead>
<tr>
<th>Time (h)</th>
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<tbody>
<tr>
<td>2.5 3.0 3.5 4.0 5.0 5.0</td>
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<tr>
<td>1.5 2.0 3.0 3.0 5.0 6.0</td>
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<tr>
<td>1.0 2.5 2.5 2.5 4.0 4.0</td>
</tr>
<tr>
<td>3.0 3.0 3.0 2.0 3.5 7.0</td>
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<tr>
<td>3.0 2.0 2.5 2.5 7.0 8.0</td>
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</tbody>
</table>

Decide on an interval and make a frequency distribution table.

<table>
<thead>
<tr>
<th>Height (m)</th>
<th>Frequency</th>
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Use the grid provided to construct a histogram of the data.
4) Tamiko works after school at her father’s convenience store. The hours she worked some days after school and on weekends in February are shown.

2.0 2.5 3.0 4.0 2.0 2.5 3.5 4.0
3.0 2.5 3.0 4.0 1.0 0.5 2.5 3.0
5.0 7.0 4.5 6.0 3.5 4.0 8.0 7.5

Decide on an interval and make a frequency distribution table.

<table>
<thead>
<tr>
<th>Hours (h)</th>
<th>Frequency</th>
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Use the grid provided to construct a frequency polygon of the data.

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Answer Key