Histograms

A histogram is suitable for displaying quantitative data.

Example 1
In a survey of 20 patients who smoked, the following data were obtained. Each value represents the number of cigarettes the patient smoked per day. Construct a frequency histogram.

\[ 10 \quad 8 \quad 6 \quad 14 \quad 22 \quad 18 \quad 14 \quad 13 \quad 12 \quad 15 \]
\[ 13 \quad 17 \quad 19 \quad 11 \quad 9 \quad 15 \quad 5 \quad 11 \quad 16 \quad 11 \]

1. Enter the quantitative data in column A.

2. Click on Tools, select Data Analysis and select Histogram. Click OK.

3. Input Range: select the cells containing the data in column A.

4. Bin Range is optional—the bin range gives the upper class limits. Use this if you wish to create a histogram with certain classes or a certain number of classes; however, using the bin range does give you more control over the appearance of the histogram. The bin range values would correspond to the upper class limits of the associated frequency distribution. Enter these values in a column and use these cells as the bin range.

The upper limits of a five-class frequency distribution would be 8, 12, 16, 20, 24, as can be seen from the following frequency table.

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\(^1\)If Data Analysis is not shown, select Tools, Add-Ins and check Analysis ToolPak. Click OK.
5. Select **Output Range:** and then select a blank cell in the current worksheet for the output to appear. Check **Chart Output**
6. Click **OK**. You should now see the table containing the bin values and frequencies, and the chart—the bars will have gaps between them and the chart will usually be smaller than you want. Notice that Excel has

<table>
<thead>
<tr>
<th>Bin</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>More</td>
<td>0</td>
</tr>
</tbody>
</table>

7. Right click on one of the bars. Select **Format Data Series** ..., and then **Options**. Go to **Gap width**: and choose a gap width of 0. Click **OK**. There should now be no space between the bars of the histogram.

8. Right click on the white or light blue area around the bars. Select **Chart Options**. Click the **Title** tab. Give your chart a title and an X-axis label (the variable name). Click the Legend tab and uncheck the **Show Legend** box. Click the **Data Labels** tab and check **Value**. Click **OK**.

9. Click on the white chart area to create ‘handles’ (small black squares at each corner and in the middle of the top and bottom). You can click on one these handles to ‘stretch’ or ‘shrink’ your graph to the desired size. Change the width and length to produce a nice size histogram.
10. The histogram procedure incorrectly adds an additional class ‘More’ to the frequency distribution. To eliminate the class ‘More’, select the two cells containing ‘More’ and ‘0’, select Edit and then Delete (or right-click on the highlighted cells and select Delete). In the Delete dialog box select the Shift cells up option button and click OK.