

EXERCISE 6

Charts and graphs

Opening SPSS

Open the data file *Metric Data* which you saved in the previous Exercise.

Charts and graphs

1) Stem-and-leaf plot and boxplot

Use the **Explore...** procedure (Section 4.3.2) to produce stem-and-leaf plots and boxplots of *Metres* categorised by *Sex*. Once you are in the **Explore** dialog box, remember to click the **Plots** radio button at the bottom left to suppress the Statistics output. Click **Plots...**, ensure that **Stem-and-leaf** has been selected (if not, click the check-box) and return to the **Explore** dialog box by clicking **Continue**. Enter the variable name *Case* into the **Label Cases by...** box.

The **stem-and-leaf plot** provides more information about the original data than does a histogram. As in a histogram, the length of each row corresponds to the number of cases that fall into a particular interval. However, the stem-and-leaf plot represents each case with a numeric value that corresponds to the actual observed value. This is done by dividing observed values into two components – the leading digit or digits, called the **stem**, and a trailing digit, called the **leaf**. For example, the value 64 would have a stem of 6 and a leaf of 4. In the case of heights in metres, the stems are the metres expressed to the first decimal place, the leaves are the second decimal place. Thus the **modal** height (i.e. the most frequent height) for males is shown with a stem of 17 (1.7 metres), the leaves being the second decimal place. If there are too many 'leaves' for one stem, the stem is repeated in further rows.

The **boxplot** is another type of display, which is more fully explained in Section 4.3.2. The central box spans 50% of the cases (those between the upper and lower quartiles) and the extensions (**whiskers**) cover the remaining cases, excluding **outliers** (shown as o's) or **extreme scores** (shown as asterisks).

- **Prepare the boxplot for printing in black-and-white, and print the Output.**
- **Within the female group, which stem contains the most leaves?**

Examine the boxplot for males and note the case numbers of the outliers so that you can check their actual heights in the data set. To locate a specific case in the data set, select **Edit→Go to Case ...** to obtain the **Go to Case** dialog box. You then enter the required case number and click **OK**.

- **Write down the actual heights of the males identified as outliers on the box plots.**


2) Bar charts

Plot a bar chart of the mean number of cigarettes smoked (*NpDay*) categorised by *Sex* and by *Faculty*. Do this by choosing **Graphs**→**Chart Builder**→**Bar** and select the second chart (Clustered Bar) to highlight it (see Section 5.2.2). Drag it to the Chart preview above. Click and drag the appropriate variable names to the boxes (*NpDay* to Y-Axis; *Faculty* to X-Axis; *Sex* to Cluster on X: set color). Add a title by choosing Title/Footnotes from the Gallery, clicking the checkbox for Title 1, entering a title into the Content box within the **Element Properties** dialog box and clicking **Apply**. Finally click **OK** in the **Chart Builder** dialog box to draw the bar chart.

In the **SPSS Viewer** window you should see a bar chart arranged by Faculty, with each cluster consisting of two bars representing Males and Females. Apparently there are no cases in the Faculty named Other).

Now specify a chart with two clusters (Sex) of three (Faculty) instead of three clusters (Faculty) of two (Sex). This can be done by returning to the **Chart Builder** dialog box and changing *Sex* and *Faculty* around (drag one of the names back to the **Variables** list; drag the other to the vacated variable box in the Chart preview and then drag the remaining variable name to the other vacated variable box).


Try changing the colours into black-and-white **Fill Patterns**. This is a two-stage procedure involving changing each colour to white and then selecting a different fill pattern for each. Follow the steps described in Section 5.2.5.

Finally return the edited bar chart to the **SPSS Viewer** by closing the **Chart Editor** (by clicking  in the top right-hand corner). Try printing the edited bar chart from the **SPSS Viewer**.

Pie chart

Draw a pie chart (see Section 5.5) for the *Status* variable and give the chart a title, including your **own** name in the title (e.g. Pie Chart of Status produced by Mary Smith).

To show the count in each slice (or perhaps the percentage), proceed as follows:

- Double-click near the pie chart to open the **Chart Editor** window.
- Click on one of the pie slices to highlight them with a purple frame.
- Select the icon  on the top toolbar (bars with label boxes in them and called **Show Data Labels**) or alternatively click the **Elements** drop-down menu and select **Show Data Labels** to open the **Properties** dialog box.
- Something will now appear in each slice (it may be a count or a percentage depending on what is displayed in the Displayed panel within the **Properties** dialog box).
- To change the information displayed (e.g. percentages instead of counts), proceed as follows:
 - Return to the **Properties** dialog box (ensuring that the **Data Value Labels** tab at the top of the **Properties** dialog box is current) and delete whatever slice label is not required from the Displayed panel by highlighting it and then clicking the red X on the right.
 - To insert other slice labels, choose and highlight one or more of the labels in the Not Displayed panel and click the green arrow on the right to transfer the labels to the Displayed panel. Finally click **Apply** and **Close** to close the **Properties** dialog box.

Try the following:

- **Edit the chart to make it suitable for black-and-white printing.**

Return the edited pie chart to SPSS Viewer by closing the Chart Editor in the usual way.

- **Print the pie chart.**

Finishing the session

Close down SPSS and any other windows before logging out of the computer.