must be hand-drawn rather than computer-generated. Describe the general characteristics of this data set. [4]

(iii) Find the sample mean and sample standard deviation for the twelve data points. [2]

(b) The data set `mouse` included in the SSC data subdirectory gives the survival times after surgery (in days) for sixteen mice. Seven of the mice (`mT`) were treated prior to the surgery with a procedure that, it was thought, might prolong survival times; the other nine were part of a control group (`mC`) and were not given the treatment.

Compare the mean survival times for the two groups, and comment on any difference evident between them. Then provide a comparative boxplot for the two groups, and say whether this offers any further useful insight into this investigation. [5]

Later in the course, in Chapters 8 and 9, you will see how to compare two groups using more formal statistical techniques.

(c) The computer program SSC offers precision in its results up to about 15 significant figures. Some computer programs can provide accuracy up to 1000 significant figures or more, depending on the user's requirements. However, there is a time penalty: the user may have to wait several minutes for the machine to provide the answer, depending on the technical specification of the machine. The data set `calctime` in the SSC data subdirectory gives the time taken (in seconds) for a low specification machine to provide accuracy to varying precision up to 1000 significant figures. In each case the same question was posed, and sometimes the same desired accuracy was stated.

(i) Draw a scatter plot of the computation time (`secs`) against the stipulated precision (`digits`) and comment in general terms on the nature of any dependence evident between the two variables. *Only a sentence or two is required here.* [2]

(ii) You have seen how it is sometimes useful to transform data vectors to provide further insight into the nature of the variation exhibited in a statistical experiment. Explore the possible logarithmic transformations by trying scatter plots of the style

```
plot(log(secs),digits)
plot(secs,log(digits))
plot(log(secs),log(digits))
```

and say whether any of these provides a more helpful insight into the relationship between the two variables than the plot in part (c)(i). [4]

You might find the following undocumented SSC command useful. In SSC32 the high resolution plots take a small amount of time to be generated, and this pause can sometimes be irritating. The command `res()` *(without arguments) toggles between high- and low-resolution plots. Use it once and the default presentation changes from high to low; use it again and you are back where you started.*

(iii) Fit a straight line by eye to whichever scatter plot you find the most useful linear representation of these data and include this augmented plot with your answer. Use your straight line to answer the following question: by inference from these data, how long would it have taken for the computer to produce accuracy to 800 digits? [6]

Only a rough assessment is required here: indeed, limits on printing resolution will probably constrain you to a rough assessment. Later in the course in Chapter 10 you will see how to fit the 'best' straight line through a set of data points, and how to use the straight line to make predictions.