

*All assignments are to be handed in during class, or to Ross personally.
Do not hand them in at the resource centre.*

You can find the data sets for this assignment under the class homepage under the names `hibernation.R` and `brainsize.R`. You can either paste the contents of these files directly into R to create variables you can use to do this assignment or you can use the following commands to read the data directly over the network.

```
> source("http://www.stat.auckland.ac.nz/~ihaka/120/Data/hibernation.R")  
> source("http://www.stat.auckland.ac.nz/~ihaka/120/Data/brainsize.R")
```

1. The data in the hibernation data set give the percentage of time spent in hibernation and the total life span for 144 hamsters. The data set contains two variables: `Hib`, which gives the percentage of time the hamster spent hibernating, and `Age` which gives the final lifespan of the hamster in days.

Investigate the relationship between hibernation and lifespan.

Note: You will need to put some thought into this. It is not just a matter of producing one or two plots.

2. Willerman et al. (1991) collected a sample of 40 right-handed Anglo introductory psychology students at a large southwestern university. Subjects took four subtests (Vocabulary, Similarities, Block Design, and Picture Completion) of the Wechsler (1981) Adult Intelligence Scale-Revised. The researchers used Magnetic Resonance Imaging (MRI) to determine the brain size of the subjects. Information about gender and body size (height and weight) are also included. The researchers withheld the weights of two subjects and the height of one subject for reasons ofThe `brainsize` data set contains a data frame consisting of the following variables:

| <i>Variable</i> | <i>Explanation</i> |
|-----------------|---|
| Gender | Male or Female |
| FSIQ | Full Scale IQ scores |
| VIQ | Verbal IQ scores |
| PIQ | Performance IQ scores |
| Weight | body weight in pounds |
| Height | height in inches |
| MRICount | total pixel Count from the 18 MRI scans |

Reference:

Willerman, L., Schultz, R., Rutledge, J. N., and Bigler, E. (1991), "In Vivo Brain Size and Intelligence," *Intelligence*, **15**, 223-228.

1. Use boxplots to see whether there are gender differences in the three IQ scores.
2. Use a trellis plot to see whether the relationship between height and weight is gender dependent.
3. Use a trellis plot to see whether the the relationship between IQ and brainsize (as measured by MRIcount) is gender dependent.