MAS115 R programming
Lab Class 6
Solutions

1 Producing a plot of bodyweight vs. brainweight

Here is the R code which I used to produce the picture.

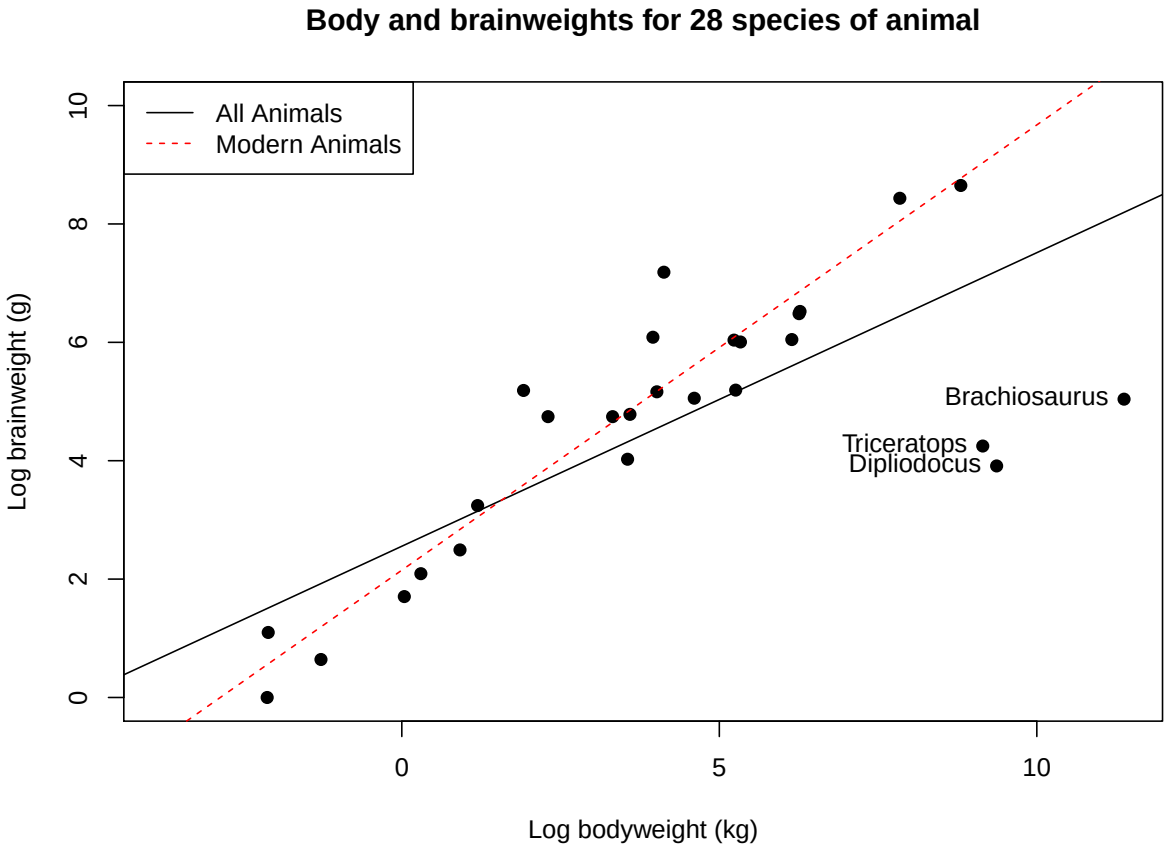
```
library(MASS)
Animals

pdf("BrainBodyRegression.pdf", width = 8, height = 6)
plot(log(brain) ~ log(body), data = Animals, ylim = c(0,10),
  ylab = "Log brainweight (g)",
  xlab = "Log bodyweight (kg)",
  main = "Body and brainweights for 28 species of animal",pch = 19)

abline(lm(log(brain) ~ log(body), data = Animals))

#identify(log(Animals$body), log(Animals$brain), labels = row.names(Animals))

Dino <- c(6,16,26)
text(log(Animals$body)[Dino], log(Animals$brain)[Dino],
     labels = row.names(Animals)[Dino], pos = 2)

ModernAnimals <- Animals[-Dino,]
abline(lm(log(brain) ~ log(body), data = ModernAnimals), col = "red", lty = 2)

legend("topleft", legend = c("All Animals", "Modern Animals"), lty = c(1,2),
  col = c("black", "red"))
dev.off()
```

Note: Initially I used the *commented-out* `identify` to identify the three outliers and had no `text` command. When I ran the `identify` version it told me these were the 6^{th}, 16^{th} and 26^{th} rows in the dataframe. I then used these as the labels in the `text` command in the final version. A slicker version is to use

```
Dino <- identify(log(body), log(brain), labels = row.names(Animals), plot = FALSE)
```

to identify the points without labelling them while saving their indices to automate construction of the final plot.

In case you didn't realise, the three outlying animals were dinosaurs and extinct a long time ago. All of the other animals are current. The fit of the data to our relationship is actually pretty good and people do think there is a relationship of the form described between bodyweight and brainweight.


Body and brainweights for 28 species of animal
All Animals
Modern Animals
Brachiosaurus
Triceratops
Dipliodocus
Log brainweight (g)
Log bodyweight (kg)
0
2
4
6
8
10
0
5
10