

## # Exercise 1b: Bootstrapping

# In this exercise we will explain bootstrapping in some more detail than the in Lecture 1.

# We will use the same data set as in Exercise 1, age of mineral samples.

# First generate one bootstrap sample by the command

```
bootsamp=sample(rock.age,replace=T)
```

# Compare this sampled data with the original data by writing

```
sort(bootsamp); sort(rock.age)
```

# Compute the mean and median of the bootstrap sample and compare with the corresponding #values in the original data.

# Draw another bootstrap sample and repeat the comparison.

# One will typically draw a large number of bootstrap samples, say 1000, calculate the #statistic for which we want to find a confidence interval and use the 2.5 and 97.5 percentiles #as the confidence limits. This can be done, for the mean, using the commands

```
bootagemean<-numeric(0)
```

```
for (i in 1:1000) bootagemean[i]<-mean(sample(rock.age,replace=T))
```

```
sort(bootagemean)[c(25,975)]
```

# Compare with the results using the t-interval. Also, inspect the ten first bootstrap estimates #of the mean by writing

```
bootagemean[1:10]
```

# Increase the number of bootstrap samples to 10000 and 50000. Comment.

# Make bootstrap confidence intervals for the median.