Practical 1

Jumping Rivers

Question 1

This question contains some maths equations, in particular two summations. If you're unsure about summations either ask your presenter or skip this question. We're not bothered about your maths theory skills, just your R skills!

```
total = 0
for (i in 1:5) {
    total = total + i
}
total
```

The `for` loop above calculates

$$\sum_{i=1}^{5} i = 1 + 2 + 3 + 4 + 5$$

1. What is the final value of `total` in the above piece of code?
2. Change the above loop to calculate the following summations:

$$\text{(i)} \sum_{i=1}^{20} (i + 1)$$

$$\text{(ii)} \sum_{j=-10}^{15} j$$

3. Rewrite the two loops using the `sum()` function. For example, the for loop in the first example can be written as `sum(1:5)`

Question 2

In the notes, we observed that it was straight forward to loop through a data set set and select the maximum values:

```
dd = data.frame(x = rnorm(10), y = rnorm(10),
    z = rnorm(10))

max_cols = numeric(ncol(dd))
for (i in seq_along(dd)) {
    max_cols[i] = max(dd[, i])
}
max_cols
```

- Alter the above the code to calculate the `mean()` instead of the maximum value
- Now, calculate the standard deviation (via `sd()`) as well as the mean. You should only have a single loop!

Solutions

Solutions are contained within this package:

```
vignette("solutions1", package = "jrProgramming")
```