Basic Course on R: Manipulating Data Practical

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1 Manipulating / Selecting Data

1.1 Answer the following without typing the commands into R. Use ? if you're not sure what the object is or what the function does.

1.1.1 What is

```
length(letters)
```

1.1.2 What is

```
length(letters == LETTERS)
```

1.1.3 What is

```
which(letters %in% c("a", "d"))
```

1.1.4 What is

```
which(c("a", 7, "d") %in% letters)
```

1.1.5 What is

```
letters[LETTERS > "W"]
```

1.1.6 What is

```
letters[!LETTERS > "C"]
```

1.1.7 What is

```
seq(from = 1, to = 20, by = 3)
```

1.1.8 Why is `x` filled in the way it is? Hint: read about the arguments for `matrix`!

```
x <- matrix(8:11, nrow = 6, ncol = 4)
x
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    8   10    8   10
## [2,]    9   11    9   11
## [3,]   10    8   10    8
## [4,]   11    9   11    9
## [5,]    8   10    8   10
## [6,]    9   11    9   11
```

1.1.9 What are

```
x + 4
x + x
2 * x
x / c(2, 3, 4, 5)
x[, 3] + 2 * x[, 2]
nrow(x)
x[x[, 3] > 10, ]
```

1.2 Use R to answer the following.

1.2.1 Create a vector (using `c()`) called `a` (i.e. assign it to an object called `a`) with four elements which are the integers 5 to 8 (inclusive).

1.2.2 Display element 2 of `a`.

1.2.3 Display element 4 of `a`.

1.2.4 Calculate the product of elements 2 and 4 of `a`.

1.2.5 Assign the integers 3 and 4 to object `b` and use `b` to select elements 3 and 4 of object `a`.

1.2.6 Display every element of `a` except element 2.

1.2.7 Display every element of `a` except elements 3 and 4.

1.2.8 Display only those elements of `a` that are greater than or equal to 6.

1.2.9 Display only those elements of `a` that are not equal to 7.

1.2.10 Use the `list` function to create an object `ab` which is a list of the two objects `a` and `b`.

1.2.11 Display `ab`.

1.2.12 Change the names of the elements in `ab` to "a" and "b".

1.2.13 Display `ab` again. What has changed?

1.2.14 Create this matrix `m`:

```
m <- matrix(1:9, nrow = 3, byrow = T)
m
```

```
##      [,1] [,2] [,3]
## [1,]    1    2    3
## [2,]    4    5    6
## [3,]    7    8    9
```

Why are the numbers 1, 2, and 3 in the first row and not the first column?

1.2.15 Display the element on the second row and second column of `m`.

1.2.16 Display only the 2nd row of `m`.

1.2.17 Display only the 3rd column of `m`.

1.2.18 Display only the 2nd and 3rd columns of `m`. Do so in two different ways.

If you want to save your work: save your R session and/or source code!