Week 1 Exercises

Jeroen Knoester

Exercise 1 - Variables

a) Write an expression to compute the sum of the numbers 3 and 4

```
sum(3, 4)
```

```
## [1] 7
```

b) Write an expression to determine if the product of 4 and 5 is equal to 21

```
prod(4, 5) == 21
```

```
## [1] FALSE
```

c) Create the variables x,y,z with values (respectively) 2, 3.5, 7

```
x <- 2
y <- 3.5
z <- 7
```

d) Exploit a function of R to investigate the datatypeof the three variables x,y,z

```
typeof(x)
```

```
## [1] "double"
```

```
typeof(y)
```

```
## [1] "double"
```

```
typeof(z)
```

```
## [1] "double"
```

e) Write an expression to compute the multiplication of the three variables x,y,z

```
prod(x,y,z)
```

```
## [1] 49
```

f) Write a Boolean expression (i.e., which result is T or F) which checks if the product of x,y,z is equal to 49

```
prod(x,y,z) == 49
```

```
## [1] TRUE
```

g) Create a variable s with value "Alexander"

```
s <- "Alexander"
```

h) Look for a function returning the length of a string and use it to determine the length of s

```
nchar(s)
```

```
## [1] 9
```

Exercise 2 - Vectors

a) Create a variable ?? (a vector) with the value 1: 10

```
x <- 1:10
```

b) How can you investigate the length of ???

```
length(x)
```

```
## [1] 10
```

c) Multiply x by the number 1.2

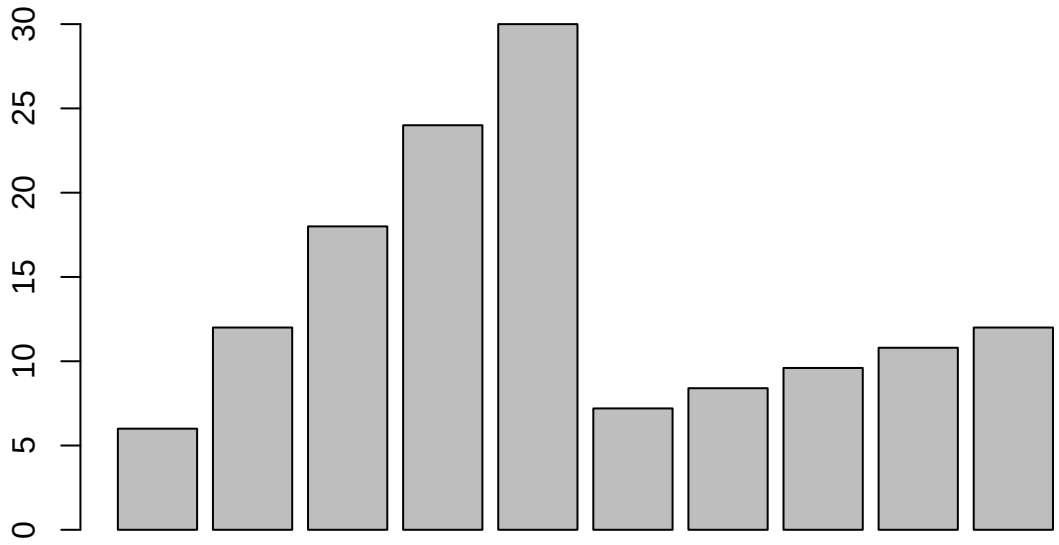
```
x <- x*1.2
```

d) Multiply the first five elements of x by 2

```
x[1:5] <- x[1:5] * 5
```

e) Visualize x using *barplot(x)*

```
barplot(x)
```

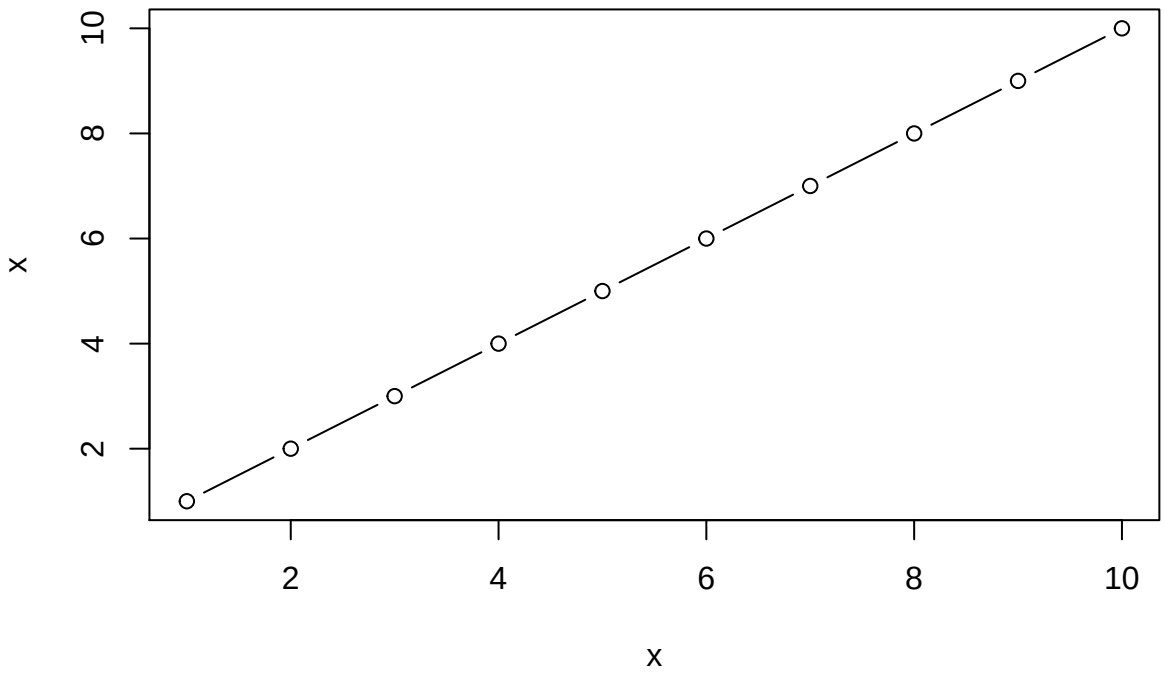


f) Assign to x the values of all integers from 0 to 10

```
x <- 1:10
```

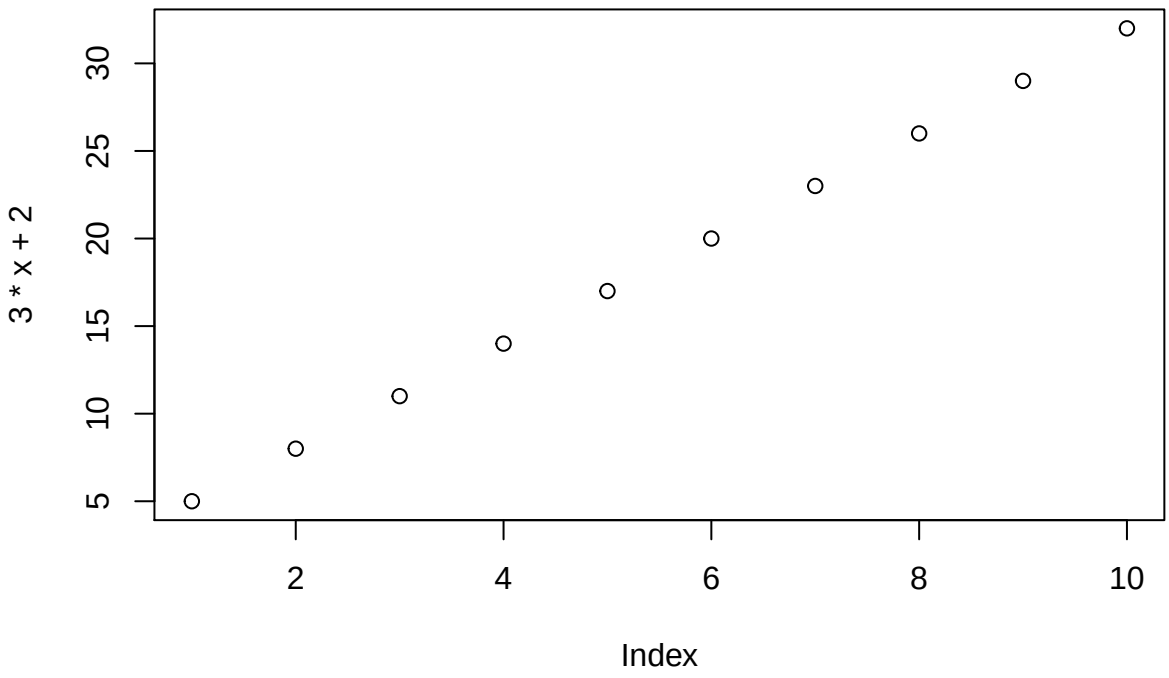
g) Create a graph of x against x using *plot(x,x,type = "b")*

```
plot(x,x,type= "b")
```



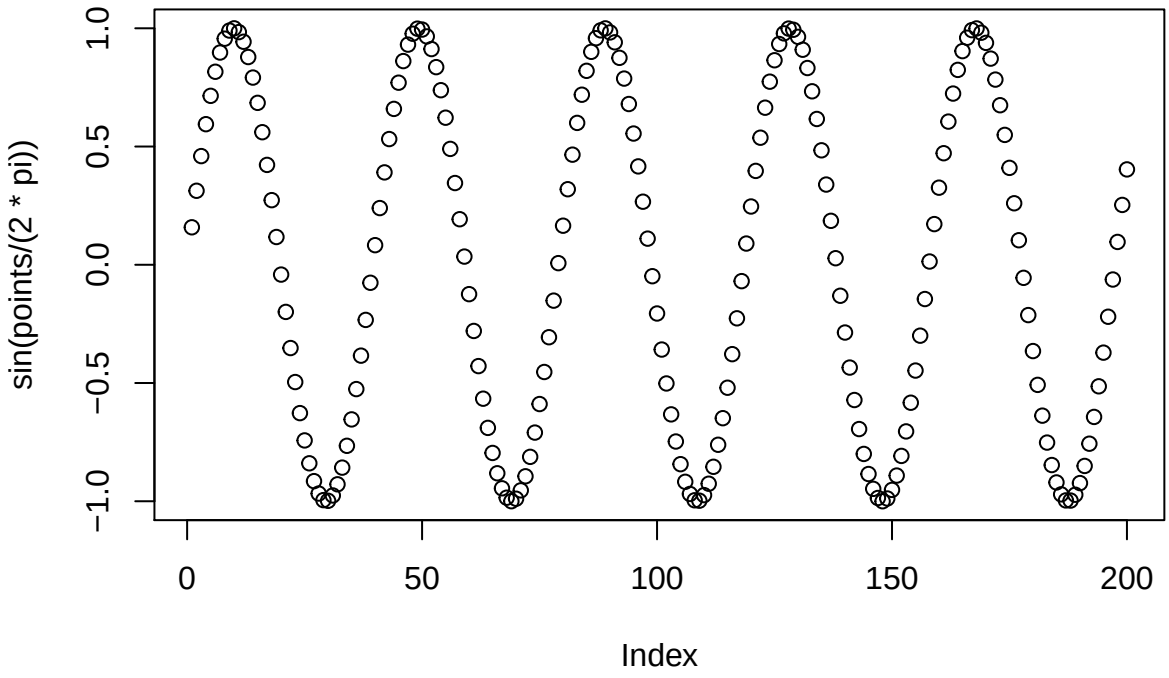
h) Use *plot* to draw the graph of the function $y = 3x + 2$ for values of x between 0 and 10

```
plot(3*x+2)
```



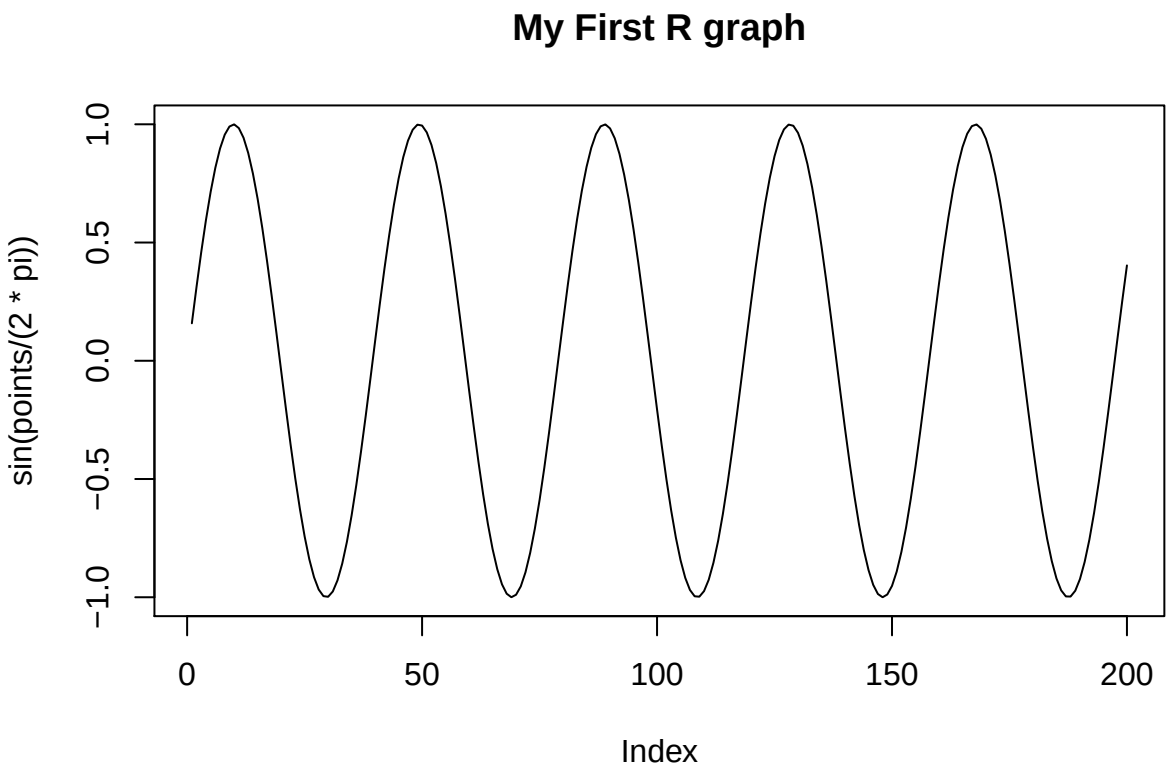
i) Use *plot* to draw the graph of the function $y = sin(x)$ for values of x between 0 and 2 pi (use at least 200 points)

```
points <- 1:200
plot(sin(points / (2 * pi)))
```



j) Find out how the graph can be made of only one line (without symbols) and give the graph a name (for example *"My First R graph"*)

```
plot(sin(points / (2 * pi)), type="l", main="My First R graph")
```



k) Find out how the function *"curve"* works and use it to plot the values of *cos(x)* between 0 and 2 * pi