Stat 360 Week 1 exercises

1. On which line does a get copied in the following example?

```
a <- c(1, 5, 3, 2)
b <- a
b[[1]] <- 10
```

Solution Line 3:

```
a <- c(1, 5, 3, 2)
tracemem(a)
```

```
## [1] "<0x7f9665fb41a8>"
```

```
b <- a
tracemem(b)
```

```
## [1] "<0x7f9665fb41a8>"
```

```
b[[1]] <- 10
```

```
## tracemem[0x7f9665fb41a8 -> 0x7f96689204d8]: eval eval withVisible withCallingHandlers handle timing_
```

2. In the following code chunk, does `x` get copied? Does `ll` get copied? Does `ee` get copied?

```
x <- rnorm(100); y <- rnorm(100)
ll <- list(x=x,y=y)
ll$x <- 1:100
ee <- rlang::env(x=x,y=y)
ee$x <- 1:100
```

Solutions Use `tracemem()` on `x`, `y` and `ll` to see that only `ll` gets copied. (Recall that you can't put a trace on the environment `ee`.)

3. Find the size of the objects x and y in the following code chunk. Which is smaller? If instead of vectors from 1 to 10 they were vectors from 1 to 1 million, which would be smaller?

```
x <- c(1,2,3,4,5,6,7,8,9,10)
y <- 1:10
```

Solution Use `lobstr::obj_size()` to see that `x` is actually smaller! However, for vectors of length 1 million `y` would be smaller. You can see this if, for example, you generate 1 million random numbers:

```
lobstr::obj_size(x)
```

```
## 176 B
```

```
lobstr::obj_size(y)
```

```
## 680 B
```

```
x <- rbinom(1e6,10,.5)
y <- 1:1e6
lobstr::obj_size(x)
```

```
## 4,000,048 B
```

```
lobstr::obj_size(y)
```

```
## 680 B
```