



## Introductory R Exercises

1. **Arithmetic Operations.** Please enter the following commands in R then write down the output that R produces. Explain to yourself what R thinks it is doing.

a) `2.0 + 3.1`

b) `2.0 * 3.1`

c) `3.0 ^ 2.0`

d) `9.0 ^ 0.5`

e) `sqrt(9.0)`

f) `exp(1)`

g) `sin(pi)`

h) `cos(pi/2)`

i) `tan(pi/2)`

2. **Vector Operations.** Repeat Exercise 1 for the following.

a) `x <- c(1, 0, -2)`

b) `x`

c) `y <- c(-1, 4.5, 3)`

d) `x + y`

e) `x + 2`

f) `x*y`

g) `x ^ y`

h) `exp(x)`

i) `1:10`

j) `seq(1, 21, by=5)`

3. **Statistics.** Repeat Exercise 1 for the following.

a) `x <- seq(-5, 5)`

b) `mean(x)`

c) `sd(x)`

d) `range(x)`

e) `length(x)`

f) Repeat a)– e) using `y <- seq(-1, 1, by=0.2)`. Compare your results.

4. **Experiments**

a) Enter `sample(10, 4)` several times. What is R doing?

b) Repeat a) using different values in place of 10 and 4. What happens if you enter `sample(10, 11)`?

c) Enter `sample(c("H", "T"), 5, replace=TRUE)`. What is R doing?

d) Use R to simulate flipping a coin 100 times. 1000 times.

5. **Graphics**

a) Enter the following and sketch the result.

```
x <- seq(-4,4,by=0.1)
```

```
plot(x, dnorm(x), type="l", cex.lab=1.5, cex.axis=1.5, xlim=c(-4,4), ylim=c(0,0.5))
```

b) Explain what the `xlim` and `ylim` parts of the command above mean.

c) Experiment to try to figure out what the `cex.lab` and `cex.axis` parts of the command do.