Ch 1 Practice: Example homework

Solutions

Each question asks you to write some code, some will also ask you to answer a question or write some math. Write your answer in a full complete sentence with reasonably acceptable grammar. Knit this file to PDF after each question.

1. Let x <- c(1,2,3) and y <- c(6,5,4). Explain the math that is happening to the numbers when you run each of the following statements.

```
x <- c(1,2,3)
y <- c(6,5,4)
```

a) x^2

```
x*2
```

```
## [1] 2 4 6
```

Delete this line and put your answer here. Notice there is a blank line both before this answer and after. Each element of x is squared.

b) xy

```
x*y
```

```
## [1]  6 10 12
```

Each element of x is multiplied by the element of y in the same position. Element-wise multiplication.

c) x_1y_2

```
x[1]*y[2]
```

```
## [1] 5
```

The first element of x is multiplied by the second element of y.

2. What is the sum of the squares of all numbers from 1 to 100 (e.g. $1^2 + 2^2 + \cdots + 100^2$)?

```r
x <- 1:100
sum(x^2)
```

```
## [1] 338350
```

3. What is the sum of the first 100 positive integers? The formula for the sum of integers 1 through n is $\frac{n(n+1)}{2}$.
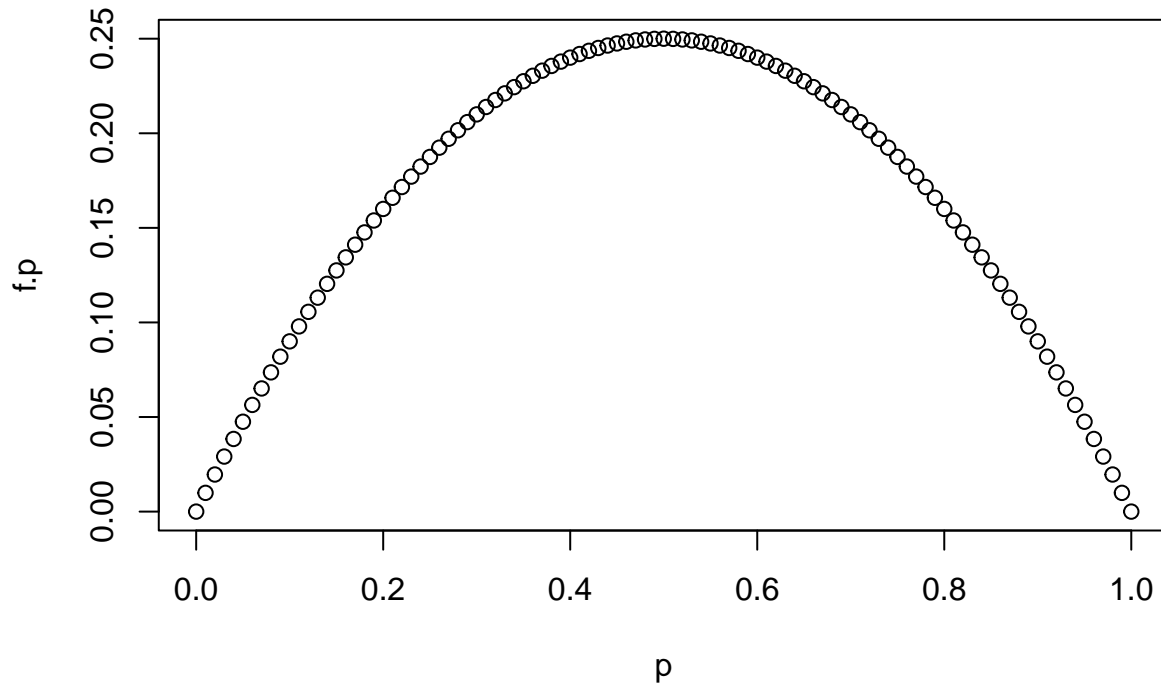
Hint: Define $n = 100$ and then use R to compute the sum of 1 through 100 using the formula.

```r
n <- 100
n*(n+1)/2
```

```
## [1] 5050
```

4. Graph the function $f(p) = p(1-p)$ where p is a continuous number between 0 and 1.

```r
p <- seq(0,1,by=.01)
f.p <- p*(1-p)
plot(p, f.p)
```

5. Switch to the visual editor for the next few questions.

a. Insert a picture that you find inspiring

b. Write an equation using both display math, and inline math. You can google

c. Insert a code chunk and do some math.