Homework 1

1. Compute
$$1^2 + 2^2 + 3^2 + \cdots + 99^2 + 100^2.$$

2. How many digits does $N = 1234567891011121314...9998999910000$ have, where N is formed by concatenating $1, 2, 3, \ldots, 9999, 10000$? (*Hint*: you might want to look up the functions `nchar()`, `as.character()`, `paste()`)

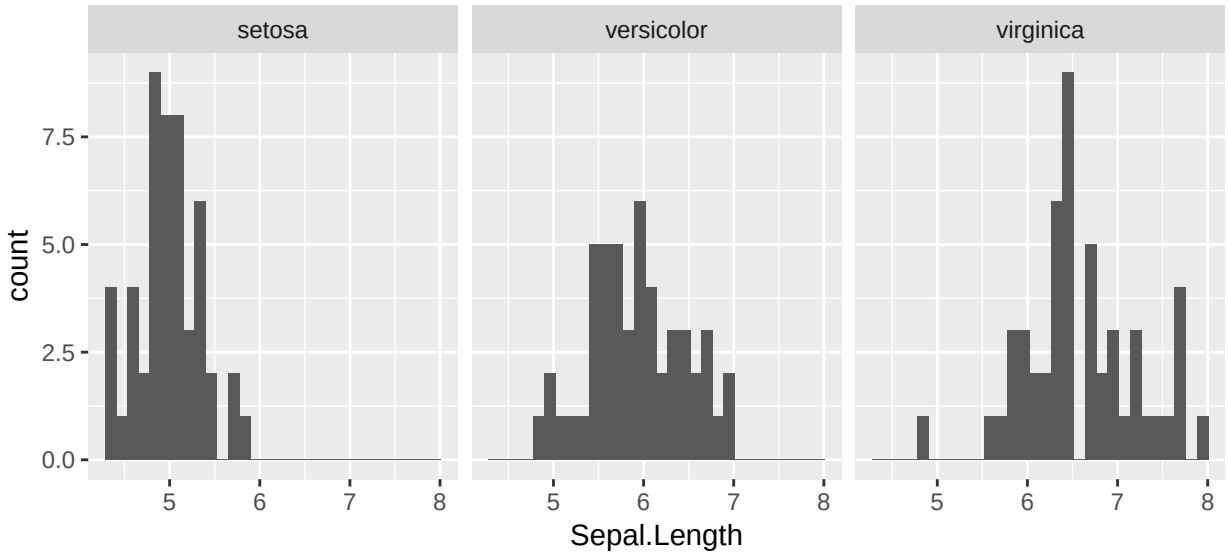
`iris` is a data set that comes with base R. It consists of 150 observations with 5 columns, Sepal.Length, Sepal.Width, Petal.Length, Petal.Width, Species, which are features related to Iris flowers. You can view the first few rows using `head()`:

```
head(iris)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

3. Compute the sample mean of `Sepal.Length`. Also, what is the *fifth* smallest value of `Sepal.Length`?

4. Obtain the following plots that describe the histogram of `Sepal.Length` by `Species`.



5. Recall that the data set `heights.txt` consists of 1375 observations of mother/daughter height pairs. As done in class, you can read in the data set using the following code:

```
d <- read.table(file = "heights.txt", header = T, sep = " ")
```

In how many pairs is mother's height greater than daughter's height?