

Homework 1

1. Compute

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

2. How many digits does $N = 1234567891011121314\ldots9998999910000$ 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 dataset 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 with 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, sample variance, and 90% quantile of `Sepal.Length`.
4. What is the *fifth* smallest value of `Sepal.Length`?
5. Obtain the following plots that describe the histogram of `Sepal.Length` by `Species`.

