

Homework 1

1. Compute

$$2^2 + 4^2 + 6^2 + \cdots + 998^2 + 1000^2,$$

the sum of squares of all even numbers from 2 to 1000.

2. How many digits does $N = 1234567891011121314\dots9998999910000$ have, where N is formed by concatenating $1, 2, 3, \dots, 9999, 10000$? (*Hint*: you might want to look up the functions `nchar()`, `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`.

