Assignment 1 Question 2

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e. Using R, add a new variable to the data called PetalRatio = PetalWidth/PetalLength and then determine

```
iris_data <- read.csv("Iris.csv")
iris_data <- transform(iris_data, PetalRatio = PetalWidth / PetalLength)
```

i. the iris species with the largest and the smallest values of PetalRatio.

```
min_ratio_index <- which.min(iris_data$PetalRatio)
min_ratio.species <- iris_data[min_ratio_index, "Species"]

max_ratio <- max(iris_data$PetalRatio)
max_ratio.species <- iris_data[iris_data$PetalRatio == max_ratio, "Species"]

message("The species with the smallest PetalRatio is ", min_ratio.species)
```

```
## The species with the smallest PetalRatio is Iris-setosa
```

```
message("The species with the largest PetalRatio is ", max_ratio.species)
```

```
## The species with the largest PetalRatio is Iris-virginica
```

ii. within each iris species, the proportion of samples with PetalRatio > 0.3.

```
setosa_subset <- sum(iris_data$Species == "Iris-setosa" & iris_data$PetalRatio > 0.3)
total_setosa <- sum(iris_data$Species == "Iris-setosa")
setosa_ratio <- setosa_subset/total_setosa
message("Iris-setosa: The proportion of samples with PetalRatio > 0.3 is ", setosa_ratio)
```

```
## Iris-setosa: The proportion of samples with PetalRatio > 0.3 is 0.04
```

```
versicolor_subset <- sum(iris_data$Species == "Iris-versicolor" & iris_data$PetalRatio > 0.3)
total_versicolor <- sum(iris_data$Species == "Iris-versicolor")
versicolor_ratio <- versicolor_subset/total_versicolor
message("Iris-versicolor: The proportion of samples with PetalRatio > 0.3 is ", versicolor_ratio)
```

```
## Iris-versicolor: The proportion of samples with PetalRatio > 0.3 is 0.66
```

```
virginica_subset <- sum(iris_data$Species == "Iris-virginica" & iris_data$PetalRatio > 0.3)
total_virginica <- sum(iris_data$Species == "Iris-virginica")
virginica_ratio <- virginica_subset/total_virginica
message("Iris-virginica: The proportion of samples with PetalRatio > 0.3 is ", virginica_ratio)
```

```
## Iris-virginica: The proportion of samples with PetalRatio > 0.3 is 0.86
```