

Statistical Method HW1

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```
data("iris")
dat = iris
head(dat)
```

```
##   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
```

1. What are the types of variables?

Sepal.Length : cardinal

Sepal.Width : cardinal

Petal.Length : cardinal

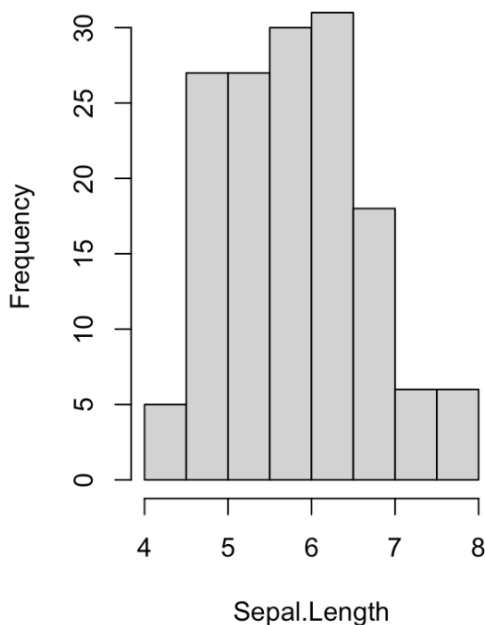
Petal.Width : cardinal

Species : nominal

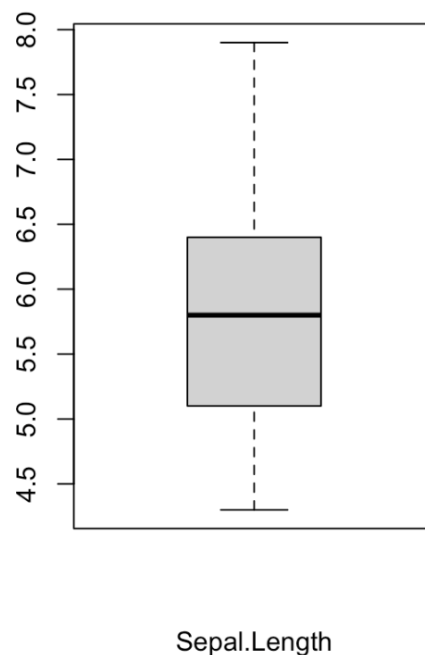
2. For each variables, give the histogram/barplot and boxplot.

Sepal.Length

Histogram

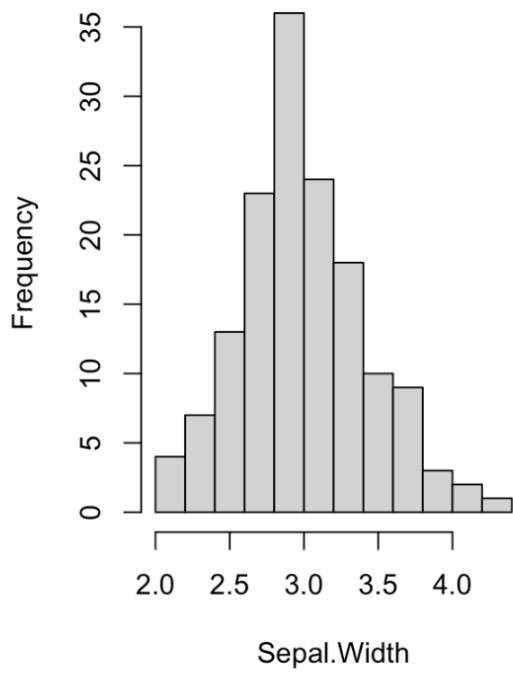


Boxplot

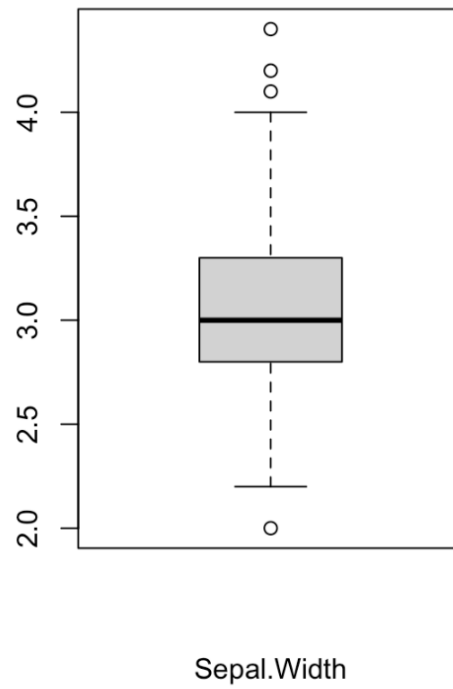


Sepal.Width

Histogram

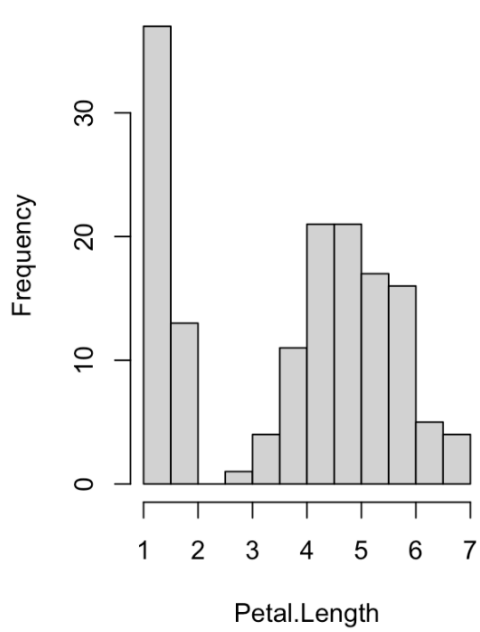


Boxplot

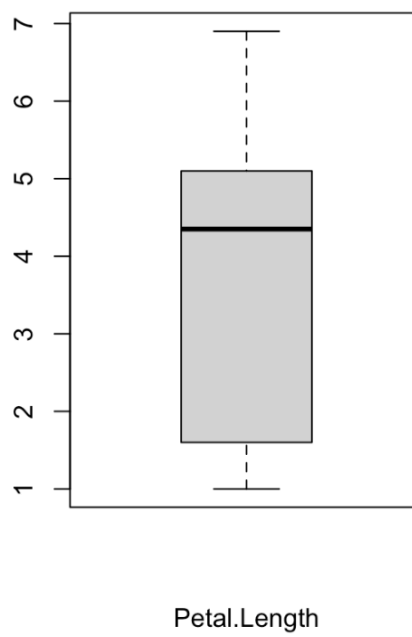


Petal.Length

Histogram

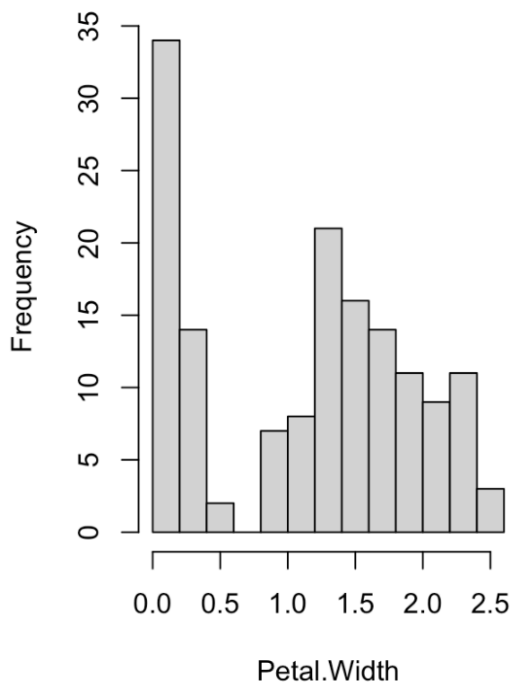


Boxplot

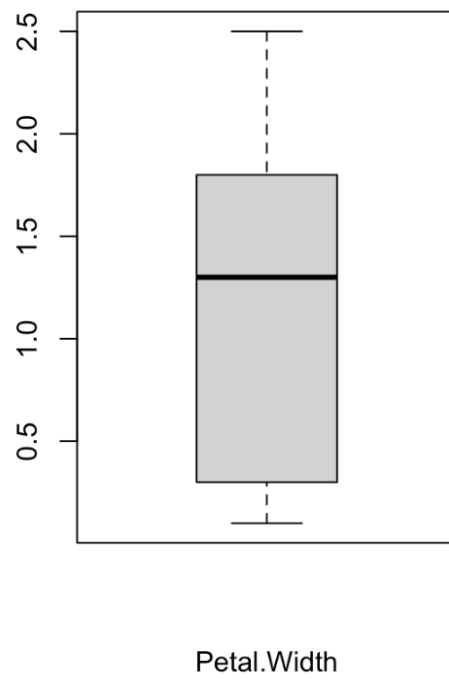


Petal.Width

Histogram

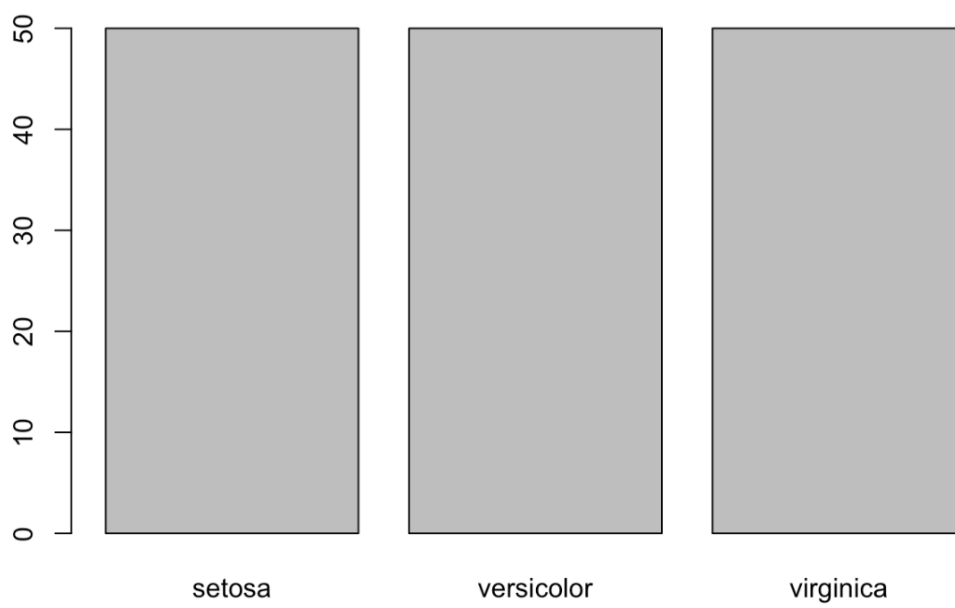


Boxplot



Species

Bar Chart



3. Use a table to summarize variables with the descriptive statistics including mean, median, variance, standard deviation, range, IQR, skewness, and kurtosis.

Table with IRIS data

Variables	Mean	Median	Variance	SD	Range	IQR	Skewness	Kurtosis
Sepal.Length	5.843333	5.80	0.6856935	0.8280661	3.6	1.3	0.3117531	2.426432
Sepal.Width	3.057333	3.00	0.1899794	0.4358663	2.4	0.5	0.3157671	3.180976
Petal.Length	3.758000	4.35	3.1162779	1.7652982	5.9	3.5	-0.2721277	1.604464
Petal.Width	1.199333	1.30	0.5810063	0.7622377	2.4	1.5	-0.1019342	1.663933

4. Are all cardinal variables symmetric?

According to the histogram & boxplot above, we can easily see that `Petal.Length` & `Petal.Width` are NOT symmetric.

However, the histogram of `Sepal.Length` & `Sepal.Width` seem to look like Normal distribution, but when we take a look at its boxplot very carefully, we can see that `Sepal.Length` & `Sepal.Width` are NOT symmetric either.

5. Is there any outlier?

According to the boxplot above, we can see that there are NO outliers in the variables `Sepal.Length`, `Petal.Length`, `Petal.Width`.

However, there are 4 outliers in the variable `Sepal.Width`.