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Project 1

1.7 Consider the drying time data for Exercise 1.1 on page 13. Compute the sample variance and sample standard deviation.

```
> y = c(3.4, 2.5, 4.8, 2.9, 3.6, 2.8, 3.3, 5.6, 3.7, 2.8, 4.4, 4.0, 5.2, 3.0,
4.8)
>
> sd(y)
[1] 0.9709102
> var(y)
[1] 0.9426667
```

1.13 A manufacturer of electronic components is interested in determining the lifetime of a certain type of battery. A sample, in hours of life, is as follows:

123, 116, 122, 110, 175, 126, 125, 111, 118, 117.

(a) Find the sample mean and median.

Mean:

```
> x <- c(123, 116, 122, 110, 175, 126, 125, 111, 118, 117)
>
> result.mean <- mean(x)
> print(result.mean)
[1] 124.3
```

Median:

```
> x <- c(123, 116, 122, 110, 175, 126, 125, 111, 118, 117)
>
> result.median <- median(x)
> print(result.median)
[1] 120
```

(b) What feature in this data set is responsible for the substantial difference between the two?

The 175 in the dataset deviates significantly from the mean and median, which is what drives up the value of the mean. If we applied a trim of 1, we would get a value that's much closer to the median:

```
> x <- c(123, 116, 122, 110, 175, 126, 125, 111, 118, 117)
>
> result.mean <- mean(x, trim = 0.1)
> print(result.mean)
[1] 119.75
```

1.22 The following data are the measures of the diameters of 36 rivet heads in 1/100 of an inch.

6.72 6.77 6.82 6.70 6.78 6.70 6.62 6.75

6.66 6.66 6.64 6.76 6.73 6.80 6.72 6.76

6.76 6.68 6.66 6.62 6.72 6.76 6.70 6.78

6.76 6.67 6.70 6.72 6.74 6.81 6.79 6.78

6.66 6.76 6.76 6.72

(a) Compute the sample mean and sample standard deviation.

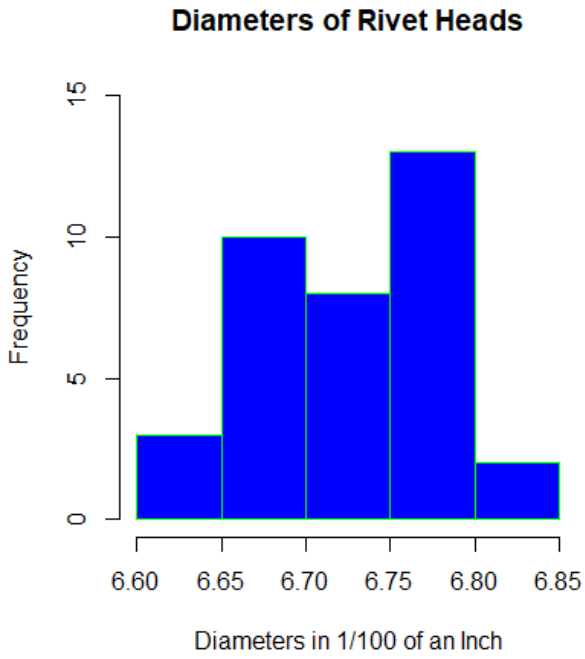
Mean:

```
> x <- c(6.72, 6.77, 6.82, 6.70, 6.78, 6.70, 6.62, 6.75,
+        6.66, 6.66, 6.64, 6.76, 6.73, 6.80, 6.72, 6.76,
+        6.76, 6.68, 6.66, 6.62, 6.72, 6.76, 6.70, 6.78,
+        6.76, 6.67, 6.70, 6.72, 6.74, 6.81, 6.79, 6.78,
+        6.66, 6.76, 6.76, 6.72)
>
> result.mean <- mean(x)
> print(result.mean)
[1] 6.726111
```

SD:

```
> result.sd <- sd(x)
> print(result.sd)
[1] 0.05357386
```

(b) Construct a relative frequency histogram of the data.



(c) Comment on whether or not there is any clear indication that the sample came from a population that has a bell-shaped distribution.

The histogram appears to have a bi-modal distribution.