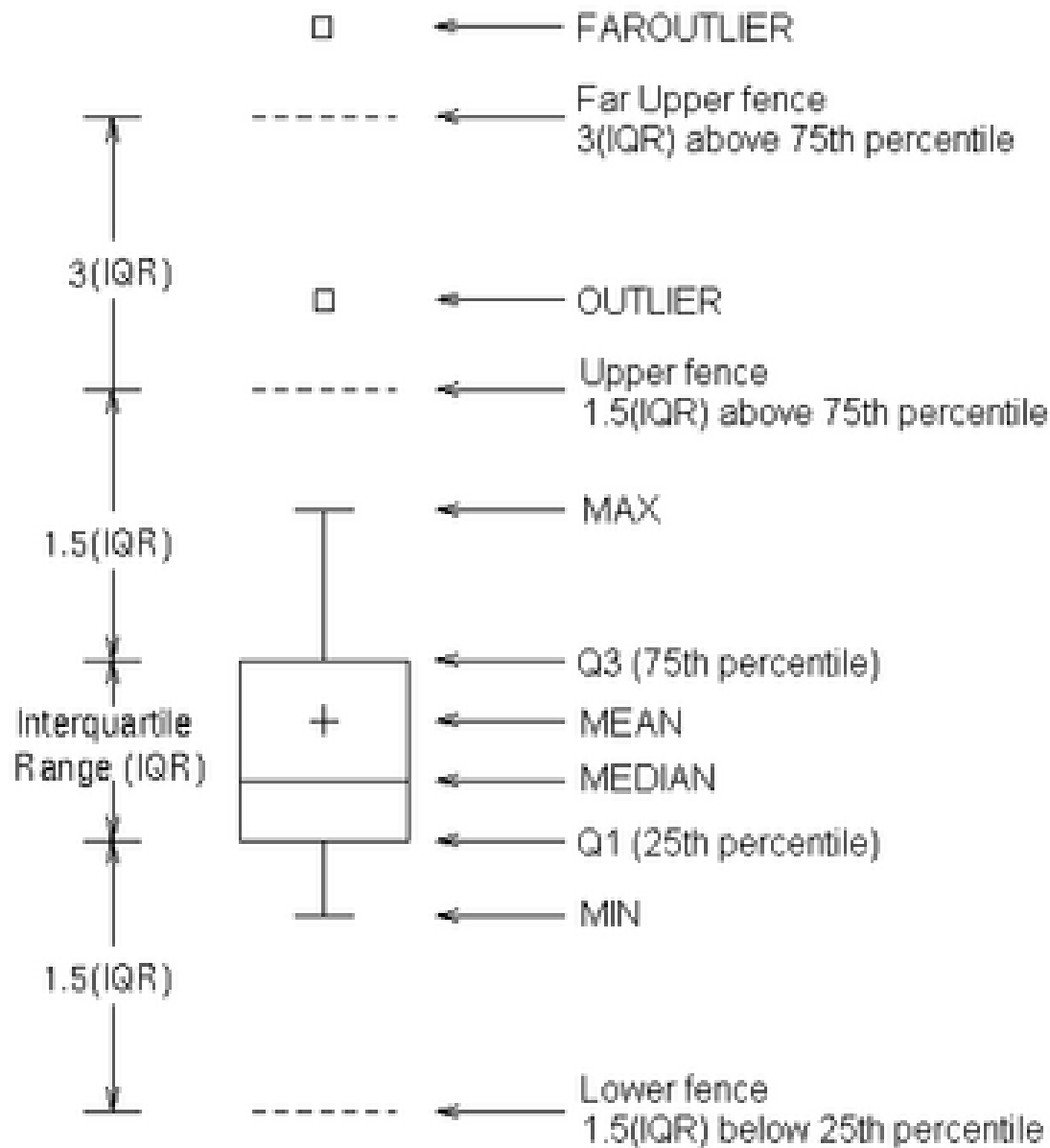


Stats 2MB3, Tutorial 2

Jan 23rd, 2015



Ex. 51, page 44

- 87,103,130,160,180,195,132,145,211,105,145,153,152,138,87,99,93,119,129 (min)
- a) Calculate the sample variance and standard deviation.
- b) If the observation were re-expressed in hours, what would be the resulting values of the sample variance and sample standard deviation? Answer without actually performing the re-expression.

- a)

Sample variance is 1264.77, sample standard deviation is 35.564.

b)

Proposition:

If $y_1 = cx_1, \dots, y_n = cx_n$, then $s_y^2 = c^2 s_x^2, s_y = |c| s_x$.

Proof:

since $\bar{y} = c\bar{x}$, then

$$s_y^2 = \frac{\sum (y_i - \bar{y})^2}{n-1} = \frac{\sum (cx_i - c\bar{x})^2}{n-1} = \frac{c^2 \sum (x_i - \bar{x})^2}{n-1} = c^2 s_x^2$$

- If y = measure the time by hours,
 x = by minutes,
then $y = x/60$, and $c = 1/60$.

By the proposition,

$$s_y^2 = c^2 s_x^2$$

the new sample variance is equal to
 $1264.77/3600 = 0.351$

and the new sample standard deviation is equal
to $35.564/60 = 0.593$

Ex 56, page 44

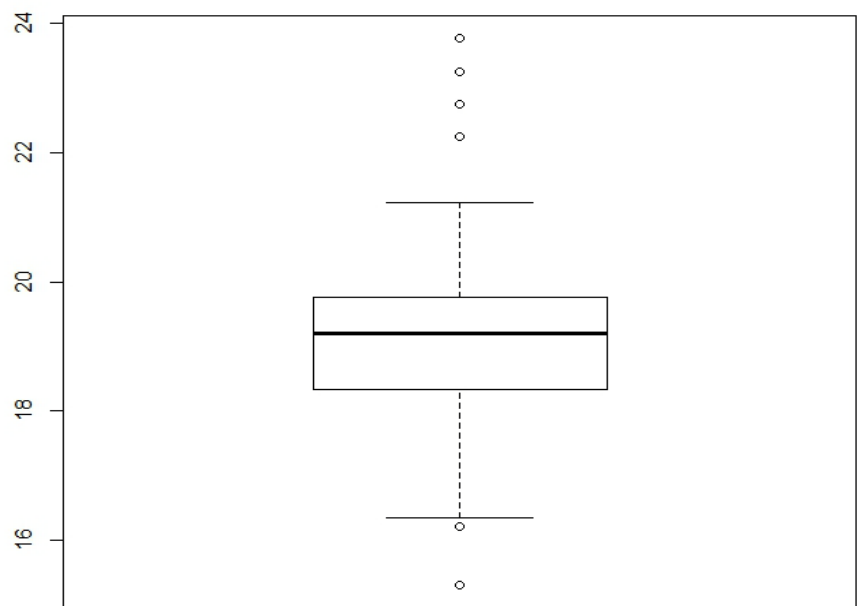
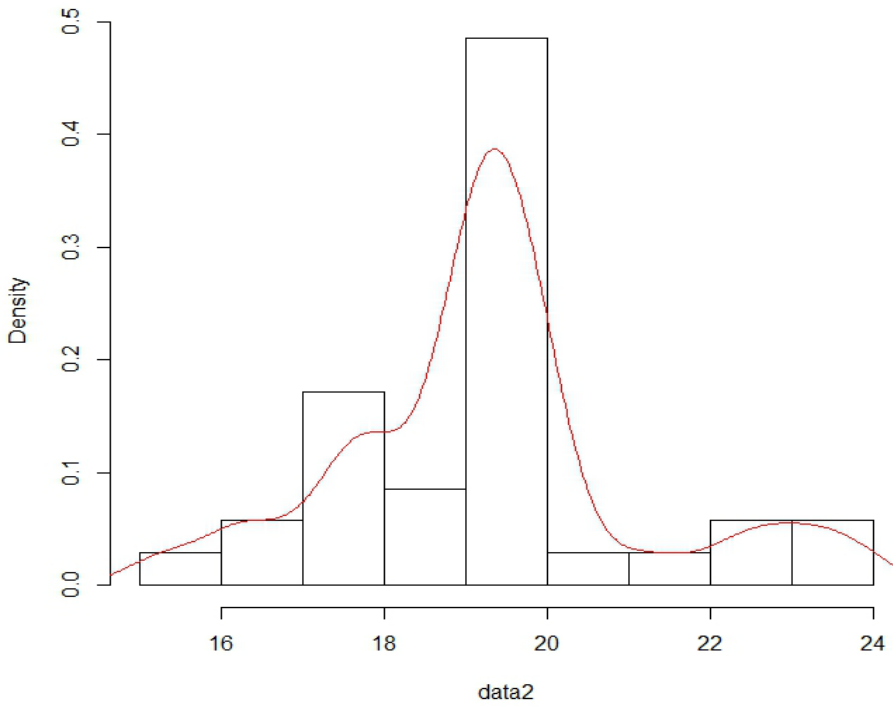
- 16.35,18.85,16.20,17.75,19.58,17.73,22.75,23.78,23.25,19.08,19.62,19.20,20.05,17.85,19.17,19.48,20.00,19.97,17.48,17.15,19.07,19.90,18.68,18.82,19.03,19.45,19.37,19.20,18.00,19.60,19.33,21.22,19.50,15.30,22.25
- Use methods from this chapter, including a boxplot that shows outliers, to describe and summarize the data.

```

15 | 3
16 | 24
17 | 25789
18 | 0789
19 | 011222345556669
20 | 001
21 | 2
22 | 38
23 | 38

```

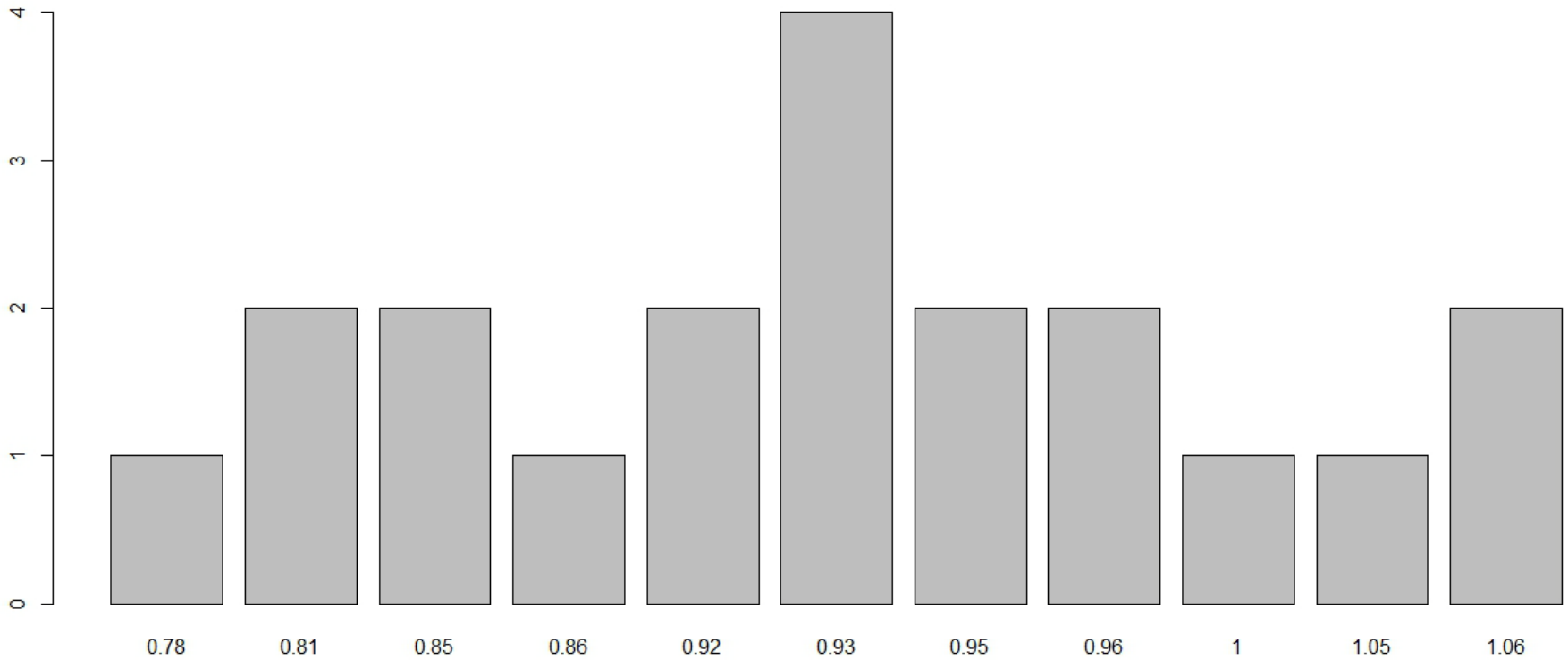
Histogram of data2



Ex 74, page 47

- The mode of a numerical data set is the value that occurs most frequently in the set.
- a) Determine the mode for the data
.95,.85,.92,.95,.93,.86,1.00,.92,.85,.81,.78,.93,.93,1.05,.93,1.06,1.06,.96,.81,.96 ;
- b) For a categorical sample, how would you define the modal category?

- a)



- The mode is 0.93.

- b)

Here is an example for categorical data:

Yates Cup Recipients in the recent 15 years

- 2000 - McMaster Marauders
- 2001 - McMaster Marauders
- 2002 - McMaster Marauders
- 2003 - McMaster Marauders
- 2004 - Wilfrid Laurier Golden Hawks
- 2005 - Wilfrid Laurier Golden Hawks
- 2006 - Ottawa Gee-Gees
- 2007 - Western Ontario Mustangs
- 2008 - Western Ontario Mustangs
- 2009 - Queen's Golden Gaels
- 2010 - Western Ontario Mustangs
- 2011 - McMaster Marauders
- 2012 - McMaster Marauders
- 2013 - Western Ontario Mustangs
- 2014 - McMaster Marauders

