STAT 13, section 1, Winter 2011, UCLA Statistics
HW 1; Problem Solution

• HW 1.1

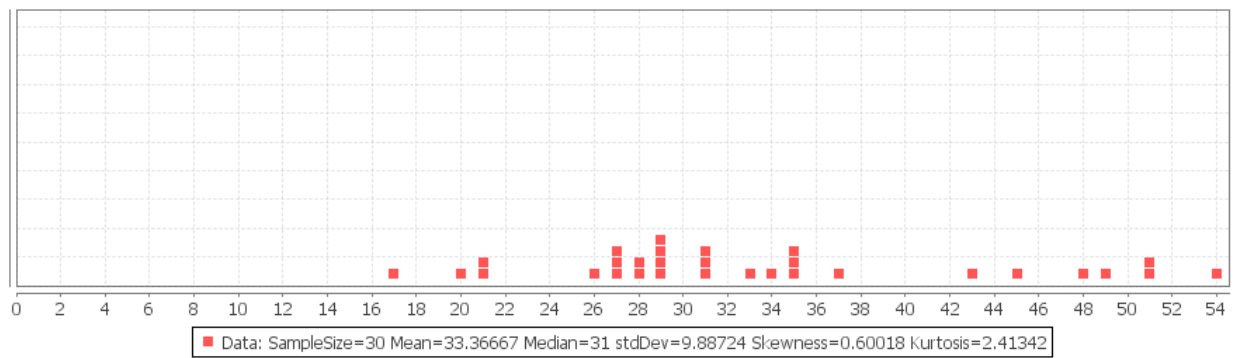(a) The stem-and-leaf diagram of dendritic segments can be constructed as:

```
1 | 7
2 | 001167778889999
3 | 011133455577
4 | 13589
5 | 114
```
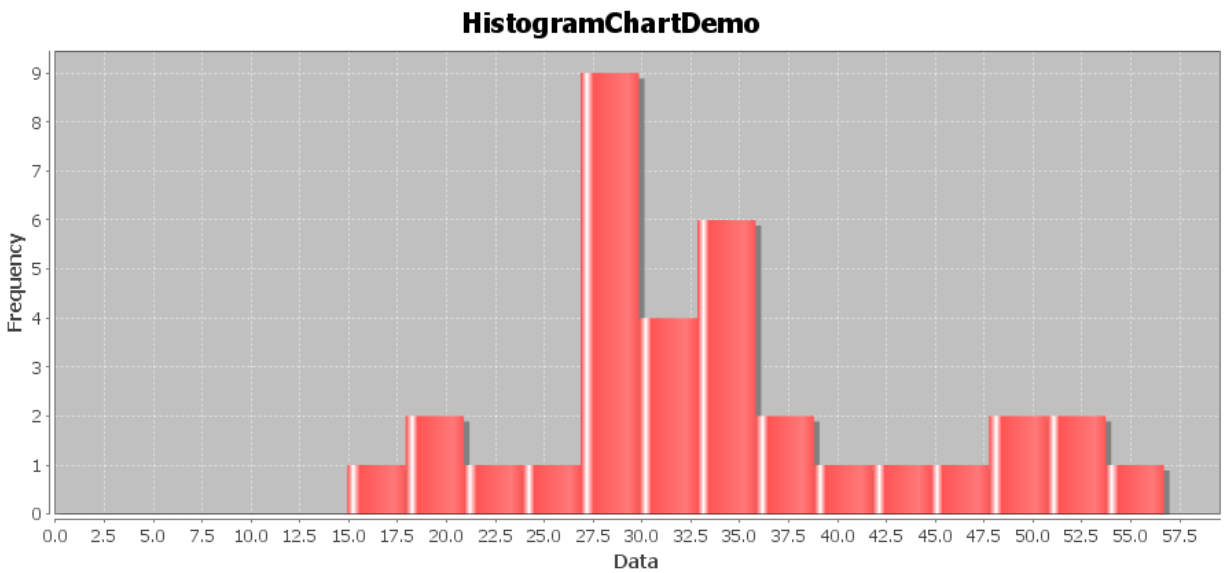
(b)

• HW 1.2

(Frequency Table)

# of segments	frequency
17	1
20	2
21	2
26	1
27	3
28	3
29	4

30	1
31	3
33	2
34	1
35	3
37	2
41	1
43	1
45	1
48	1
49	1
51	2
54	1

* You can do it with ranges instead of single values.

HistogramChartDemo

• HW 1.3

Boxplot b goes with the histogram. First we can observe that each bin has length 2, and therefore the values in the data set should range from 12 or 13 to 35 or 36. In order to distinguish plots b and d, we look at the median of the histogram. Since the distribution has a median around 25, we would match the histogram with boxplot b instead of boxplot d whose median is near Q3(near 27).

• HW 1.4

(a) The mean amount of dopamine in the sample is 6.44 nmol/g and standard deviation 0.83 nmol/g. The sample mean is the unweighted simple average of dopamine levels from all seven rat brains, and it can be used as an indicator for the "center" (or typical value) of the dopamine levels if the distribution is not skewed. The sample standard deviation measures the amount of variation of each dopamine level in the sample from the sample mean and can be used as an indicator for the "spread".

(b) The median is 6.2nmol/g. The IQR is 0.95nmol/g.

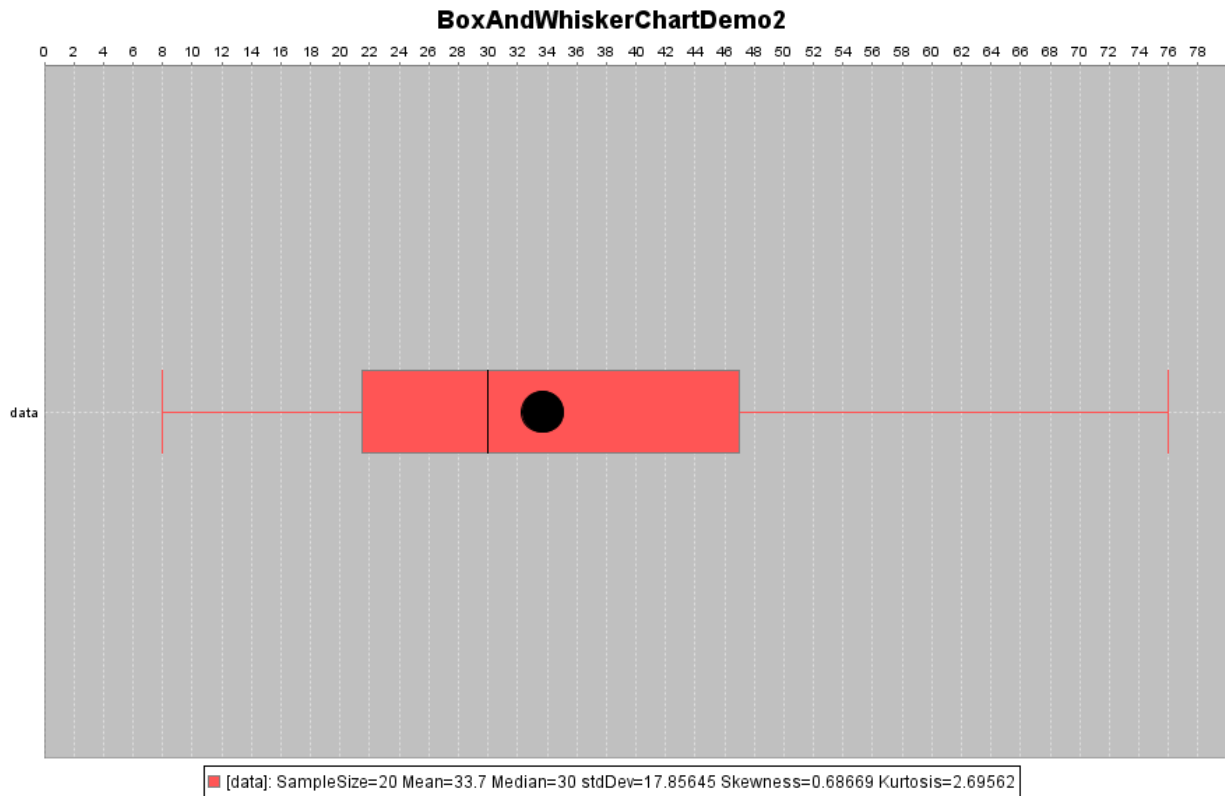(c) The coefficient of variation s 12.89%.

(d) The new sample mean, standard deviation, median and IQR are 6.87nmol/g, 1.71nmol/g, 6.2nmol/g and 1.15nmol/g, respectively. In this case where the second largest value is replaced by a new global maximum in a small sample, the only descriptive sample statistics that shows resistance to such change is the median.

• HW 1.5

(a) The first quartile, second quartile (median) and the third quartile are 21.75, 30, and 46.5, respectively.

(b) The IQR is 24.75.

(c)

BoxAndWhiskerChartDemo2

[data]: SampleSize=20 Mean=33.7 Median=30 stdDev=17.85645 Skewness=0.68669 Kurtosis=2.69562
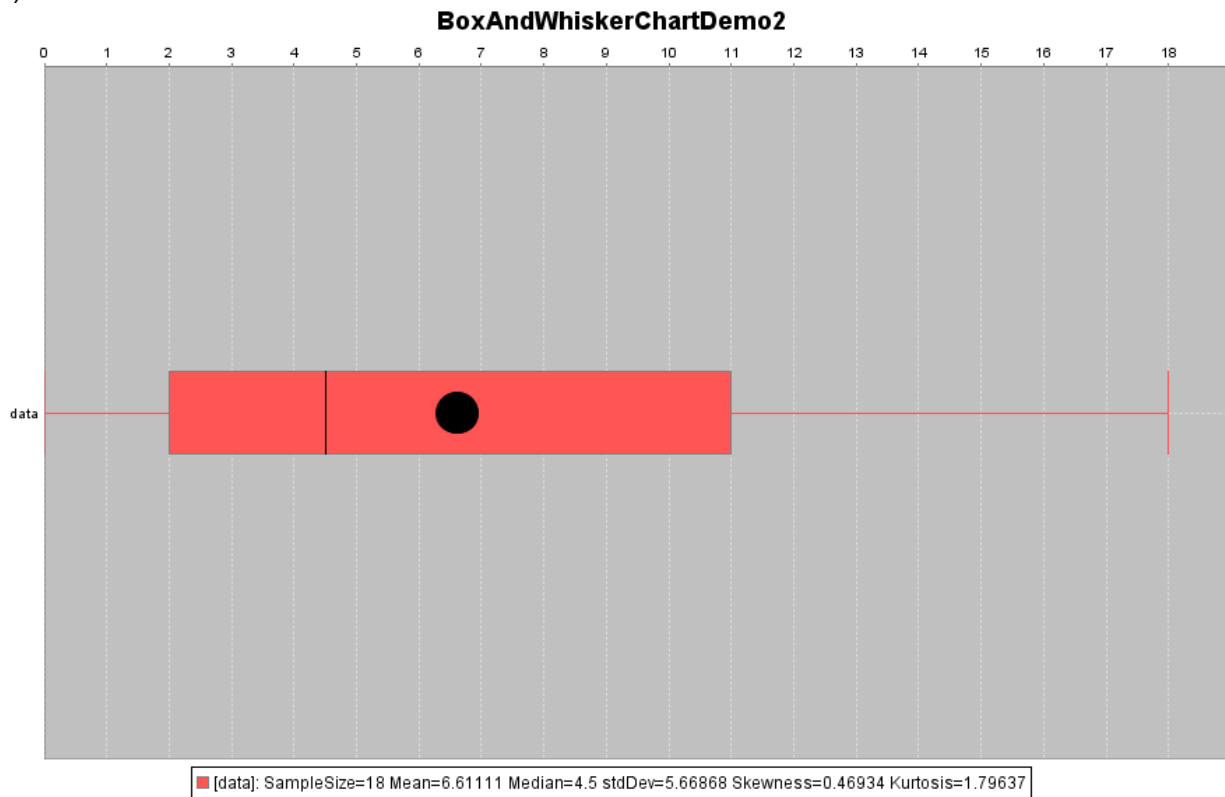
• HW 1.6

(a) Since there are a total of 119 flies, the median number of bristles is the 60th value in the sorted list. Accumulating from the top/smallest bristle, we can find that the median is 38.

(b) Likewise, the Q1 and Q3 are the 30th and 90th value in the sorted list and carry the values 36 and 41, respectively.

(c)

BoxAndWhiskerChartDemo2

[data]: SampleSize=18 Mean=6.61111 Median=4.5 stdDev=5.66868 Skewness=0.46934 Kurtosis=1.79637

(d) Within one SD of the mean, i.e. the range [35.25, 41.65], we observe 79 samples, or 66.4% of all observations.