Stat 104 – Homework 2
Solution

Assignment:

1. Complete the following problems from the text: 2.12, 2.23, 2.44, 2.56, 2.70, 2.82, 2.94, 2.110 and 2.122.

   If you have questions about these problems, please contact me.

2. Problem 2.44 has data on the hemoglobin A_{1C} blood test given to 40 different diabetic patients. A_{1C} values are percentages and are directly proportional to the concentration of glucose in the blood over the full life span of the red blood cells and are not subject to the fluctuations that are seen with daily blood glucose monitoring. An A_{1C} value of 7% is considered the target value for diabetes that is in control.

   Enter the data from problem 2.44 into a single column, labeled A1C, in a JMP data table. Use Analyze – Distribution to produce graphical and numerical summaries. These summaries should include: a properly oriented and labeled histogram, an outlier box plot, stem-and-leaf display, five number summary values, sample mean and sample standard deviation. Turn in your JMP output with this homework and use it to answer the following questions. **See last page for JMP output.**

   a) Describe the shape of the histogram produced by JMP.

      The shape of the histogram is skewed toward larger values (to the right). The mound is between 6 and 7 and the distribution slopes down gently toward the larger values.

   b) How does the histogram produced by JMP differ from the one you constructed in part c of 2.44? Be sure to comment on differences in the shape.

      JMP uses classes from 3 – 4, 4 – 5, etc. while problem 2.44 asked to use classes 3.7 – 4.7, 4.7 – 5.7, etc. As mentioned above the histogram produced by JMP is skewed toward larger values while the histogram in 2.44 is bi-modal.

   c) Report the values for a five number summary. Be sure to include appropriate units.

      Minimum = 4.0 %
      Q_1 = 5.925 %
      Median (Q_2) = 6.5 %
      Q_3 = 7.9 %
      Maximum = 9.2 %

   d) Report the values of the sample mean and sample standard deviation. Again, include appropriate units.

      Sample mean = 6.765%
      Sample standard deviation = 1.25075%

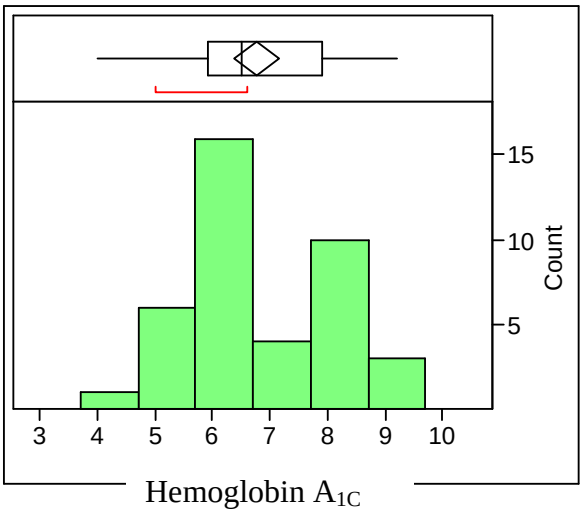
e) Does JMP use a split stem when producing the stem-and-leaf display?

Yes.

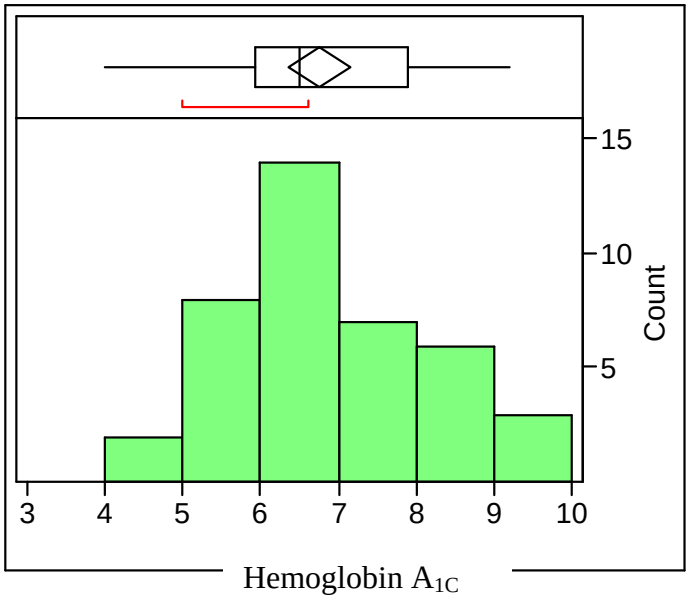
f) The American Diabetes Association suggests action be taken when A_{1C} values get too high. How many individuals have an A_{1C} value of 7.5 % and above?

There are 15 individuals in the data set with an A_{1C} value of 7.5 % and above.

Extra Credit: Get JMP to produce the histogram with classes specified in problem 2.44. Turn in the JMP output with this histogram.



JMP Output for Hemoglobin A_{1C}



Stem	Leaf	Count
9	022	3
8		
8	000012	6
7	567799	6
7	2	1
6	555667	6
6	00001244	8
5	666779	6
5	00	2
4	8	1
4	0	1

4|0 represents 4.0

Quantiles

100.0%	maximum
75.0%	quartile
50.0%	median
25.0%	quartile
0.0%	minimum

Moments

9.2000	Mean	6.765
7.9000	Std Dev	1.2507536
6.5000	Std Err Mean	0.1977615
5.9250	upper 95% Mean	7.1650104
4.0000	lower 95% Mean	6.3649896
	N	40