Math 153 - Quiz 4

February 15, 2018

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) Refer to the snowfall data on the attached sheet.

   (a) Find the percentile for the value 13.1.

   $$\frac{26 \text{ VALUES LESS THAN } 13.1}{44 \text{ TOTAL VALUES}} \qquad \frac{26}{44} \approx 59\%$$

   59TH PERCENTILE

   (b) Find the value of the 85th percentile.

   $$\frac{L}{44} = 0.85 \Rightarrow L = 37.4 \qquad 38^{TH} \text{ VALUE} = 18.9 \text{ INCHES}$$

   (c) Find the value of the 25th percentile.

   $$\frac{L}{44} = 0.25 \Rightarrow L = 11 \qquad \frac{11^{TH} + 12^{TH}}{2} = \frac{4.3 + 5.0}{2} = \frac{9.3}{2}$$

   $= 4.65$ INCHES

2. (1 point) The sample mean and standard deviation of the January snowfall data are approximately 11.345 and 8.316, respectively. Find the z-score corresponding to 9.5 in.

   $$Z = \frac{9.5 - 11.345}{8.316} \approx -0.22$$

3. (4 points) Find the 5-number summary, the IQR, and the outlier cutoffs for the snowfall data.

5-NUMBER SUMMARY:

$$MED = \frac{22^{ND} + 23^{RD}}{2} = 10.0$$

$$Q_1 = \frac{11^{TH} + 12^{TH}}{2} = \frac{4.3 + 5.0}{2} = 4.65$$

$$Q_3 = \frac{33^{RD} + 34^{TH}}{2} = \frac{15.5 + 16.8}{2} = 16.15$$

$MIN = 0.4$

$MAX = 34.3$

$IQR = 16.15 - 4.65 = 11.5$

CUTOFFS: $Q_1 - 1.5(11.5) = -12.6$

$Q_3 + 1.5(11.5) = 33.4$

January Snowfall at O'Hare Airport (Inches)

1960-2005 (Excluding 1997 and 1998)

0.4	0.5	1.5	1.6	2.0	3.0	3.2	3.5	3.5	3.7
4.3	5.0	5.4	5.6	5.9	6.2	6.9	7.2	7.4	7.6
9.5	10.0	10.0	10.4	11.1	11.7	13.1	13.6	14.2	14.6
15.2	15.5	15.5	16.8	17.2	17.3	18.6	18.9	21.9	22.9
25.1	27.8	29.6	34.3						