

Stat 104 – Homework 2 Solution

Assignment:

1. Complete the following problems from the text: 2.3, 2.4, 2.13, 2.15, 2.21, 2.23, 2.30, 2.35, 2.48, 2.49, 2.65, and 2.76.

If you have questions about the answers to these problems, see your course instructor.

2. A hog producer wishes to see how much weight hogs gain when they are fed their normal feed for a period of 30 days. Below are data on 35 hogs. Weight gain is in pounds.

41, 43, 47, 57, 47, 48, 48, 49, 52, 52, 53, 53, 55, 56, 62,
42, 64, 66, 36, 46, 46, 48, 50, 50, 52, 53, 52, 54, 54, 55,
56, 57, 58, 59, 64

Enter the data into a single column, labeled Weight Gain, 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.

- a) Answer the question Who? for these data.

Data are collected on hogs.

- b) Answer the question What? for these data. What kind of variable is this? If it is a categorical variable give the categories, if it is a quantitative variable give the units.

The variable is weight gain.

This is a quantitative variable with units of pounds.

- c) Describe the shape of the histogram produced by JMP.

The shape is symmetric and mounded in the middle.

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

Minimum = 36 pounds
Lower Quartile = 48 pounds
Median = 52 pounds
Upper Quartile = 56 pounds
Maximum = 66 pounds

- e) According to the box plot are there any weight gains that are considered outliers? Explain briefly.

No. There are not values indicated as being outside the fences on the box plot.

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

Sample mean weight gain = 52.1 pounds
Sample standard deviation of weight gain = 6.70 pounds

- g) Which summary is more appropriate for these data the five number summary or the sample mean and sample standard deviation? Support your choice statistically.

The sample mean and sample standard deviation are most appropriate because the distribution of the data is symmetric and mounded in the middle.

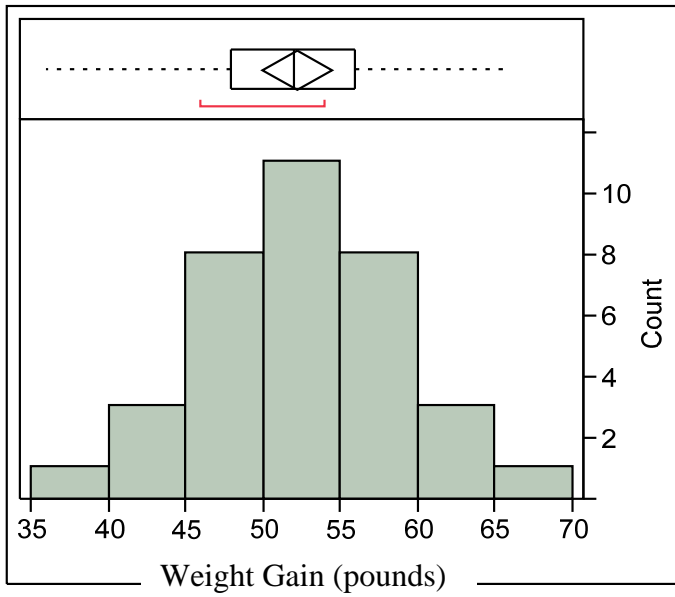
- h) Does JMP use a split stem when producing the stem-and-leaf display?

JMP uses a split stem there are two rows for each 10 pound stem.

- i) A healthy hog should gain at least 1.5 pounds a day. Using this information and the analysis of the weight gain data what can you say about the health of the producers' hogs?

If a healthy hog gains at least 1.5 pounds a day, then over 30 days a healthy hog should gain at least 45 pounds. On average, the 35 hogs gained a little over 52 pounds so one might conclude that the hogs are healthy, on average. There are 4 hogs that gained less than 45 pounds, while the rest $31/35 = 89\%$, gained 45 or more pounds. One might conclude that about 90% of the producers' hogs are healthy. Of course, all of the hogs may be healthy but because of competition at the feed trough some (the 4 hogs who gained less) may not have gotten a full ration of feed each day.

Distribution of Weight Gain



Stem	Leaf	Count
6	6	1
6	244	3
5	55667789	8
5	00222233344	11
4	66778889	8
4	123	3
3	6	1

3|6 represents 36

Five Number Summary

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

Summary Statistics

66 Mean	52.142857
56 Std Dev	6.6956652
52 N	35
48	
36	