Stat 101: Lecture 6

Sample Mean Octane Rating

- Total = 3637.9
- n = 40

$$\bar{y} = \frac{\textbf{\textit{Total}}}{\textbf{\textit{n}}} = \frac{\textbf{3637.9}}{\textbf{40}} = \textbf{90.95}$$

1

Mean or Median?

- The sample mean is the balance point of the distribution.
- The sample median divides the distribution into a lower and an upper half.

2

Mean or Median?

- For skewed data, report the sample median.
- For symmetric data with no outliers, report the sample mean.

3

Stat 101: Lecture 6

Measures of Spread

- Based on the deviation from the sample mean.
- Deviation

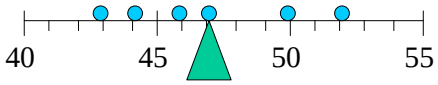
$$(y - \bar{y})$$

4

9-hole Golf Scores

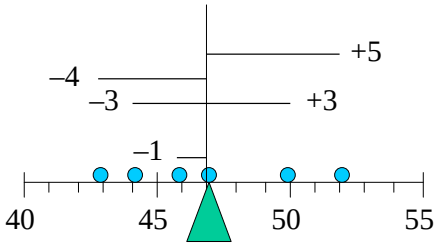
46, 44, 50, 43, 47, 52

$$\bar{y} = \frac{282}{6} = 47 \text{ strokes}$$



5

Deviations



6

Stat 101: Lecture 6

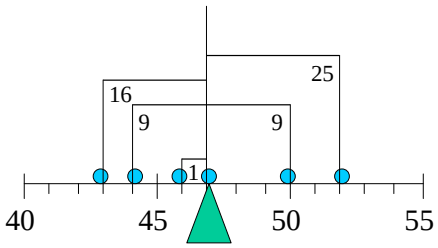
Sample Variance

Almost the average squared deviation

$$s^2 = \frac{\left(\sum (y - \bar{y})^2\right)}{n-1}$$

7

Squared Deviations



8

Sample Variance

$$\boldsymbol{s^2 = \frac{(16+9+1+0+25+9)}{5} = \frac{60}{5}}$$

$$\boldsymbol{= 12\ \text{strokes}^2}$$

9

Stat 101: Lecture 6

Sample Standard Deviation

$$s = \sqrt{s^2} = \sqrt{\frac{\left(\sum (y - \bar{y})^2\right)}{n-1}}$$

$$s = \sqrt{12} = 3.46 \text{ strokes}$$

10

JMP

- Octane values entered into a single column with 40 rows.
- Analyze – Distribution
- Y, Columns - Octane
- OK

11

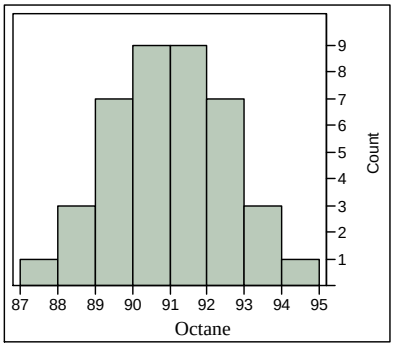
Distribution of Octane

- Distribution
  - –Stack
- Octane
  - –Histogram Options – Count Axis
- Use the “grabber” to adjust the bins on the histogram.

12

Stat 101: Lecture 6

Histogram



13

Quantiles

100.0%	**Maximum**	**94.400**
99.5%		94.400
97.5%		94.383
90.0%		92.970
75.0%	**Quartile**	**92.200**
50.0%	**Median**	**90.850**
25.0%	**Quartile**	**89.825**
10.0%		88.940
2..5%		87.425
0.5%		87.400
0.0%	**Minimum**	**87.400**

14

Moments

Mean	90.9475
Std Dev	1.530039
Std Err Mean	0.2419204
upper 95% Mean	91.43683
lower 95% Mean	90.45817
N	40

15