

Week 02 Quiz

Problem 1

Which of the following is NOT a measure of central tendency?

- A) Mean
- B) Median
- C) Mode
- D) Standard Deviation

Answer: D) Standard Deviation

Problem 2.

What is the mean of the numbers 5, 7, 9, 11, and 13?

- A) 7
- B) 9
- C) 10
- D) 11

Answer: B) 9 (Mean = $(5+7+9+11+13)/5 = 45/5 = 9$)

Problem 3

What is the median of the dataset: 3, 5, 7, 9, 11?

- A) 5
- B) 7
- C) 9
- D) 6

Answer: B) 7 (Middle value in an ordered odd-sized dataset)

Problem 4

If a dataset has a mean > median > mode, it is likely:

- A) Symmetric
- B) Negatively skewed
- C) Positively skewed
- D) Normally distributed

Answer: C) Positively skewed (Right-skewed distribution)

Problem 5

The following are the sorted scores (out of 100) of 15 students in an exam:

45, 52, 58, 62, 65, 70, 72, 75, 78, 80, 85, 88, 90, 92, 95

What is the 40th percentile of the exam scores? [Hint: if your answer is not listed, choose the one that is closest to your answer]

- A) 65
- B) 69
- C) 71
- D) 75

Answer: C) 71

Explanation: Position = $0.40 \times 15 = 6$. The 40th percentile is $(x_6 + x_7)/2 = (70+72)/2 = 71$.

Problem 6

The ages (in years) of 10 employees in a company are:

22, 25, 26, 28, 30, 32, 35, 40, 45, 50

What is the 90th percentile of the employees' ages? [Hint: if your answer is not listed, choose the one that is closest to your answer]

- A) 45
- B) 47.5
- C) 50
- D) 48.5

Answer: B) 47.5

Explanation: Position = $0.90 \times 10 = 9$. Since it's an integer, average the 9th and 10th values: $(45+50)/2 = 47.5$.

Problem 7

The weights (in grams) of 9 apples are:

100, 105, 110, 115, 120, 125, 130, 135, 140

What is the 60th percentile of apple weights? [*Hint: if your answer is not listed, choose the one that is closest to your answer*]

- A) 125
- B) 127.5
- C) 130
- D) 132.5

Answer: A) 125

Explanation: Position = $0.60 \times 9 = 5.40$. Since it's not an integer, 6th value, which is 125.)

Problem 8

The five-number summary for monthly rainfall (in cm) in a city is:

Minimum = 1.2, Q1 = 3.5, Median = 5.0, Q3 = 7.8, Maximum = 12.4

What is the interquartile range (IQR)?

- A) 4.3 cm
- B) 5.6 cm
- C) 7.8 cm
- D) 11.2 cm

Answer: A) 4.3 cm *(IQR = Q3 – Q1 = 7.8 – 3.5 = 4.3 cm.)*

Problem 9

Given the following dataset (sorted for convenience):

12, 15, 18, 20, 22, 25, 28, 30, 32, 35, 38, 40, 42, 45, 48, 50, 52, 55, 58, 60, 62, 65, 68, 70, 72, 75, 78, 80, 82, 85

What is the correct five-number summary? [*Hint: if your answer is not listed, choose the one that is closest to your answer*]

- A) Min=12, Q1=30, Median=49, Q3=68, Max=85
- B) Min=12, Q1=28, Median=50, Q3=70, Max=85
- C) Min=12, Q1=30, Median=50, Q3=70, Max=85
- D) Min=12, Q1=25, Median=48, Q3=72, Max=85

Answer: A) Min=12,
Q1=30,
Median=50,
Q3=70,
Max=85

*(Median: $L = 0.5 * 20 = 15$, the average of 15th & 16th values $(48+50)/2 = 49$;
Q1: $L = 0.25 * 30 = 7.5 \rightarrow L = 8$, Q1 = 8th data value = 30;
Q3: $L = 0.75 * 30 = 22.5 \rightarrow 23$, Q3 = 23rd data value = 68.)*

Problem 10

A dataset has 30 values:

10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68

What is the median (Q2)? [Hint: if your answer is not listed, choose the one that is closest to your answer]

- A) 38
- B) 39
- C) 40
- D) 42

Answer: B) 39

(Median = average of 15th (38) and 16th (40) values = $(38+40)/2 = 39$.)

Problem 11

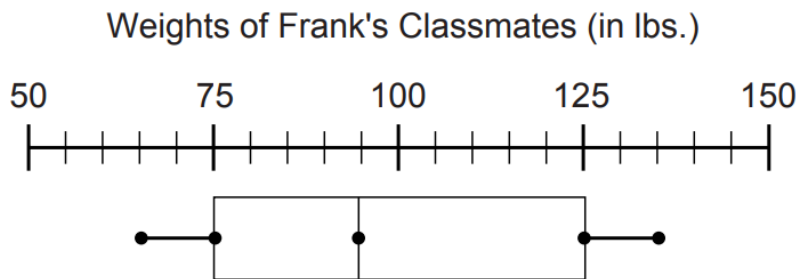
A dataset of 30 values has a minimum of 10 and a maximum of 100, but one extreme outlier (1000) is introduced. How does this affect the five-number summary?

- A) Only the maximum changes
- B) Q1, Q3, and median change
- C) Only the minimum and maximum change
- D) The entire five-number summary changes

Answer: A) Only the maximum changes
(Outliers affect only the min/max, not quartiles or median, unless they shift the data distribution drastically.)

Problem 12

According to the following box-and-whisker plot, what was the lower quartile weight of Frank's classmates?

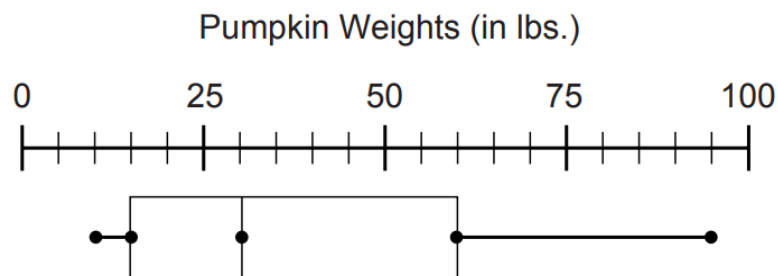


- (a) 65
- (b) 95
- (c) 75
- (d) 125

Answer c

Problem 13

According to the box-and-whisker plot, what was the median weight of a pumpkin at the annual pumpkin festival?



- A) 30
- B) 52.5
- C) 37.5
- D) 60

Answer A

Problem 13

What best describes a z-score:

- A). It is the average of all raw scores in a normal distribution
- B). It is the measure of dispersion in a distribution of scores
- C). It is the position of a score relative to the mean
- D). It is the frequency of a score in standardized units

Answer C

Problem 14

For a population with $\mu = 80$ and $\sigma = 12$, what is the z-score corresponding to $X = 71$?

- A). -0.50
- B). -0.75
- C). -1.00
- D). -1.5

Answer B

Problem 15

For a population with $\sigma = 10$, a score of $X = 60$ corresponds $z = -1.5$. What is the population mean?

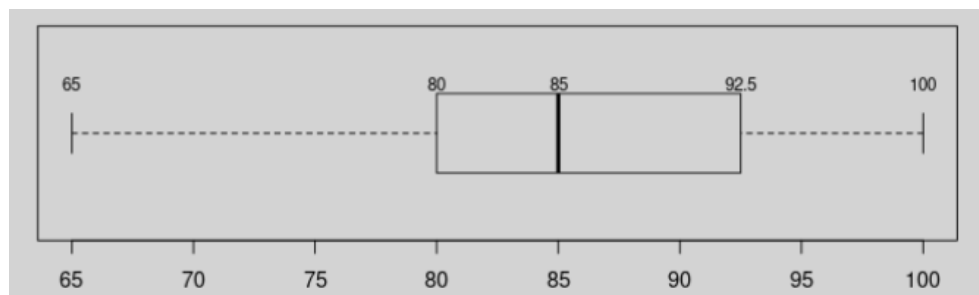
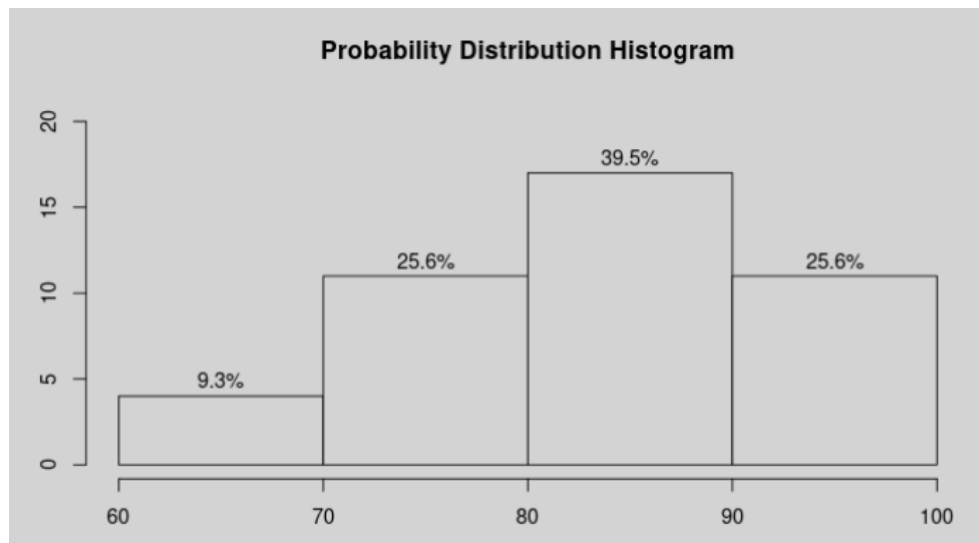
- A). 30
- B). 45
- C). 75
- D). 90

Answer C

$$(60 - \mu)/10 = -1.5 \rightarrow 60 - \mu = -1.5 * 10 = -15 \rightarrow \mu = 60 + 1.5 * 10 = 75$$

Summary of Week #2 Assignment

cut.data.freq	Freq	midpts	rel.freq	cum.freq	rel.cum.freq
[6e+01,7e+01]	4	65.00	0.09	4	0.09
(7e+01,8e+01]	11	75.00	0.26	15	0.35
(8e+01,9e+01]	17	85.00	0.40	32	0.74
(9e+01,1e+02]	11	95.00	0.26	43	1.00



stats	value
Min.	65.00
1st Qu.	80.00
Median	85.00
3rd Qu.	92.50
Max.	100.00