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 = $0.40 \times 15 = 60.40 \times 15 = 6$. The 40^{th} 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 = $0.90 \times 10 = 90.90 \times 10 = 9$. Since it's an integer, average the 9th and 10th values: $(45+50)/2 = 47.5(45+50)/2 = 47.5$.

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 = $0.60 \times 9 = 5.4$. 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=68,
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➔ L = 8, Q1 = 8th data value = 30;
Q3: L = 0.75*30 = 22.5 ➔ 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

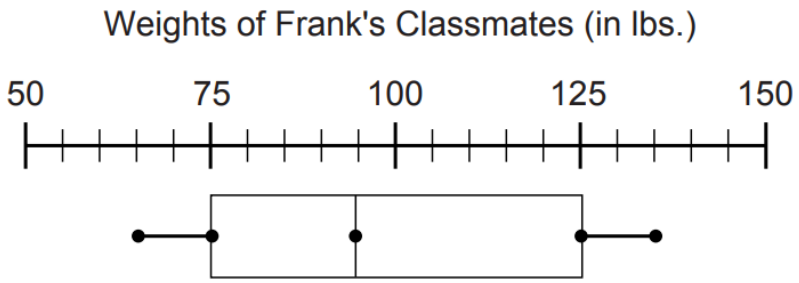
A dataset of 30 values has a minimum of 10 and a maximum of 100, but one extreme outlier (1000) is introduced. How does this affect the five-number summary?

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

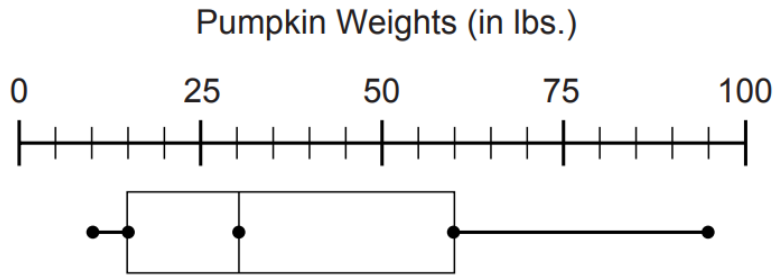
(c) 75

(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 14

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 15

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 16

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

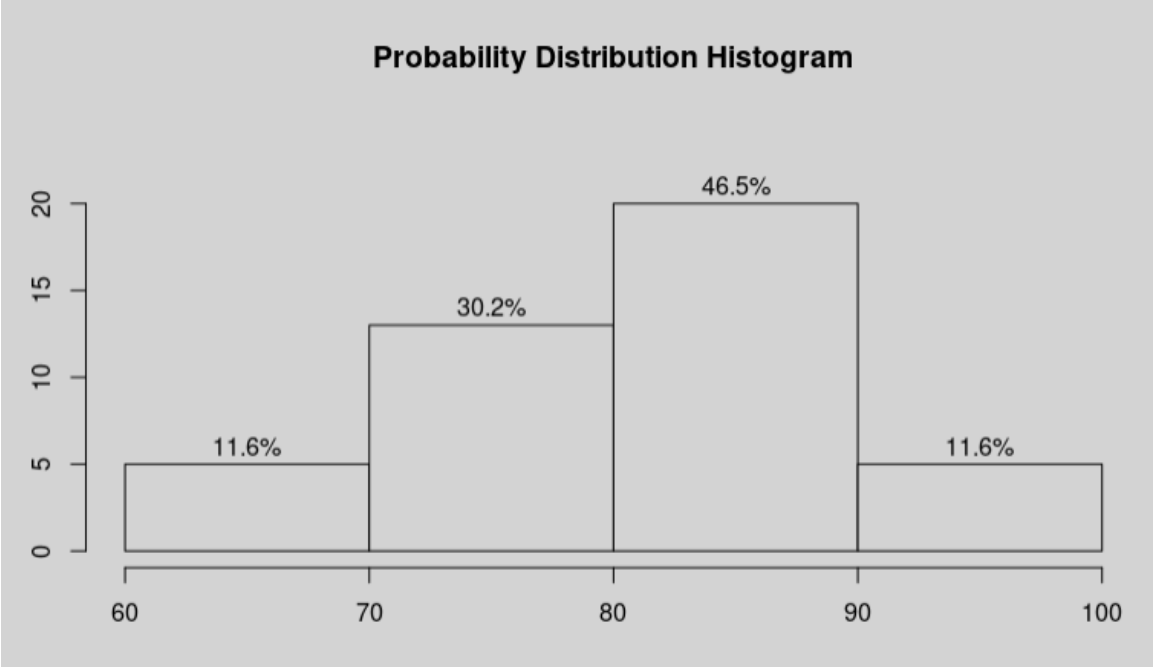
A). 30
B). 45
C). 75
D). 90

Answer C
(60 – μ)/10 = -1.5 ➔ 60 – μ = -1.5*10 = -15 ➔ μ = 60 + 1.5*10 = 75

Summary of Week #2 Assignment

The class boundary is: 60,70,80,90,100

cut.data.freq	Freq	midpts	rel.freq	cum.freq	rel.cum.freq
[6e+01,7e+01]	5	65.00	0.12	5	0.12
(7e+01,8e+01]	13	75.00	0.30	18	0.42
(8e+01,9e+01]	20	85.00	0.47	38	0.88
(9e+01,1e+02]	5	95.00	0.12	43	1.00



1. Five Number Summary :

The five-number summary is use used to describe the shape of the distribution of a given numerical data. It consists of five numbers: minimum data value, first quartile, median, the third quartile, and the maximum data value.

The five-number summary of this given data set is:

stats	value
Min.	65.00
1st Qu.	75.00
Median	85.00
3rd Qu.	90.00
Max.	100.00

2. Boxplot :

The boxplot is a geometric representation of the five-number summary. The boxplot of the given data set is given below.