BALUCOS, CARLO B. WEEK 6 and 7

ME2C MATH EDA

PROGRESS CHECK ANSWERS

1. Sara is taking a flying course and how to write six tests. Her result were: 65, 66, 100, 63, 64, 63.

a. find the mean, median and mode for this data.

$$\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 \ldots}{n}$$

$$= \frac{65 + 66 + 100 + 63 + 64 + 63}{6}$$

mean = 70.17

Data from least to greatest:

63, 63, 64, 65, 66, 100

Thus:

$$\text{median} = \frac{64 + 65}{2}$$

median = 64.5

mode = 63

2. A recent newspaper article stated the average income for people living on Sine Street was $99 500. A letter was written to the editor of the newspaper claiming that the average income for people living on sine street was $30,000. Below is the breakdown of income of the residents of Sine Street.

A. Table:

Name	Income
Baker	$500,000
Smith	$220,000
Simpson	$70,000
Ford	$60,000
Campbell	$40,000
Wyatt	$30,000
Grant	$30,000
Bender	$20,000
Burns	$15,000
Milhouse	$10,000

a. Using measures of central tendency, determine the position each person took on this issue.

- If the data is arranged from highest to lowest income, then:

Baker - 1st place
Smith - 2nd place
Simpson - 3rd Place
Ford - 4th Place
Campbell - 5th Place
Wyatt - 6th Place
Grant - 6th Place
Bender - 7th Place
Burns - 8th Place
Milhouse - 9th Place

b. which measure of central tendency do you think gives the best picture of the "average" income on sine street?

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c. which information is best to use: the one from the newspaper article or the one in the letter to the editor? why?

- the one from the newspaper is the best information to use because based on the data that is solved through the measure of central tendency specifically by the mean, it has the same value with the newspaper that is $99,500.

3. In some olympic events such as gymnastics, the final mark is determined by dropping the lowest and highest scores that a contestant receives from the panel of judges. Use the scores given below to answer the following questions.

Gymnast # 1 scores	Gymnast # 2 scores
8.8	9.4
8.7	9.6
8.6	6.0
8.8	8.0
6.5	9.2
9.7	9.2
9.9	9.1

a. Without dropping the high and low score, calculate the three measures of central tendency for each gymnast?

For Gymnast # 1:

$$\text{mean} = \frac{8.8 + 8.7 + 8.6 + 8.8 + 6.5 + 9.7 + 9.9}{7}$$

mean = 8.71

If data is arranged from least to greatest:
6.5, 8.6, 8.7, 8.8, 8.8, 9.7, 9.9

then:
median = 8.8
mode = 8.8

For Gymnast # 2:

$$\text{mean} = \frac{9.4 + 9.6 + 6.0 + 8.0 + 9.2 + 9.2 + 9.1}{7}$$

mean = 8.64

If data is arranged from least to greatest:
6.0, 8.0, 9.1, 9.2, 9.2, 9.4, 9.6

then:
median = 9.2
mode = 9.2

b. Which gymnast would win the gold if the mean was used? the median? the mode?

- If the mean will be the basis to win the gold, then the gymnast # 1 will win the gold.
- If the median will be the basis to win the gold, then the gymnast # 2 will win the gold.
- If the mode will be the basis to win the gold, then the gymnast # 2 will win the gold.

c. Drop the high and low scores, recalculate the mean, median, and mode for each gymnast.

For gymnast # 1

$$\text{mean} = \frac{8.6 + 8.7 + 8.8 + 8.8 + 9.7}{5}$$

mean = 8.92

If the data is arranged from least to greatest:
8.6, 8.7, 8.8, 8.8, 9.7

then:
median = 8.8
mode = 8.8

For gymnast # 2

$$\text{mean} = \frac{8.0 + 9.1 + 9.2 + 9.2 + 9.4}{5}$$

mean = 8.98

If data is arranged from least to greatest:
8.0 + 9.1 + 9.2 + 9.2 + 9.4

then:
median = 9.2
mode = 9.2

d. In real Olympic competition (when the high and low score are dropped), the mean is used to decide the medal winners. which gymnast would win?

- the gymnast # 2 would probably win.

e. Why do you think the high and low scores are dropped?

Owing to the fact that the low and high scores can be considered as the outliers. which are values that lies on abnormal distance from other values or scores of gymnasts. thus, it can cause biases or influence estimates because it can have a disproportionate effect on statistical results especially the mean.

4. Greenwood Manufacturing is trying to recruit new employees so they can expand their company. In the advertisement they claim that the average salary of an employee is $44 000 a year. Below is a chart showing the payroll information for greenwood.

Job Title	Number of Employees (f)	Salary (x)	f(x)
President	1	$250 000	$ 250 000
Vice-President	1	$130 000	$130 000
Plant manager	2	$ 75 000	$150 000
Supervisor	10	$ 50 000	$500 000
Labourer	30	$ 37 000	$1110 000
Sales Clerk	10	$ 24000	$ 240 000

$\Sigma f = 54$ $\Sigma f(x) = \$2\,380\,000$

a. Determine the mean, median and mode.

$$\text{mean}(\bar{x}) = \frac{\Sigma f(x)}{\Sigma f} = \frac{\$2\,380\,000}{54} = \$44{,}074.07$$

mode = the most number of frequency

= $37 000

median = $37 000

b. Is the company falsely advertising when they said that the average salary is $44 000?

- The company doesn't advertised it falsely since the computed mean or average salary of the employees is $ 44,074.07 which is almost near to $44 000.

c. what measure (mean, median, mode) is most appropiate to show what a typical salary is for an employee? why?

- Probably the mean, when we say typical, it talks about the standard or average. Thus, it may use as a representation of something just like a salary of an employee

5. The mean height of engineering students in a certain university is 164 centimeters and the standard deviation is 10 cm. Assuming the heights are normally distributed, what percent of the heights is greater than 168 centimeters.

Given: $\mu = 164$ cm
$\sigma = 10$ cm
$h > 168$ cm

Sol'n: $P(h > 168)$

$$P\left(h > \frac{168 - 164}{10}\right)$$

$$P(h > 0.4) = 0.3446 \times 100\%$$

$$= 34.46\%$$