

3.4 Measures of Central Tendency

A Mean

- ✓ add all values in a set of data and divide by the number of values
- ✓ mean is called also average

μ = "Mio"

$$\mu = \frac{v_1 + v_2 + v_3 + \dots + v_n}{n}$$

Example 1. The students' test scores in MBF3C class are given below. Find the mean of these scores.

67, 56, 81, 92, 63, 78, 82, 97, 100, 43, 55

$n = 11$

$$\mu = \frac{67 + 56 + 81 + 92 + 63 + 78 + 82 + 97 + 100 + 43 + 55}{11} = \frac{814}{11} = 74$$

∴ The mean is 74

Example 2. The table below show data about how many hours spent on social networks usage by a group of students.

Number of hours	0	1	2	3	4	5	6
Number of students	1	3	5	6	4	2	0

Find the mean of the number of hours spent on social networks.

0 1 1 1 2 2 2 2 2

3 5

$\mu = \frac{1 \times 0 + 3 \times 1 + 5 \times 2 + 6 \times 3 + 4 \times 4 + 2 \times 5}{1 + 3 + 5 + 6 + 4 + 2 + 0} = \frac{57}{21} = 2.71$

∴ student spends in average 2.71 hours per day on social networks

B Median

To find the median

- ✓ sort (order) the values in the given set
- ✓ find the middle value (if there is only one)
- ✓ find the mean of the middle values (if there are two values in the middle)

Example 3. For each of the following cases, find the median.

a) ~~2, 5, 2, 7, 3, 10, 3, 2, 8, 9, 1, 0, 5~~

① 0 1 2 2 2 3 3 5 5 7 8 9 10 (order)

6 #s 6 #s

∴ Median value is 3

b) ~~5, 2, 8, 5, 1, 0, 3, 6, 7, 2, 8, 3, 1, 8~~

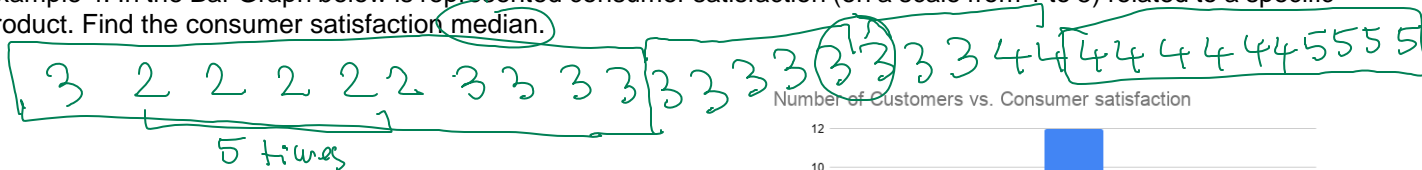
0 1 1 2 2 3 3 5 5 6 7 8 8 8

7 #s 7 #s

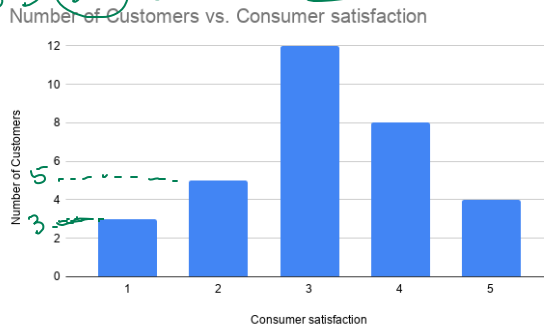
$\frac{3 + 5}{2} = 4$

∴ Median is 4

Example 4. In the Bar Graph below is represented consumer satisfaction (on a scale from 1 to 5) related to a specific product. Find the consumer satisfaction median.



∴ Median of the consumer satisfaction is 3



C Mode

✓ The value(s) that occurs most often in the set of data

Example 5. Calculate the mode for each set of data.

a) 3, 7, 5, 13, 20, 23, 39, 23, 40, 23, 14, 12, 56, 23, 29

∴ The mode is 23

b) 1, 3, 3, 3, 4, 4, 6, 6, 6, 9

3 → 3 times ✓
 4 → 2 times
 6 → 3 times ✓

∴ We have

two modes: 3 and 6

D Technology

Use technology (calculator or online applications) to compute faster the mean, median, and the mode for a set of data.

Example 6. Calculate the mean, median, and mode for the following set of data (students' scores on a test) by using the online [Mean, Median, Mode Calculator](#).

43, 67, 82, 45, 95, 87, 93, 95, 98, 87, 66, 75, 82, 77, 82, 90, 12, 90, 82

Which of them is the best measure of central tendency? Explain.