**LESSON 10**

**WEEK 13 AND WEEK 14**

**LEARNING OUTCOMES**

At the end of this lesson students should be able to calculate mean for raw data and grouped data, calculate mode using inspection, formula and histogram, calculate median using formula and ogive.

**TOPIC OUTLINES**

**Mean, mode and median for raw data and grouped data**

**1. Mean**

- mean is the average
- can be applied by the formula:

**For Grouped Data**

$$\text{Mean} = \sum fx / \sum f$$

Where

$\sum$ = sum or total
f = frequency
x = midpoint



***Example 1***:

| Weight (kg) | No. of Students |
|---|---|
| 50-52 | 3 |
| 53-55 | 1 |
| 56-58 | 5 |

| Weight (kg) | No. of Students (f) | Midpoint (x) | fx |
|---|---|---|---|
| 50-52 | 3 | 51 | 153 |
| 53-55 | 1 | 54 | 54 |
| 56-58 | 5 | 57 | 285 |
| | $\sum f = 9$ | | $\sum fx = 492$ |

$$\text{Mean} = \sum fx / \sum f$$
$$= 492 / 9$$
$$= \underline{54.67 \text{ kg}}$$

**For Raw Data**

Mean = $\sum x_i / n$

Where

$\sum$ = sum or total
$x_i$ = each data
n = no. of data collected

***Example 2***: Weight for 7 students are 57 kg, 51 kg, 56 kg, 52 kg, 50 kg, 57 kg and 58 kg. Find the mean.

Mean = $\sum x_i / n$
= (57 + 51 + 56 + 52 + 50 + 57 + 58) / 7
= 381 / 7
= 54.43 kg

## 2. Mode

- the value which occurs with the greatest frequency
- the most common value
- can be found by:
  (a) inspection
  (b) histogram
  (c) formula



***Example 1*** : Find the mode for
2, 2, 5, 7, 9, 9, 9, 10, 10

Mode = 9

***Example 2***: Find the mode

| Grade | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| No. of students | 40 | 60 | 60 | 50 |

Mode = 2 and 3

***Example 3***: Find the mode
1, 2, 3, 4, 5, 6, 7, 8
No mode.

## 3. Median

- The median of a set of numbers arranged in order of magnitude is the middle value or the arithmetic mean of the two middle values.

***Example 1***: Find the median for
7, 5, 9, 15, 11

Rearrange: 5, 7, 9, 11, 15

Median = 9

***Example 2***: Find the median for
4, 1, 3, 7, 5, 9

Rearrange: 1, 3, 4, 5, 7, 9

Median = ½ * (4+5)

= 4.5

**Exercise**

State the formula used to calculate the mean for grouped data.
State the formula used to calculate the median for grouped data.

**Basic Reading**

LCCI, Business Statistics, Saravanan Kullandavelu, page 3.4-3.12