Measures of Central tendency

The general tendency of a data to cluster around a central or mid value is called Central Tendency of data. In other words. a measure of central tendency is a number used to represent the center or middle of a set of data values. The mean, median, and mode are three commonly used measures of central tendency

Note: Data is of three types, ungrouped data, grouped discrete data and grouped continuous data.

Arithmetic Mean

Formulas:

(a) For ungrouped data: $\bar{x} = \frac{\sum x}{n}$ [where n= number of observations]

(b) For grouped discrete data: $\bar{x} = \frac{\sum fx}{N}$

[where f= frequency, N= $\sum f = total\ frequency$]

(c) For grouped continuous data: $\bar{x} = \frac{\sum fx}{N}$ [where x= mid point of class]

Problems

1) Find the A.M for the following

64, 69, 72, 72, 75, 65

Ans: A.M. = $\frac{\sum x}{n}$ = 417/6 = 69.5

2) Find the Arithmetic mean for following

x	1	2	3	4	5	6	7	8
f	5	6	5	10	8	4	3	2

Ans: A.M. = $\frac{\sum fx}{N}$ = 173/43 = 4.02

3) Find the Arithmetic mean for following

Marks	0-10	10-20	20-30	30-40	40-50
Number of Student	12	13	21	19	15

Ans: A.M. = $\frac{\sum fx}{N}$ = 2120/80 = 26.5

4) Find the Arithmetic mean for following

Class interval	Frequency	New class interval	x (Mid point of class)	fx
5-9	10	4.5-9.5	7	70
10-14	8	9.5-14.5	12	96
15-19	14	14.5-19.5	17	238
20-24	12	19.5-24.5	22	264
25-29	18	24.5-29.5	27	486
30-34	10	29.5-34.5	32	320
35-39	7	34.5-39.5	37	259
Total	79			1733

Ans: A.M. = $\frac{\sum fx}{N}$ = 1733/79 = 21.94

Practice sums

1. Calculate the mean for the following distribution:

Size of Shoe:	6	7	8	9	10	11
No. of pairs:	32	40	52	40	32	25

[Answer: 8.3394 ~ 8]

2. The following data represents distribution of marks (out of 10) for a class of students. Find the arithmetic mean.

Marks:	0	1	2	3	4	5	6	7	8	9	10
No. of Students:	2	4	5	7	11	15	13	10	7	3	1

[Answer: 5.06]

3. The following data represents yield per acre (in kgs.) for a number of farms. Find the arithmetic mean.

Yield per acre:	700-750	750-800	800-850	850-900	900-950	950-1000
No. of farms:	32	43	55	22	17	18

[Answer: 825.8 kgs.]

4. The following is the distribution of heights in cms of 50 students. Find the mean.

Height in cms:	140-145	145-150	150-155	155-160	160-165
No. of students:	7	10	15	13	5

[Answer: 152.4 cms]

5. Find the arithmetic mean:

Height in cms:	148-152	152-156	156-160	160-164	164-168	168-172	172-176
No. of persons:	3	5	9	15	10	6	2

6. The following data represents the distribution of balance amounts in bank accounts at the end of March 2002. Find the average balance amount.

Amount in Rs.:	500-599	600-699	700-799	800-899	900-999	1000-1099	1100-1199	1200-1299
No. of accounts:	25	42	55	70	62	50	35	11

[Answer: Rs.877.21]