Arithmetic Mean

Continuous Series $\dot{X}=\sum fm/n$

Example: From the following data calculate arithmetic mean.

Wages	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of person	5	2	3	10	3	2	5

Solution:

Wages	No. of person (f)	Mid-value (m)	fm
0-10	5	(0+10)/2=5	5x5=25
10-20	2	(10+20)/2=15	30
20-30	3	25	75
30-40	10	35	350
40-50	3	45	135
50-60	2	55	110
60-70	5	65	325
	n=30		∑fm=1050

$\dot{X}=\sum fm/n=1050/30=35$

Short Cut Method $\dot{X}=A+\sum fu.h/n$

Example: Compute the arithmetic mean from the rainfall data.

Rainfall (in mm)	No. of Days
30-35	5
35-40	6
40-45	11
45-50	18
50-55	19
55-60	15
60-65	13
65-70	1
70-75	2

Solution: Since the class interval of 5 is common in all classes then $\dot{X}=A+\sum fu.h/n$ formula will be used.

Rainfall (in mm)	No. of Days (f)	Mid value (x)	u=(x-A)/h	fu
30-35	5	(30+35)/2=32.5	(32.5-52.5)/5= -4	(5x-4)=-20
35-40	6	37.5	-3	-18
40-45	11	42.5	-2	-22
45-50	18	47.5	-1	-18
50-55	19	A=52.5	0	0
55-60	15	57.5	1	15
60-65	13	62.5	2	26
65-70	1	67.5	3	3
70-75	2	72.5	4	8
				∑fu=(-26)

n=∑f=90

Here A or Am=52.5 A or Am=Assumed mean

h=5

$\dot{X}$=A+∑fu.h/n

52.5+(-26x5)/90=

51.06

Example: The following table gives the distribution of salaries of 132 workers in a factory. Calculate the average salary of the workers in the factory.

Salary (in Rs.)	No. of Workers
50-60	8
60-70	12
70-80	15
80-100	20
100-120	22
120-150	25
150-200	30

Solution: As the class interval in this exercise is not the same for all the classes, the AM of the above example may be computed either by using the formula $\dot{X}= \sum fx/n$ or $\dot{X} =A+\sum fu/n$, both method will give similar result.

Salary (in Rs.)	No. of Workers (f)	Mid value of classes (x)	u=x-A	fx	fu	
50-60	8	50+60=110/2=55	-35	8x55=440	8x-35=-280	
60-70	12	65	-25	780	-300	
70-80	15	75	-15	1125	-225	-805
80-100	20	A=90	0	1800	0	
100-120	22	110	20	2420	440	
120-150	25	135	45	3375	1125	
150-200	30	175	85	5250	2550	+4115
	n=∑f=132			**∑fx=15190**	**∑fu=3310**	
	A=Am=90					

$\dot{X}= \sum fx/n$	$\dot{X} =A+\sum fu/n$
115.08	115.08

Reference: Statistical Methods in Geographical Studies-Aslam Mahmood