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Ex 15.1 Class 11 Maths Question 12.

Calculate the mean deviation about median age for the age distribution of 100 persons given below:

Age	Number
16 – 20	5
21 – 25	6
26 – 30	12

31 – 35	14
36 – 40	26
41 – 45	12
46 – 50	16
51 – 55	9

[Hint: Convert the given data into continuous frequency distribution by subtracting 0.5 from lower limit and adding 0.5 to the upper limit of each class interval]

Solution:

Age	Modified class	Mid values x_i	f_i	c.f.	$ x_i - 38 $	$f_i x_i - 38 $
16 – 20	15.5 – 20.5	18	5	5	20	100
21 – 25	20.5 – 25.5	23	6	11	15	90
26 – 30	25.5 – 30.5	28	12	23	10	120
31 – 35	30.5 – 35.5	33	14	37	5	70
36 – 40	35.5 – 40.5	38	26	63	0	0
41 – 45	40.5 – 45.5	43	12	75	5	60
46 – 50	45.5 – 50.5	48	16	91	10	160
51 – 55	50.5 – 55.5	53	9	100	15	135
			100			735

Here, $\frac{N}{2} = \frac{100}{2} = 50$ \therefore Median class is 35.5 – 40.5

Median (M) = $35.5 + \frac{50 - 37}{26} \times 5 = 35.5 + 2.5 = 38$

Mean deviation about median

$$= \frac{1}{N} \sum_{i=1}^n f_i |x_i - M| = \frac{735}{100} = 7.35$$