1. **Find the mean deviation about the mean for the data**
$38, 70, 48, 40, 42, 55, 63, 46, 54, 44$

Ans) The given data is
$38, 70, 48, 40, 42, 55, 63, 46, 54, 44$

Mean of the given data

$$\bar{x} = \frac{38+70+48+40+42+55+63+46+54+44}{10} = \frac{500}{10} = 50$$

The deviations of the respective observation from the mean $\bar{x}, i.e.\ x_i = \bar{x}$ are
$-12, 20, -2, -10, -8, 5, 13, -4, 4, -6$

The absolute values of the deviations i.e.$|x_1 - \bar{x}|$ are
$12, 20, 2, 10, 8, 5, 13, 4, 4, 6$

The required mean deviation about the mean is

$$M.D. = \frac{\sum_{i=1}^{10} |x_i - \bar{x}|}{10}$$

$$= \frac{12+10+2+10+8+5+13+4+4+6}{10}$$

$$= \frac{84}{10}$$

$$= 8.4$$

2. **Find the mean deviation about the mean for the data in**

x_i	10	30	50	70	90
f_i	4	24	28	16	8

Ans)

x	f	$f_1x_1 - dm$	$\lvert x - \overline{x}_m \rvert$	$f(x - x_m)$
10	4	40	24.25	97
30	24	720	4.25	102
50	28	140	15.75	441
70	16	1120	35.75	572
90	8	720	55.75	446
$N = 80$		2740		1658

$$\overline{x}_m = \frac{2740}{80} = 34.25$$

$$M.D = \frac{\sum f\,|x - x_m|}{N}$$

$$= \frac{1658}{80} = 20.725$$

3. Find the mean deviation about the mean for the data

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	6	8	14	16	4	2

Ans)

Computation of mean deviation from mean:

Class	mid value x_i	f_i	$d_i = \frac{x_i - 25}{10}$	$f_i d_i$	$\lvert x_i - \bar{x} \rvert = \lvert x_i - 29.8 \rvert$	$f_i \lvert x_i - \bar{x} \rvert$
0-10	5	6	-2	-12	24.8	148.8
10-20	10	8	-1	-8	14.8	118.4
20-30	15	14	0	-14	4.8	67.2
30-40	20	16	1	16	5.2	83.2
40-50	25	4	2	8	15.2	60.8
50-60	30	2	3	6	25.2	50.4
		$\Sigma f_i = N = 50$		$\Sigma f_i d_i = 24$		$\Sigma f_i \lvert x_i - 29.8 \rvert = 528.8$

Here, $N = 50$, $a = 25$, $h = 10$

$\therefore \bar{x} = a + h\left(\frac{\Sigma f_i d_i}{N}\right) = 25 + \frac{24}{50} \times 10 = 29.8$

Now,

$$\text{Mean deviation} = \frac{1}{N} \Sigma f_i \lvert x_i - \bar{x} \rvert$$

$$= \frac{1}{50} \times 528.8$$

$$= 10.576.$$