CHAPTER 14

Statistics

NCERT FOCUS

SOLUTIONS

EXERCISE - 14.1

1. We have the following table:

Number of plants	Number of Houses (f_i)	Class mark (x_i)	$f_i x_i$
0 - 2	1	1	1
2 - 4	2	3	6
4 - 6	1	5	5
6 - 8	5	7	35
8 - 10	6	9	54
10 - 12	2	11	22
12 - 14	3	13	39
Total	$\Sigma f_i = 20$		$\Sigma f_i x_i = 162$

∴ Mean, $\bar{x} = \frac{\sum f_i x_i}{\Sigma f_i} = \frac{162}{20} = 8.1$

Thus, mean number of plants per house is 8.1. We have used the direct method because values of x_i and f_i are small.

2. Let the assumed mean, $a = 550$

∵ Class size, $h = 20$

∴ $u_i = \frac{x_i - a}{h} = \frac{x_i - 550}{20}$

∴ We have the following table :

Class-interval	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 550}{20}$	$f_i u_i$
500 - 520	12	510	– 2	– 24
520 - 540	14	530	– 1	– 14
540 - 560	8	550	0	0
560 - 580	6	570	1	6
580 - 600	10	590	2	20
Total	$\Sigma f_i = 50$			$\Sigma f_i u_i = -12$

∴ Mean, $\bar{x} = a + h \times \left\{\frac{\sum f_i u_i}{\Sigma f_i}\right\}$

$= 550 + 20 \times \left(\frac{-12}{50}\right) = 550 - \frac{24}{5} = 550 - 4.8 = 545.2$

Hence, the mean daily wages of workers is ₹ 545.2.

3. Let the assumed mean, $a = 18$

∵ Class size, $h = 2$

∴ $u_i = \frac{x_i - a}{h} = \frac{x_i - 18}{2}$

Now, we have the following table:

Class-interval	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 18}{2}$	$f_i u_i$
11 - 13	7	12	– 3	–21
13 - 15	6	14	– 2	–12
15 - 17	9	16	– 1	–9
17 - 19	13	18	0	0
19 - 21	f	20	1	f
21 - 23	5	22	2	10
23 - 25	4	24	3	12
Total	$\Sigma f_i = (f + 44)$			$\Sigma f_i u_i = f - 20$

∴ Mean, $\bar{x} = a + h \times \frac{\sum f_i u_i}{\Sigma f_i}$

$\Rightarrow 18 = 18 + 2\left(\frac{f - 20}{f + 44}\right) \Rightarrow 0 = 2\left(\frac{f - 20}{f + 44}\right)$

$\Rightarrow 2(f - 20) = 0 \Rightarrow f = 20$

Thus, missing frequency is 20.

4. Let the assumed mean, $a = 75.5$

∵ Class size, $h = 3$

∴ $u_i = \frac{x_i - a}{h} = \frac{x_i - 75.5}{3}$

Now, we have the following table :

Class-interval	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 75.5}{3}$	$f_i u_i$
65 - 68	2	66.5	–3	–6
68 - 71	4	69.5	–2	–8
71 - 74	3	72.5	–1	–3
74 - 77	8	75.5	0	0
77 - 80	7	78.5	1	7
80 - 83	4	81.5	2	8
83 - 86	2	84.5	3	6
Total	$\Sigma f_i = 30$			$\Sigma f_i u_i = 4$

∴ Mean, $\bar{x} = a + h \times \left\{\frac{\sum f_i u_i}{\Sigma f_i}\right\} = 75.5 + 3 \times \frac{4}{30} = 75.5 + \frac{4}{10}$

$= 75.5 + 0.4 = 75.9$

Thus, the mean heartbeats per minute is 75.9.

5. Let the assumed mean, $a = 57$

∴ $d_i = x_i - 57$

Now, we have the following table:

Number of Mangoes	Frequency (f_i)	Class mark (x_i)	$d_i = x_i - 57$	$f_i d_i$
50 - 52	15	51	–6	–90
53 - 55	110	54	–3	–330
56 - 58	135	57	0	0
59 - 61	115	60	3	345
62 - 64	25	63	6	150
Total	$\Sigma f_i = 400$			$\Sigma f_i d_i = 75$

$\therefore$ Mean, $\bar{x} = a + \frac{\Sigma f_i d_i}{\Sigma f_i} = 57 + \frac{75}{400} = 57 + 0.1875$

$= 57.1875 \approx 57.19$

Thus, the average number of mangoes per box = 57.19.

We choose assumed mean method.

6. Let the assumed mean, $a = 225$

And class size, $h = 50$

$\therefore \quad u_i = \frac{x_i - a}{h} = \frac{x_i - 225}{50}$

Now, we have the following table:

Daily expenditure (in ₹)	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 225}{50}$	$f_i u_i$
100 - 150	4	125	–2	–8
150 - 200	5	175	–1	–5
200 - 250	12	225	0	0
250 - 300	2	275	1	2
300 - 350	2	325	2	4
Total	$\Sigma f_i = 25$			$\Sigma f_i u_i = -7$

$\therefore$ Mean, $\bar{x} = a + h \times \left(\frac{\Sigma f_i u_i}{\Sigma f_i}\right) = 225 + 50\left(\frac{-7}{25}\right)$

$= 225 + 2(-7) = 225 - 14 = 211$

Thus, the mean daily expenditure on food is ₹ 211.

7. Let the assumed mean, $a = 0.14$

Here, class size, $h = 0.04$

$\therefore \quad u_i = \frac{x_i - a}{h} = \frac{x_i - 0.14}{0.04}$

$\therefore$ We have the following table:

Class-intervals	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 0.14}{0.04}$	$f_i u_i$
0.00 - 0.04	4	0.02	–3	–12
0.04 - 0.08	9	0.06	–2	–18
0.08 - 0.12	9	0.10	–1	–9
0.12 - 0.16	2	0.14	0	0
0.16 - 0.20	4	0.18	1	4
0.20 - 0.24	2	0.22	2	4
Total	$\Sigma f_i = 30$			$\Sigma f_i u_i = -31$

$\therefore$ Mean, $\bar{x} = a + h \times \left[\frac{\Sigma f_i u_i}{\Sigma f_i}\right] = 0.14 + 0.04\left[\frac{-31}{30}\right]$

$= 0.14 - 0.041 = 0.099$

$\therefore$ Mean concentration of SO_2 in air is 0.099 ppm.

8. Using the direct method, we have the following table:

Number of days	Frequency (f_i)	Class mark (x_i)	$f_i x_i$
0 - 6	11	3	33
6 - 10	10	8	80
10 - 14	7	12	84
14 - 20	4	17	68
20 - 28	4	24	96
28 - 38	3	33	99
38 - 40	1	39	39
Total	$\Sigma f_i = 40$		$\Sigma f_i x_i = 499$

$\therefore$ Mean, $\bar{x} = \frac{\sum f_i x_i}{\Sigma f_i} = \frac{499}{40} = 12.475$

Thus, mean number of days a student remained absent = 12.48.

9. Let assumed mean, $a = 70$

Here, class size, $h = 10$

$\therefore \quad u_i = \frac{x_i - a}{h} = \frac{x_i - 70}{10}$

Now, we have the following table:

Literacy rate (in %)	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 70}{10}$	$f_i u_i$
45 - 55	3	50	–2	–6
55 - 65	10	60	–1	–10
65 - 75	11	70	0	0
75 - 85	8	80	1	8
85 - 95	3	90	2	6
Total	$\Sigma f_i = 35$			$\Sigma f_i u_i = -2$

$\therefore$ Mean, $\bar{x} = a + h \times \left[\frac{\Sigma f_i u_i}{\Sigma f_i}\right] = 70 + 10\left[\frac{-2}{35}\right]$

$= 70 + \left[\frac{-4}{7}\right] = \frac{486}{7} = 69.4285 = 69.43$ (approx.)

Thus, the mean literacy rate is 69.43%.

EXERCISE - 14.2

1. Mode : Here, the highest frequency is 23.

The frequency 23 corresponds to the class interval 35-45.

$\therefore$ The modal class is 35-45.

Now, class size, $h = 10$, lower limit, $l = 35$

Frequency of the modal class $(f_1) = 23$

Frequency of the class preceding the modal class $(f_0) = 21$

Frequency of the class succeeding the modal class $(f_2) = 14$

$\therefore$ Mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 35 + \left[\frac{23-21}{2\times 23 - 21 - 14}\right]\times 10 = 35 + \left[\frac{2}{46-35}\right]\times 10$

$= 35 + \frac{20}{11} = 35 + 1.8$ (Approx.) $= 36.8$ years (Approx.)

Mean : Let assumed mean, $a = 40$, $h = 10$

Age (in years)	Frequency (f_i)	Class Mark (x_i)	$u_i = \frac{x_i - 40}{10}$	f_iu_i
5 - 15	6	10	–3	–18
15 - 25	11	20	–2	– 22
25 - 35	21	30	–1	– 21
35 - 45	23	40	0	0
45 - 55	14	50	1	14
55 - 65	5	60	2	10
Total	$\Sigma f_i = 80$			$\Sigma f_i u_i = -37$

$\therefore$ Mean, $\bar{x} = a + h \times \left[\frac{\sum f_iu_i}{\Sigma f_i}\right] = 40 + 10\left[\frac{-37}{80}\right]$

$= 40 - \frac{37}{8} = \frac{283}{8} = 35.375$

$\therefore$ Required mean = 35.37 years.

Interpretation : The maximum number of patients admitted in the hospital are of age 36.8 years while the average age of patients is 35.37 years.

2. Here, the highest frequency = 61

$\because$ The frequency 61 corresponds to class 60 – 80.

$\therefore$ The modal class is 60 – 80.

$\therefore$ We have, $l = 60$, $h = 20$, $f_1 = 61$, $f_0 = 52$, $f_2 = 38$.

$\therefore$ Mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 60 + \left[\frac{61-52}{2\times 61 - 52 - 38}\right]\times 20 = 60 + \left[\frac{9}{122-90}\right]\times 20$

$= 60 + \frac{180}{32} = 60 + \frac{45}{8} = 60 + 5.625 = 65.625$ hours.

Thus, the required modal lifetimes of the components is 65.625 hours.

3. Mode :

$\because$ The maximum number of families is 40 having their total monthly expenditure in the interval 1500-2000.

$\therefore$ Modal class is 1500-2000

So, $l = 1500$, $h = 500$, $f_1 = 40$, $f_0 = 24$, $f_2 = 33$

$\therefore$ Mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 1500 + \left[\frac{40-24}{2\times 40 - 24 - 33}\right]\times 500 = 1500 + \left[\frac{16}{80-57}\right]\times 500$

$= 1500 + \frac{8000}{23} = 1500 + 347.83 = 1847.83$

Thus, the required modal monthly expenditure of the families is ₹ 1847.83.

Mean: Let assumed mean (a) = 3250 and class size, $h = 500$

$\therefore$ We have the following table:

Expenditure (in ₹)	Number of families (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 3250}{500}$	f_iu_i
1000 - 1500	24	1250	–4	–96
1500 - 2000	40	1750	–3	–120
2000 - 2500	33	2250	–2	–66
2500 - 3000	28	2750	–1	–28
3000 - 3500	30	3250	0	0
3500 - 4000	22	3750	1	22
4000 - 4500	16	4250	2	32
4500 - 5000	7	4750	3	21
Total	$\Sigma f_i = 200$			$\Sigma f_iu_i = -235$

$\therefore \quad \bar{x} = a + h \times \left[\frac{\sum f_iu_i}{\Sigma f_i}\right] = 3250 + 500 \times \left[\frac{-235}{200}\right]$

$= 3250 - \frac{1175}{2} = 3250 - 587.50 = 2662.5$

Thus, the mean monthly expenditure is ₹ 2662.50.

4. Mode : Since greatest frequency 10 corresponds to class 30-35.

$\therefore$ Modal Class = 30-35 and $h = 5$, $l = 30$, $f_1 = 10$, $f_0 = 9$, $f_2 = 3$

$\therefore$ Mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h = 30 + \left[\frac{10-9}{2\times 10 - 9 - 3}\right]\times 5$

$= 30 + \frac{1}{8}\times 5 = 30 + 0.625 = 30.6$(Approx.)

Mean : Let the assumed mean, $a = 37.5$ and class size, $h = 5$

$\therefore$ We have the following table:

Number of students per teacher	Frequency (f_i)	Class mark (x_i)	$u_i = \frac{x_i - 37.5}{5}$	f_iu_i
15 - 20	3	17.5	– 4	–12
20 - 25	8	22.5	–3	–24
25 - 30	9	27.5	–2	–18
30 - 35	10	32.5	–1	–10
35 - 40	3	37.5	0	0
40 - 45	0	42.5	1	0
45 - 50	0	47.5	2	0
50 - 55	2	52.5	3	6
Total	$\Sigma f_i = 35$			$\Sigma f_iu_i = -58$

$\therefore$ Mean, $\bar{x} = a + h \times \left[\frac{\sum f_iu_i}{\Sigma f_i}\right]$

$= 37.5 + 5 \times \left[\frac{-58}{35}\right] = 37.5 - 8.3 = 29.2.$

Interpretation : The maximum teacher-student ratio is 30.6 while average teacher-student ratio is 29.2.

5. The class 4000-5000 has the highest frequency *i.e.*, 18

$\therefore$ Modal class = 4000-5000

Also, $h = 1000$, $l = 4000$, $f_1 = 18$, $f_0 = 4$, $f_2 = 9$

$\therefore$ Mode $= l + \left[\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 4000 + \left[\dfrac{18-4}{2\times 18 - 4 - 9}\right] \times 1000 = 4000 + 1000\left[\dfrac{14}{23}\right]$

$= 4000 + 608.695 = 4608.7$ (Approx.)

Thus, the required mode is 4608.7.

6. $\because$ The class 40-50 has the maximum frequency *i.e.*, 20

$\therefore$ Modal class = 40-50

$\therefore$ $l = 40, f_1 = 20, f_0 = 12, f_2 = 11$ and $h = 10$.

$\therefore$ Mode $= l + \left[\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 40 + \left[\dfrac{20-12}{2\times 20 - 12 - 11}\right] \times 10 = 40 + 10\left[\dfrac{8}{40-23}\right]$

$= 40 + \dfrac{80}{17} = 40 + 4.7 = 44.7$

Thus, the required mode is 44.7

EXERCISE - 14.3

1. We have the following table :

Monthly Consumption (in units)	Number of Consumers (f_i)	Cumulative Frequency (*c.f.*)
65 - 85	4	4
85 - 105	5	4 + 5 = 9
105 - 125	13	9 + 13 = 22
125 - 145	20	22 + 20 = 42
145 - 165	14	42 + 14 = 56
165 - 185	8	56 + 8 = 64
185 - 205	4	64 + 4 = 68
Total	$\Sigma f_i = 68$	

We have, $n = 68 \Rightarrow \dfrac{n}{2} = \dfrac{68}{2} = 34$

Cumulative frequency just greater than 34 is 42 and corresponding class-interval is 125-145.

$\therefore$ 125-145 is the median class.

So, $l = 125$, *c.f.* = 22, $f = 20$ and $h = 20$

$\therefore$ Median $= l + \left[\dfrac{\frac{n}{2} - c.f.}{f}\right] \times h = 125 + \left[\dfrac{34-22}{20}\right] \times 20$

$= 125 + \dfrac{12}{20} \times 20 = 125 + 12 = 137$ units.

Here, $h = 20$

Class mark (x_i)	f_i	$u_i = \dfrac{x_i - 135}{h}$	$f_i u_i$
75	4	–3	–12
95	5	–2	–10
115	13	–1	–13
135 = a (let)	20	0	0
155	14	1	14
175	8	2	16
195	4	3	12
Total	$\Sigma f_i = 68$		$\Sigma f_i u_i = 7$

$\therefore$ Mean, $\bar{x} = a + h \times \left\{\dfrac{\sum f_i u_i}{\Sigma f_i}\right\}$

$= 135 + 20 \times \dfrac{7}{68} = 135 + 2.05 = 137.05$ units.

Now, we find the mode.

$\because$ Class 125-145 has the highest frequency.

$\therefore$ This is the modal class.

So, $h = 20, l = 125, f_1 = 20, f_0 = 13, f_2 = 14$

$\therefore$ Mode $= l + \left[\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

$= 125 + \left[\dfrac{20-13}{2\times 20 - 13 - 14}\right] \times 20$

$= 125 + \dfrac{140}{13} = 125 + 10.76 = 135.76$ units.

We observe that the three measures are approximately equal.

2. Cumulative frequency table for the given data can be drawn as:

Class-interval	Frequency (f_i)	Cumulative frequency (*c.f.*)
0 - 10	5	5
10 - 20	x	5 + x
20 - 30	20	25 + x
30 - 40	15	40 + x
40 - 50	y	40 + x + y
50 - 60	5	45 + x + y
Total	$\Sigma f_i = 60$	

Since, median = 28.5, which lies in the interval 20-30.

$\therefore$ Median class is 20-30.

So, $l = 20, h = 10, f = 20$, *c.f.* = 5 + x, $n = 60$

$\therefore$ Median $= l + \left[\dfrac{\frac{n}{2} - c.f.}{f}\right] \times h$

$\Rightarrow 28.5 = 20 + \left[\dfrac{30-(5+x)}{20}\right] \times 10 \Rightarrow 28.5 = 20 + \dfrac{25-x}{2}$

$\Rightarrow 57 = 40 + 25 - x \Rightarrow x = 40 + 25 - 57 = 8$ ...(i)

Also, $45 + x + y = 60 \Rightarrow 45 + 8 + y = 60$ (From (i))

$\Rightarrow y = 60 - 45 - 8 = 7$.

Thus, $x = 8, y = 7$

3. The given table is cumulative frequency distribution. We write the frequency distribution as given below :

Class-interval	Cumulative frequency (*c.f.*)	Frequency (f_i)
18 - 20	2	2
20 - 25	6	6 – 2 = 4
25 - 30	24	24 – 6 = 18
30 - 35	45	45 – 24 = 21
35 - 40	78	78 – 45 = 33
40 - 45	89	89 – 78 = 11
45 - 50	92	92 – 89 = 3
50 - 55	98	98 – 92 = 6
55 - 60	100	100 – 98 = 2

We have, $n = 100 \Rightarrow \frac{n}{2} = \frac{100}{2} = 50$

$\because$ The cumulative frequency just greater than 50 is 78.

$\therefore$ The median class is 35 – 40.

Now, l = 35, $c.f.$ = 45, f = 33 and h = 5

$$\therefore \quad \text{Median} = l + \left[\frac{\frac{n}{2} - c.f.}{f}\right] \times h$$

$$= 35 + \left[\frac{50-45}{33}\right] \times 5$$

$$= 35 + \frac{5}{33} \times 5 = 35 + \frac{25}{33} = 35 + 0.76 = 35.76$$

Thus, the median age = 35.76 years.

4. After changing the given table as continuous classes we prepare the cumulative frequency table as follows:

Length (in mm)	Number of leaves (f_i)	Cumulative frequency (c.f.)
117.5 - 126.5	3	3
126.5 - 135.5	5	3 + 5 = 8
135.5 - 144.5	9	8 + 9 = 17
144.5 - 153.5	12	17 + 12 = 29
153.5 - 162.5	5	29 + 5 = 34
162.5 - 171.5	4	34 + 4 = 38
171.5 - 180.5	2	38 + 2 = 40
Total	$\sum f_i$ = 40	

Here, $n = 40 \Rightarrow \frac{n}{2} = \frac{40}{2} = 20$

The cumulative frequency just greater than 20 is 29 and it corresponds to the class 144.5-153.5.

So, 144.5-153.5 is the median class.

We have, l = 144.5, f = 12, $c.f.$ = 17 and h = 9

$$\therefore \quad \text{Median} = l + \left[\frac{\frac{n}{2} - c.f.}{f}\right] \times h = 144.5 + \left[\frac{20-17}{12}\right] \times 9$$

$$= 144.5 + \frac{3}{12} \times 9 = 144.5 + \frac{9}{4} = 144.5 + 2.25 = 146.75.$$

$\therefore$ Median length of leaves = 146.75 mm.

5. To compute the median, let us write the cumulative frequency distribution as given :

Life time (in hours)	Number of lamps (f_i)	Cumulative frequency (c.f.)
1500 - 2000	14	14
2000 - 2500	56	14 + 56 = 70
2500 - 3000	60	70 + 60 = 130
3000 - 3500	86	130 + 86 = 216
3500 - 4000	74	216 + 74 = 290
4000 - 4500	62	290 + 62 = 352
4500 - 5000	48	352 + 48 = 400
Total	$\sum f_i$ = 400	

Here, $n = 400 \Rightarrow \frac{n}{2} = \frac{400}{2} = 200$

Since, the cumulative frequency just greater than 200 is 216 and corresponding interval is 3000 – 3500.

$\therefore$ The median class is 3000-3500 and so, l = 3000, $c.f.$ = 130, f = 86, h = 500

$$\text{Now, median} = l + \left[\frac{\frac{n}{2} - c.f.}{f}\right] \times h = 3000 + \left[\frac{200-130}{86}\right] \times 500$$

$$= 3000 + \frac{70}{86} \times 500 = 3000 + \frac{35000}{86}$$

$$= 3000 + 406.98 = 3406.98$$

Thus, median life = 3406.98 hours.

6. Median : The cumulative frequency distribution table is as follows:

Number of letters	Frequency (f_i)	Cumulative Frequency (c.f.)
1 - 4	6	6
4 - 7	30	6 + 30 = 36
7 - 10	40	36 + 40 = 76
10 - 13	16	76 + 16 = 92
13 - 16	4	92 + 4 = 96
16 - 19	4	96 + 4 = 100
Total	$\sum f_i$ = 100	

Here, $n = 100 \Rightarrow \frac{n}{2} = \frac{100}{2} = 50.$

Since, the cumulative frequency just greater than 50 is 76 and corresponding interval is 7-10.

$\therefore$ The class 7-10 is the median class.

We have, l = 7, $c.f.$ = 36, f = 40 and h = 3

$$\therefore \quad \text{Median} = l + \left[\frac{\frac{n}{2} - c.f.}{f}\right] \times h = 7 + \left[\frac{50-36}{40}\right] \times 3$$

$$= 7 + \frac{14}{40} \times 3 = 7 + \frac{42}{40} = 7 + 1.05 = 8.05$$

Mean : We have, the following table :

Class - intervals	Frequency (f_i)	Class mark (x_i)	f_ix_i
1 - 4	6	2.5	15
4 - 7	30	5.5	165
7 - 10	40	8.5	340
10 - 13	16	11.5	184
13 - 16	4	14.5	58
16 - 19	4	17.5	70
Total	$\sum f_i$ = 100		$\sum f_ix_i$ = 832

$$\therefore \quad \text{Mean, } \bar{x} = \frac{\sum f_ix_i}{\sum f_i} = \frac{832}{100} = 8.32$$

Mode : Since the class 7-10 has the maximum frequency.

$\therefore$ The modal class is 7-10.

So, we have $l = 7, h = 3, f_1 = 40, f_0 = 30, f_2 = 16$

$$\therefore \quad \text{Mode} = l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h = 7 + \left[\frac{40-30}{2 \times 40 - 30 - 16}\right] \times 3$$

$$= 7 + \left(\frac{10}{34}\right) \times 3 = 7 + \frac{30}{34} = 7 + 0.88 = 7.88$$

7. We have cumulative frequency table as follows:

Weight (in kg)	Frequency (f_i)	Cumulative Frequency (c.f.)
40 - 45	2	2
45 - 50	3	2 + 3 = 5
50 - 55	8	5 + 8 = 13
55 - 60	6	13 + 6 = 19
60 - 65	6	19 + 6 = 25
65 - 70	3	25 + 3 = 28
70 - 75	2	28 + 2 = 30
Total	$\sum f_i = 30$	

Here, $n = 30 \Rightarrow \frac{n}{2} = \frac{30}{2} = 15$

The cumulative frequency just greater than 15 is 19, which corresponds to the class 55-60. So, median class is 55-60 and we have $l = 55$, $f = 6$, $c.f. = 13$ and $h = 5$

$$\therefore \quad \text{Median} = l + \left[\frac{\frac{n}{2} - c.f.}{f}\right] \times h$$

$$= 55 + \left[\frac{15-13}{6}\right] \times 5 = 55 + \frac{2}{6} \times 5$$

$$= 55 + \frac{10}{6} = 55 + 1.67 = 56.67$$

Thus, the required median weight of the students = 56.67 kg.