

Cumulative Frequency Distribution

Cumulative frequency corresponds to a specified value of the variable may be defined as the number of observations smaller than (or greater than) that value.

A table showing the cumulative frequencies against values of the variable systematically arranged in an ascending (or descending) order is known as cumulative frequency distribution.

(marks)	(Students)	Cumulative Frequency	
value of x	Frequency	(LESS THAN)	MORE THAN
(0-10)	4	4	125
10-20	12	$4+12=16$	$125-4=121$
20-30	24	$16+24=40$	$121-12=109$
30-40	36	71	89
40-50	20	91	48
50-60	16	107	28
60-70	8	115	12
70-80	5	120	4
$\Sigma f = N = 125$			

Ex:

From the following data, calculate (a) less than and more than cumulative frequencies.

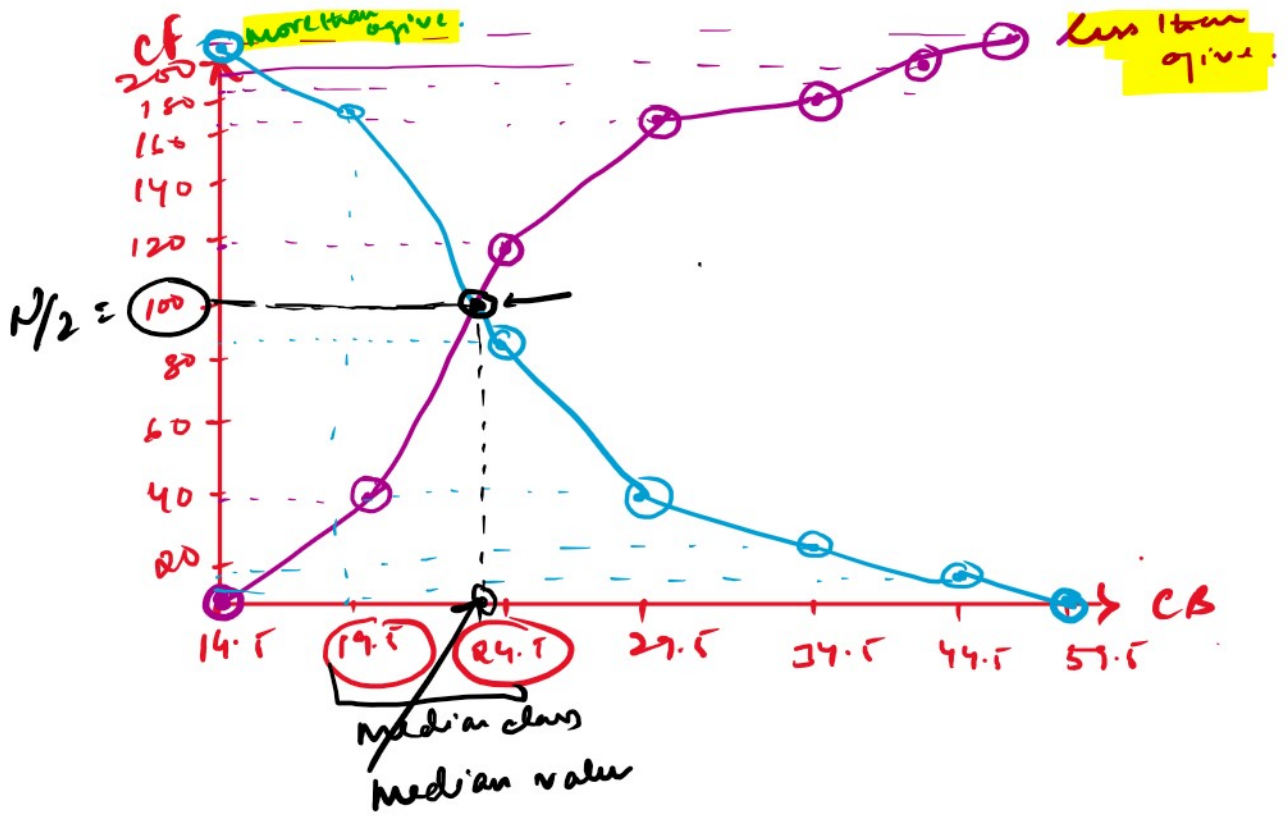
Age (years)	Frequency (f)	Cumulative frequency	
		less	More

Age (years)	Frequency (f)	Cumulative freq	
		less	More
15-19	37	37	200 ✓
20-24	81	118	163 ✓
25-29	43	161	82 ✓
30-34	24	185	39 ✓
35-44	9	194	15 ✓
45-59	6	200 = N	6 ✓
$\Sigma f = 200 = N$			

<u>X-axis</u> Class boundaries	less than	More than
✓ 14.5	0	200 = N
✓ 19.5	37	163
✓ 24.5	118	82
29.5	161	39
34.5	185	15
44.5	194	6
59.5	200 = N	0

Graphical representation of cumulative frequency distribution is Ogive.





(i) By using the method of interpolation

$$\frac{28 - 19.5}{24.5 - 19.5} = \frac{x - 37}{118 - 37}$$

$$x = 93.7 \approx 94$$

(ii)

$$\frac{33 - 29.5}{34.5 - 29.5} = \frac{y - 161}{185 - 161}$$

$$y = 178$$

\therefore No. of people with eye more than 33 = $200 - 178$

(iii) $178 - 94 = 84$ (iii) = (22)

$$(iii) \quad 178 - 94 = 84 \quad \underline{\underline{\text{(ans)}}} = \textcircled{22}$$

Q2

Calculate

(a) number of cars between 112 and 134

(b) number less than 112

(c) number greater than 134

from the following:

Class limit	Frequency	Cumulative Type
90-100	16	16
100-110	22	38
110-120	45	83
120-130	60	143
130-140	50	193
140-150	24	217
150-160	10	227 = N
	$\Sigma f = N = 227$	