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Sub : Computational Statistics and Probability [L]

[Assignment Mid Term]

⊗ I take the information of 7 families and the total number of persons is around 40 and it's given below:

Mon	Divison	Gender	Age	Height	weigth	Educatio	occopation	Covid Inf
1	Rangpur	Female	40	5'2"	65	MSC	Housework	positive
2	Rangpur	Female	19	4'8"	40	BSC	Student	Negative
3	Rangpur	Male	53	5'2"	68	MSC	Job	Negative
4	Rangpur	Male	20	5'1"	47	BSC	Student	Negative
5	Rangpur	Male	36	5'6"	60	MSC	Job	positive
6	Rangpur	Female	17	5'4"	45	BSC	Student	Negative
7	Dhaka	Male	53	5'10"	65	MSC	Job	Negative
8	Dhaka	Male	22	5'1"	50	BSC	Student	Negative
9	Dhaka	Male	23	5'2"	55	BSC	Student	Negative
10	Dhaka	Female	45	5'1"	58	MSC	Housework	positive
11	Dhaka	female	21	5'0"	45	BSC	Student	Negative
12	Rajshahi	Male	55	5'8"	50	MSC	Job	Suspected
13	Rajshahi	Male	25	5'10"	40	BSC	Student	Suspected
14	Rajshahi	Male	20	5'5"	40	BSC	Student	Positive
15	Rajshahi	female	41	5'1"	50	MSC	Job	Positive
16	Rajshahi	female	21	5'2"	52	BSC	Student	Negative
17	Khulna	Male	50	5'10"	53	MSC	Job	Negative
18	Khulna	Male	21	5'2"	40	BSC	Student	Negative

19	Khulna	Male	20	4'8"	50	BSC	Student	Suspected
20	Khulna	Female	35	4'5"	60	MSC	Housewife	Negative
21	Khulna	Male	22	3'8"	45	BSC	Student	Pasitive
22	Sylhet	Male	51	5'10"	55	MSC	Job	Negative
23	Sylhet	Male	25	3'9"	60	BSC	Student	Negative
24	Sylhet	Male	22	4'5"	58	BSC	Student	Suspected
25	Sylhet	Female	39	3'10"	48	MSC	Housewife	Negative
26	Sylhet	Female	21	4'5"	50	BSC	Student	positive
27	Sylhet	Female	20	4'8"	45	BSC	Student	Positive
28	Chittagong	Male	55	5'1"	60	MSC	Job	Negative
29	Chittagong	Male	20	4'6"	55	BSC	Student	Suspected
30	Chittagong	Male	18	4'5"	58	BSC	Student	Suspected
31	Chittagong	Female	38	4'9"	50	MSC	Job	Negative
32	Chittagong	Female	23	4'1"	45	BSC	Student	Negative
33	Chittagong	Female	20	4'2"	40	BSC	Student	Negative
34	Faridpur	Male	58	5'2"	59	MSC	Job	positive
35	Faridpur	Male	20	4'3"	45	BSC	Student	Negative
36	Faridpur	Male	21	5"	48	BSC	Student	Suspected
37	Faridpur	Male	22	5'1"	55	BSC	Student	positive
38	Faridpur	Female	60	4'4"	62	MSC	Housework	Suspected
39	Faridpur	Female	42	5'1"	40	MSC	Job	Negative
40	Faridpur	Female	22	4'9"	41	BSC	Student	Negative

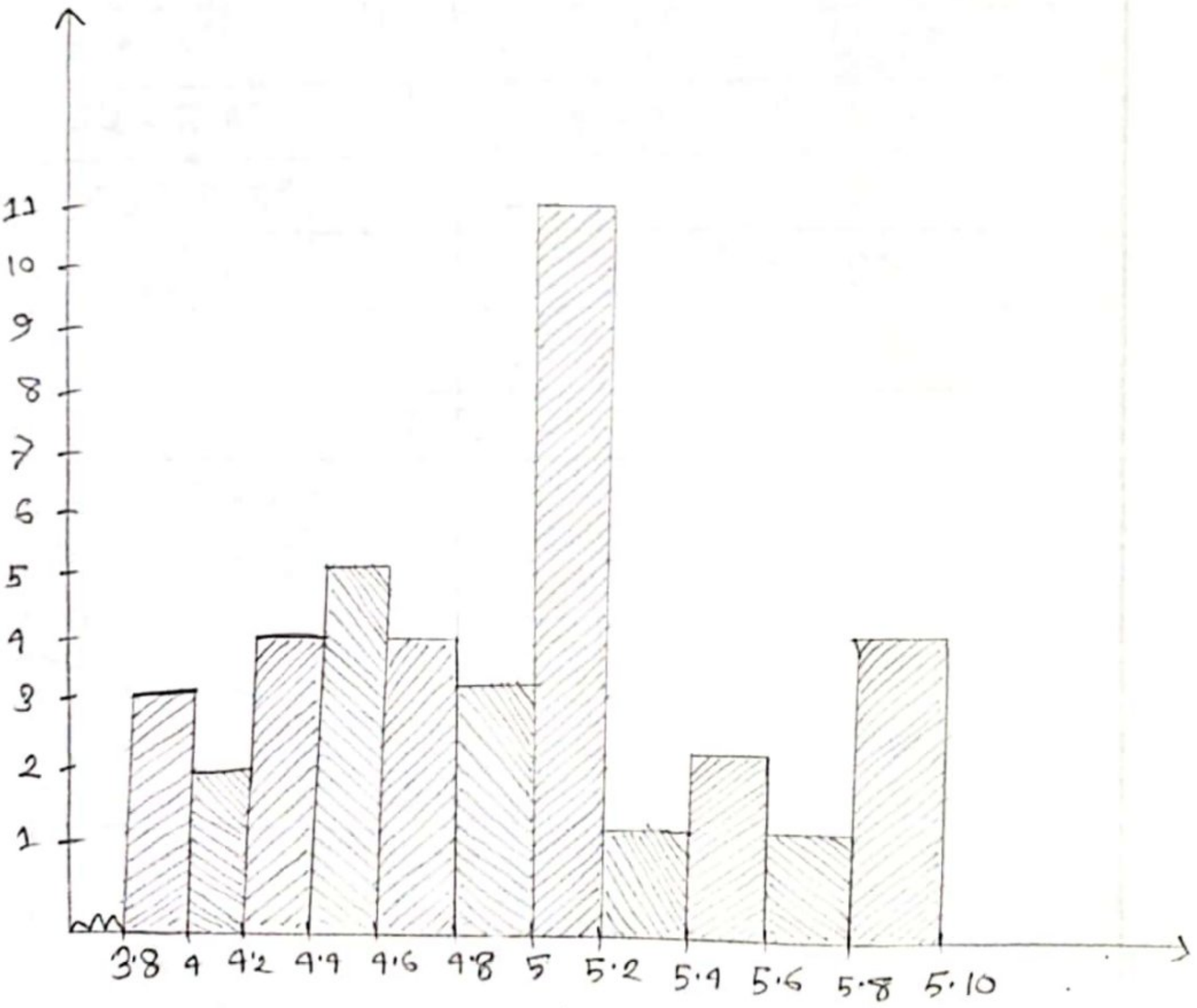
Answer to the question no 1

There are the information of people and construct a height distribution for my neighbors or relatives are given bellow :

Height distribution	Tally	Frequency
3'8" – 4	III	3
4 – 4'2"	II	2
4'2" – 4'4"	IIII	4
4'4" – 4'6"	~~IIII~~	5
4'6" – 4'8"	IIII	4
4'8" – 5	III	3
5 – 5'2	~~IIII~~ ~~III~~ I	11
5'2" – 5'4"	I	1
5'4" – 5'6"	II	2
5'6" – 5'8"	I	1
5'8" – 5'10"	IIII	4
	Total	40

Answer to the question no-2

From 1 no Answer we get the class intervals. Now I am going to draw a histogram and frequency curve. below:

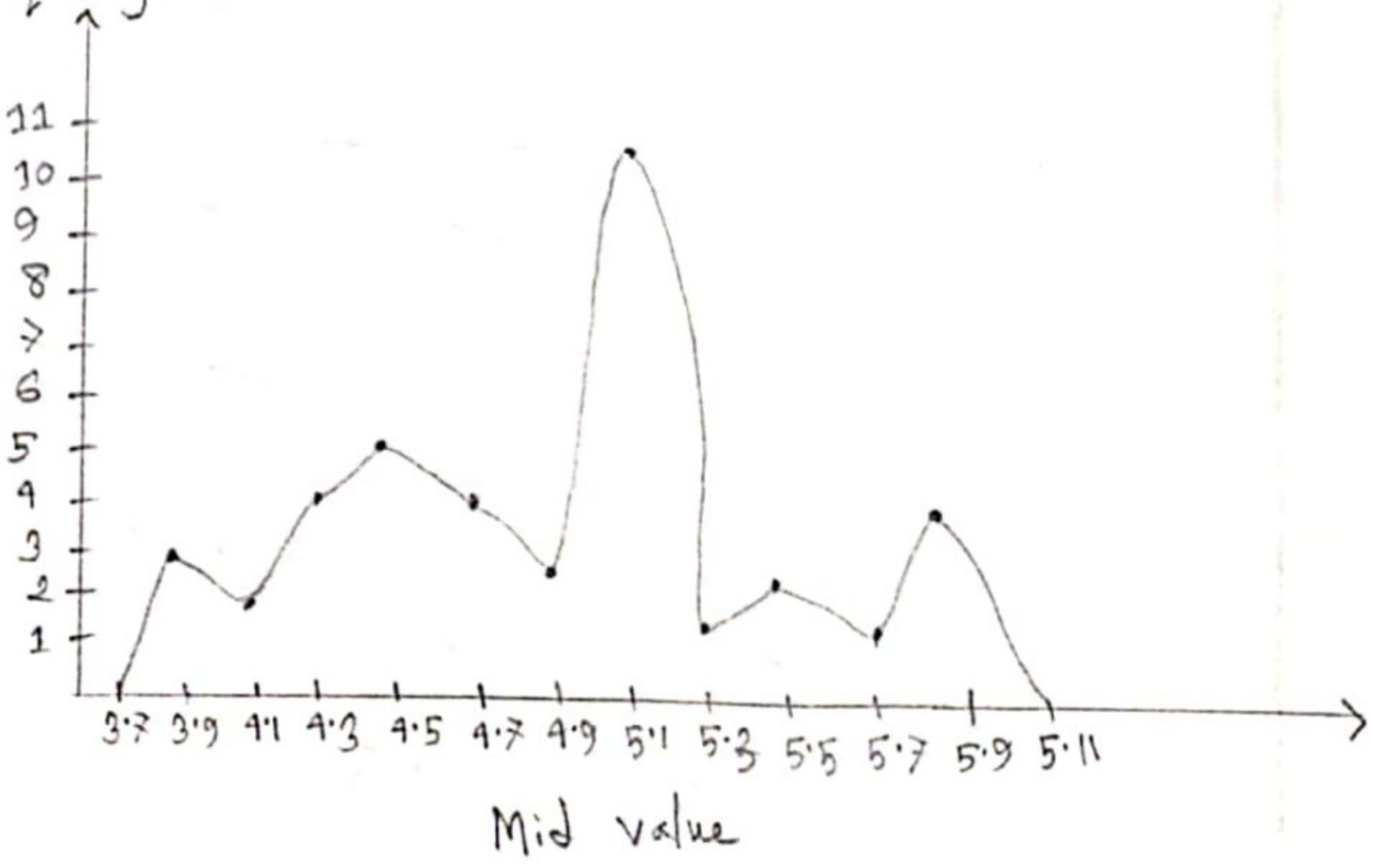


Height distribution

Pic : Histogram

Height distribution	Frequency	Mid value.
3'8" – 4	3	3'9"
4 – 4'2"	2	4'1"
4'2" – 4'4"	4	4'3"
4'4" – 4'6"	5	4'5"
4'6" – 4'8"	4	4'7"
4'8" – 5	3	4'9"
5 – 5'2	11	5'1"
5'2" – 5'4"	1	5'3"
5'4" – 5'6"	2	5'5"
5'6" – 5'8"	1	5'7"
5'8" – 5'10"	4	5'9"
	Total : 40	

Frequency Curve :

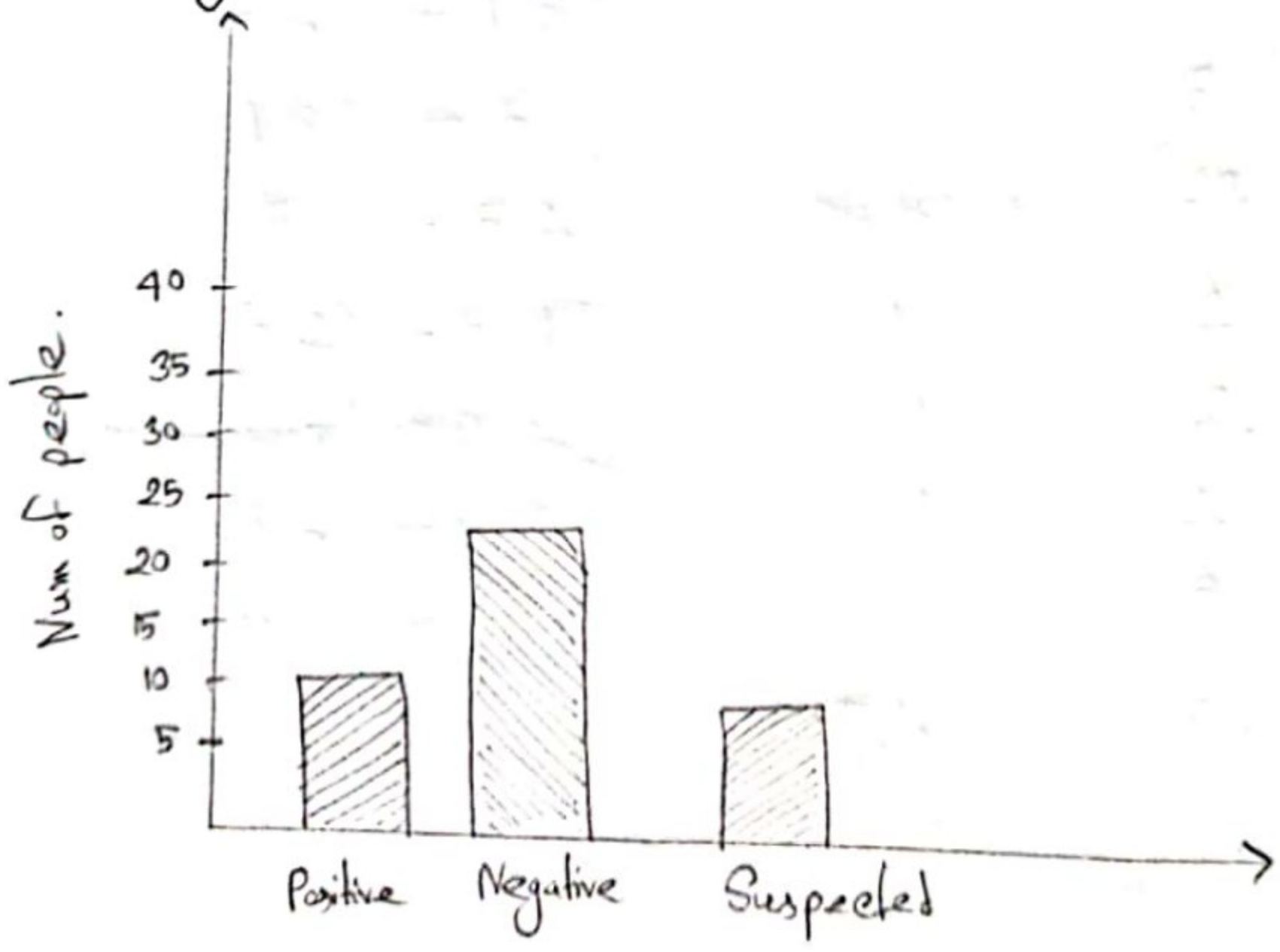


Answer to the question no- 3.

Covid-19 information of my relatives are graphically shown below :

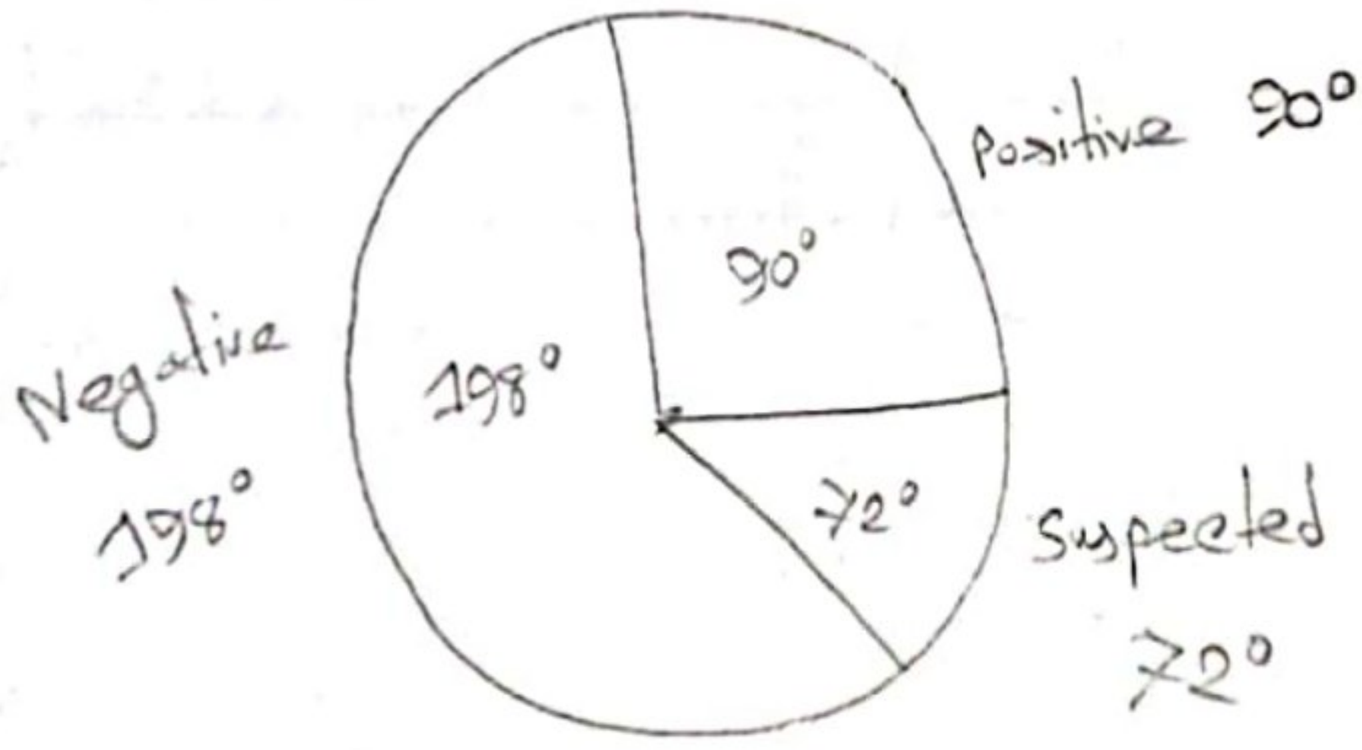
Covid-19 Info	Number of people
Positive	10
Negative	22
Suspected	8
Total	40

Bar diagram.



Pie : Bar diagram

COVID-19 Inf:	Number of People	Angle = $\frac{x \times 360}{Total}$
Positive	10	90°
Negative	22	198°
Suspected	8	72°
Total	40	



Pie diagram.

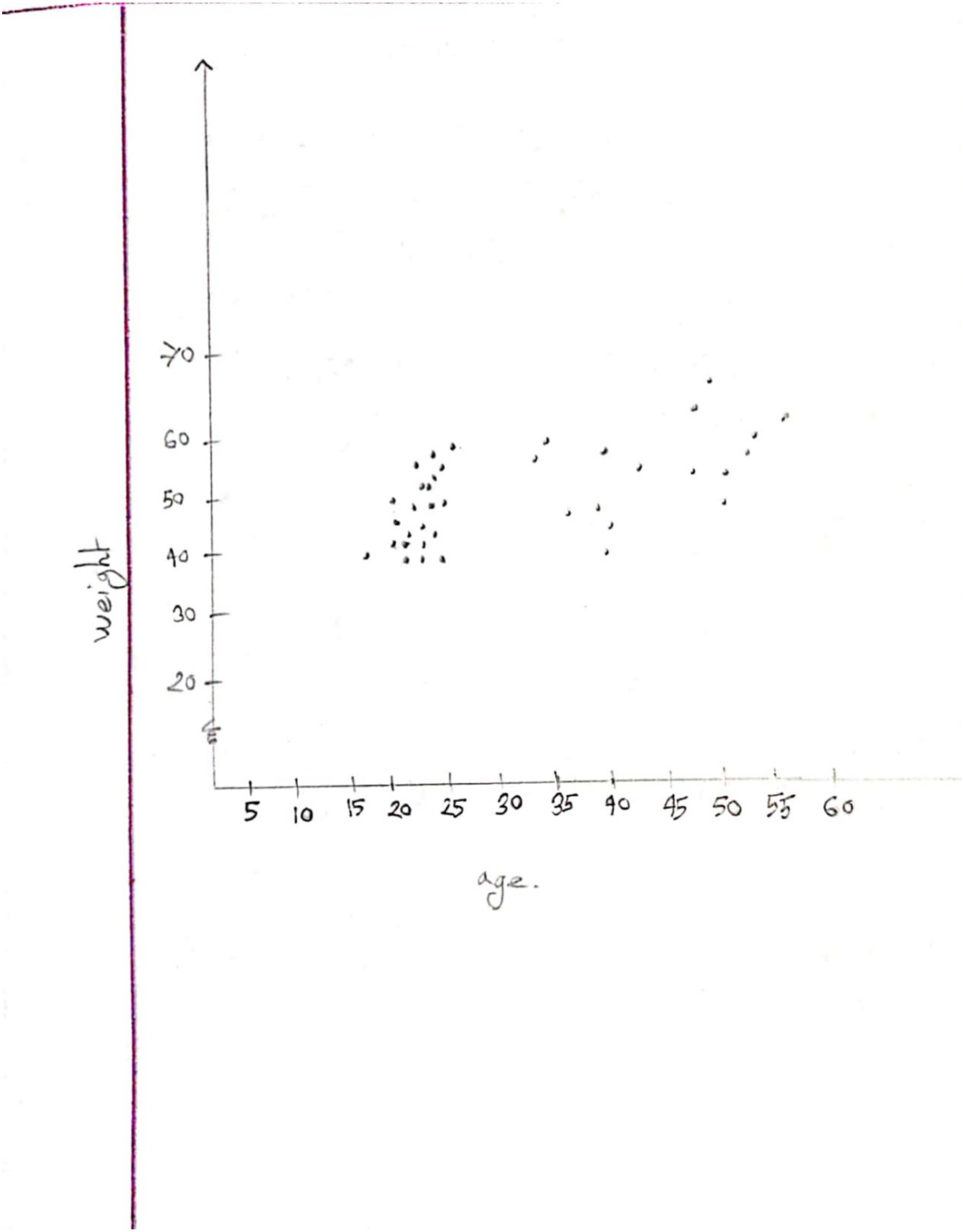
Answer to the question 20-9

Represent the relationship of the weight and Age of my neighbors or relatives are given below:

Age	weight
40	65
19	40
53	68
20	47
36	60
17	45
53	65
22	50
23	55
45	58
21	45
55	50
25	40
20	40
41	50
21	52
50	53
21	40
20	50
35	60
22	45
51	55
25	60

Age	weight
22	58
39	48
21	50
20	45
55	60
20	55
18	58
38	50
23	45
20	40
58	59
20	40
21	48
22	55
60	62
42	40
22	47

(P.T.O)



Answer to the question no-5.

Age : 40, 19, 53, 20, 36, 17, 53, 22, 23, 45, 21, 55, 25, 20, 41, 21, 50, 21, 20, 35, 22, 51, 25, 22, 39, 21, 20, 55, 20, 18, 38, 23, 20, 58, 20, 21, 22, 60, 42, 22

Heigh : 5.2, 4.8, 5.2, 5.1, 5.6, 5.4, 5.10, 5.1, 5.2, 5.1, 5, 5.8, 5.10, 5.5, 5.1, 5.2, 5.10, 5.2, 4.8, 4.5, 3.8, 5.10, 3.9, 4.5, 3.10, 4.5, 4.8, 5.1, 4.6, 4.5, 4.9, 4.1, 4.2, 5.2, 4.3, 5, 5.1, 4.4, 5.1, 4.9

Solution : For ungrouped data.

age : 40, 19, 53, 20, 36, 17, 53, 22, 23, 45, 21, 55, 25, 20, 41, 21, 50, 21, 20, 35, 22, 51, 25, ~~20~~, 22, 39, 21, 20, 55, 20, 18, 38, 23, 20, 58, 20, 21, 22, 60 42, 22.

$$\bar{x} = \frac{40+19+53+20+36+17+53+22+23+45+21+55+25+20+41+21+50+21+20+35+22+51+25+22+39+21+20+55+20+18+38+23+20+58+20+21+22+60+42+22}{40}$$

$$= 31.4$$

$$\sigma^2 = \frac{\Sigma(x_i - \bar{x})^2}{n}$$

$$= \frac{(40-31.4)^2 + (19-31.4)^2 + (53-31.4)^2 + (20-31.4)^2 + (36-31.4)^2 + (17-31.4)^2 + (53-31.4)^2 + (22-31.4)^2 + (23-31.4)^2 + (45-31.4)^2 + (21-31.4)^2 + (55-31.4)^2 + (25-31.4)^2 + (20-31.4)^2 + (41-31.4)^2 + (21-31.4)^2 + (50-31.4)^2 + (21-31.4)^2 + (26-31.4)^2 + (35-31.4)^2 + (22-31.4)^2 + (51-31.4)^2 + (25-31.4)^2 + (39-31.4)^2 + (21-31.4)^2 + (20-31.4)^2 + (55-31.4)^2 + (20-31.4)^2 + (18-31.4)^2 + (38-31.4)^2 + (23-31.4)^2 + (20-31.4)^2 + (58-31.4)^2 + (20-31.4)^2 + (21-31.4)^2 + (22-31.4)^2 + (60-31.4)^2 + (42-31.4)^2 + (22-31.4)^2 + (22-31.4)^2}{40}$$

$$= 188.94$$

$$SD = \sqrt{188.94} = 13.7455$$

$$CV = \frac{SD \times 100}{\bar{x}} = \frac{13.7455 \times 100}{31.4}$$

$$= 43.775\ \%$$

Height : 5·2, 4·8, 5·2, 5·1, 5·6, 5·4, 5·10, 5·1,
5·2, 5·1, 5, 5·8, 5·10, 5·5, 5·1, 5·2, 5·10, 5·2,
4·8, 4·5, 3·8, 5·10, 3·9, 4·5, 3·10, 4·5,
4·8, 5·1, 4·6, 4·5, 4·9, 4·1, 4·2, 5·2,
4·3, 5, 5·1, 4·9, 5·1, 4·9

$$\bar{x} = \frac{5·2+4·8+5·2+5·1+5·6+5·4+5·10+5·1+5·2+5·1+5+5·8+5·10+5·5+5·1+5·2+5·10+5·2+4·8+4·5+3·8+5·10+3·9+4·5+3·10+4·5+4·8+5·1+4·6+4·5+4·9+4·1+4·2+5·2+4·3+5+5·1+4·9+5·1+4·9}{40}$$

$$\therefore = 4·85$$

$$\sigma = \frac{\Sigma(x_i - \bar{x})^2}{n}$$

(P.T.O)

$$
\frac{\begin{aligned}
&(5.2-4.85)^2+(4.8-4.85)^2+(5.2-4.85)^2 \\
&+(5.1-4.85)^2+(5.6-4.85)^2+(5.4-4.85)^2+(5.10-4.85)^2 \\
&+(5.1-4.85)^2+(5.2-4.85)^2+(5.1-4.85)^2+(5-4.85)^2 \\
&+(5.8-4.85)^2+(5.10-4.85)^2+(5.5-4.85)^2+(5.1-4.85)^2 \\
&+(5.2-4.85)^2+(5.10-4.85)^2+(5.2-4.85)^2+(4.8-4.85)^2 \\
&+(4.5-4.85)^2+(3.8-4.85)^2+(5.10-4.85)^2+(3.9-4.85)^2 \\
&+(4.5-4.85)^2+(3.10-4.85)^2+(4.5-4.85)^2+(4.8-4.85)^2 \\
&+(5.1-4.85)^2+(4.6-4.85)^2+(4.5-4.85)^2 \\
&+(4.9-4.85)^2+(4.1-4.85)^2+(4.2-4.85)^2+(5.2-4.85)^2 \\
&+(4.3-4.85)^2+(5-4.85)^2+(5.1-4.85)^2+(4.4-4.85)^2 \\
&+(5.1-4.85)^2+(4.9-4.85)^2
\end{aligned}}{40}
$$

$$= 0.2694$$

$$SD = \sqrt{0.2694} = 0.5190$$

$$CV = \frac{SD \times 100}{\bar{x}} = \frac{0.5190 \times 100}{4.85}$$

$$= 10.70\%$$

Scanned with CamScanner

From result we said that age variable has more variability.