

IFEOLUWA PROMISE

19/ENG02/021

COMPUTER ENGINEERING

STATISTICS ASSIGNMENT

① A study of yellow fever diseases (YFA) was conducted. The study was restricted to patients under the age of 40. One purpose was to compare the distribution of cases by age in group A to that of group B. The group data are given below.

C.I	Group A	Group B
1-5	0	2
6-10	7	4
11-15	10	7
16-20	2	20
21-25	1	16
26-30	5	10
31-35	4	4

Calculate

i. The mean and standard deviation for each group.

ii. The Coefficient of variation for each group.

iii. Which group has less variable distribution

Ans. GROUP A.

C.I	f	Midpoint (x)	fx	(x - \bar{x})	(x - \bar{x}) ²	f(x - \bar{x}) ²
1-5	0	3	0	14	196	0
6-10	7	8	56	9	81	567
11-15	10	13	130	4	16	160
16-20	2	18	36	1	1	2
21-25	1	23	23	6	36	36
26-30	5	28	140	11	121	605
31-35	4	33	132	16	256	1024
	29		497			2394

$$(\bar{x}) \text{ Mean} = \frac{\sum fx}{\sum f} = \frac{497}{29} = 17.13 \approx 17$$

Standard deviation = $\sqrt{\text{Variance}}$

$$\text{Variance} = \frac{\sum f(x-\bar{x})^2}{\sum f} = \frac{2394}{29} = 82.55$$

$$\text{Standard deviation} = \sqrt{82.55} = 9.085 \approx 9.1$$

1b. Group B

C.I	f	Mid point (x)	fx	x-x̄	(x-x̄) ²	f(x-x̄) ²
1-5	2	3	6	.17	289	578
6-10	4	8	32	12	144	576
11-15	7	13	91	7	49	343
16-20	20	18	360	2	4	80
21-25	16	23	368	3	9	144
26-30	10	28	280	8	64	640
31-35	4	33	132	13	169	676
	<u>63</u>		<u>1269</u>			<u>3037</u>

$$\text{Mean}(\bar{x}) = \frac{\sum fx}{\sum f} = \frac{1269}{63} = 20.14 \approx 20$$

Standard deviation = $\sqrt{\text{Variance}}$

$$\text{Variance} = \frac{\sum f(x-\bar{x})^2}{\sum f} = \frac{3037}{63} = 48.21$$

$$\text{Standard deviation} = \sqrt{48.21} = 6.94 \approx 6.9$$

ii. Group A

$$\text{C.V} = \frac{\text{Standard deviation}}{\text{mean}} \times 100 = \frac{9.1}{17} \times 100 = 53.52$$

$$\therefore \text{C.V} \approx 53.5$$

Group B

$$\text{C.V} = \frac{\text{Standard deviation}}{\text{mean}} \times 100 = \frac{6.9}{20} \times 100 = 34.5$$

$$\therefore \text{C.V} \approx 34.5$$

∴ The group with the less variable distribution is group B