

Frafanul Haq

ID = 17-35338-3

See: O

Roll	x	\bar{x}	$ x - \bar{x} $	$(x - \bar{x})^2$
1	23		1.4	1.96
2	22		0.4	0.16
3	21		-0.6	0.36
4	22		0.4	0.16
5	21		-0.6	0.36
6	20	$324/15$ $= 21.6$	0.4	2.56
7	21		-0.6	0.36
8	21		-0.6	0.36
9	22		0.4	0.16
10	22		0.4	0.16
11	22		0.4	0.16
12	22		0.4	0.16
13	22		-0.6	0.36
14	22		0.4	0.16
15	22		0.4	0.16

$$\text{Total} = 324$$

$$2.2$$

$$7.6$$

$$\text{Mean deviation} = \frac{2.2}{15} = 0.1467$$

$$\therefore SD = \sqrt{\text{variance}}$$

$$\text{variance} = \frac{7.6}{15} = 0.5067$$

$$= \sqrt{0.5067}$$

$$= 0.718$$

$$CV = \frac{0.718}{21.6} \times 100\% = 3.2954\%$$

18-36264-1

Roll: 3

Sec: 0

Roll	x	\bar{x}	$x - \bar{x}$	$ x - \bar{x} $	$(x - \bar{x})^2$
1	23	$\frac{324-15}{216} = 21.6$		1.4	1.96
2	22	21.6	-0.4	0.4	0.16
3	21	21.6	-0.6	0.6	0.36
4	22	21.6	0.4	0.4	0.16
5	21	21.6	-0.6	0.6	0.36
6	20	21.6	0.4	0.4	0.16
7	21	21.6	-0.6	0.6	0.36
8	21	21.6	-0.6	0.6	0.36
9	22	21.6	0.4	0.4	0.16
10	22	21.6	0.4	0.4	0.16
11	22	21.6	0.4	0.4	0.16
12	22	21.6	0.4	0.4	0.16
13	21	21.6	-0.6	0.6	0.36
14	22	21.6	0.4	0.4	0.16
15	22	21.6	0.4	0.4	0.16

Total 324

$$\therefore \text{DMO} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{7.2}{15} = 0.6833$$

$$\therefore \sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15} = 0.506$$

20.51

$$\therefore CV_2 = \frac{0.718}{21.6} \times 100\% = 3.2954\%$$

C8SP [O]

Assignment 2

Khan, Moshirur Rahman
18-36303-1

Roll (n)	age (x)	$\bar{x} (\approx \frac{\sum x}{n})$	$x - \bar{x}$	$(x - \bar{x})^2$
1	23	$\frac{324}{15} = 21.6$		
2	22			
3	21			
4	22	$23 - 21.6 = 1.4$	1.96	
5	21		0.4	0.16
6	20		-0.6	0.36
7	21		0.4	0.16
8	22		-0.6	0.36
9	22		0.4	0.16
10	22		-0.6	0.36
11	22		0.4	0.16
12	22		0.4	0.16
13	21		0.4	0.16
14	22		-0.6	0.36
15	22		0.4	0.16
		<u>324</u>	0.4	

$$MD = \frac{q_2 - q_1}{15} = 0.613$$

$$\sigma^2 = \frac{\sum (x - \bar{x})^2}{15} = 0.507$$

$$SD = \sqrt{0.507} = 0.712$$

$$CV = \frac{0.712}{21.6} \times 100 = 3.2967\%$$

① a) Arithmetic Mean = $\frac{324}{15} = 21.6$

⑤ b) Geometric mean = $\sqrt[15]{7650720} = 2.887$

c) Harmonic mean = $\frac{n}{\frac{1}{\sum \frac{1}{x_i}}} = 21.644$

② Median = $\frac{15+1}{2} = 8$
age = 22

③ Mode = 22

ID: 19-41241-2

Name: Zubair Chowdhury

Serial: 20

Subject: Computational
Statistics

Assignment: 2

23, 22, 21, 22, 21, 20, 21, 21, 22, 22, 22, 22
22, 21, 22, 22

$$A.M = \frac{324}{15}$$

$$= 21.6$$

$$\sigma M = (\overline{x})^{\frac{1}{2}} \cdot (S^2)^{\frac{1}{2}}$$
$$= \cancel{21.6} \quad 20.26$$

$$H.M = \frac{15}{\left(\frac{1}{23} + \frac{1}{22} + \frac{1}{21} + \frac{1}{22} + \frac{1}{21} + \frac{1}{20} + \frac{1}{21} + \frac{1}{21} + \frac{1}{20} + \frac{1}{22} + \frac{1}{22} + \frac{1}{21}\right)}$$
$$+ \frac{1}{22} + \frac{1}{22} + \frac{1}{22} + \frac{1}{22} + \frac{1}{21} + \frac{1}{21} + \frac{1}{22} + \frac{1}{22}$$
$$= 14.11$$

Mode is 22

Median is 22

∅

zubair choudhury

19-41241-2

Roll	X	\bar{X}	$X - \bar{X}$	$ X - \bar{X} $	$(X - \bar{X})^2$
1	23	$\frac{324}{15} = 21.6$	$23 - 21.6 = 1.4$	1.4	1.96
2	22	21.6	0.4	0.4	0.16
3	21	21.6	-0.6	0.6	0.36
4	22	21.6	0.4	0.4	0.16
5	21	21.6	-0.6	0.6	0.36
6	20	21.6	-0.4	0.4	0.36
7	21	21.6	-0.6	0.6	0.36
8	21	21.6	-0.6	0.6	0.36
9	22	21.6	0.4	0.4	0.36
10	22	21.6	0.4	0.4	0.16
11	22	21.6	0.4	0.4	0.16
12	22	21.6	0.4	0.4	0.16
13	21	21.6	-0.6	0.6	0.16
14	22	21.6	0.4	0.4	0.36
15	2	21.6	0.4	0.4	0.16
Total(n) = 324					

$$MD = \frac{1}{n} \sum_{i=1}^n |X_i - \bar{X}| = \frac{9.2}{15} = 0.6133$$

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})^2 = \frac{7.6}{15} = 0.5067$$

$$SD = \sigma = \sqrt{\text{variance}} = \sqrt{0.5067} = 0.7118$$

$$CV = \frac{0.7118}{21.6} \times 100\% = 3.2954$$

Assignment # 02

Name: Joy Matubber

ID: 20-41959-1

Section: - 0

Serial: - 07

The data set of age is given as,

$$A = 23, 22, 21, 22, 21, 20, 21, 21, 22, 23, 22, 21 \\ \text{so, } n = 15.$$

Arithmetic mean:-

$$AM = \frac{\sum A_i}{n} = \frac{324}{15} = 21.60$$

Geometric mean:-

$$GM = \sqrt[n]{(23 \times 22 \times 21 \times 22 \times 21 \times 20 \times 21 \times 21 \times 22 \times 23 \times 22 \times 22 \times 22 \times 22 \times 22)} \\ = 21.58$$

Harmonic mean:-

$$HM = \frac{n}{\frac{1}{A_1} + \frac{1}{A_2} + \dots + \frac{1}{A_n}} = \frac{15}{\frac{1}{23} + \frac{1}{22} + \frac{1}{21} + \frac{1}{22} + \frac{1}{21} + \frac{1}{20} + \frac{1}{21} + \frac{1}{21} + \frac{1}{22} + \frac{1}{21} + \frac{1}{21} + \frac{1}{22} + \frac{1}{22} + \frac{1}{22} + \frac{1}{21}}$$

$$\therefore HM = \frac{15}{0.6953}$$

$$= 21.57$$

Median:- for Ascending Order our Data set we get,

$$A = 20, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 22, 22, 22, 23$$

so, Median = 22.

Mode: In our data set we see that the Maximum number of time we get the Age is 22.

$$\text{So, Mode} = 22$$

$$F_0 = 7 / 15 \approx 0.4667$$

Dispersion

Serial	Age	Age	Age _i - Age	Age _i - Age	(Age _i - Age) ²
1	23		-1.4	1.4	1.96
2	22		0.4	0.4	0.16
3	21		-0.6	0.6	0.36
4	22		0.4	0.4	0.16
5	21		-0.6	0.6	0.36
6	20	= 324 / 15	1.6	1.6	2.56
7	21		-0.6	0.6	0.36
8	21	= 21.6	-0.6	0.6	0.36
9	22		0.4	0.4	0.16
10	22		0.4	0.4	0.16
11	22		0.4	0.4	0.16
12	22		0.4	0.4	0.16
13	21		-0.6	0.6	0.36
14	22		0.4	0.4	0.16
15	22		0.4	0.4	0.16
Total	324			9.2	7.6

① Mean Deviation:

$$MD = \frac{1}{n} \sum_{i=1}^n |Age_i - \bar{Age}|$$

$$= \frac{9.2}{15} = 0.6133$$

② Variance:

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (Age_i - \bar{Age})^2$$

$$= \frac{7.6}{15} = 0.5067$$

③ Standard deviation:-

$$SD = \sigma = \sqrt{0.5067}$$

$$= 0.7118$$

④ Coefficient of Variation:-

$$CV = \frac{\sigma}{\bar{Age}} \times 100\% = \frac{0.7118}{21.6} \times 100\%$$

$$= 3.29\%$$

Name: Jawad Mohammed

ID = 20-Q2006-1

Serial: 08

Age: 23, 22, 21, 22, 21, 20, 21, 21, 22, 22, 22, 22, 21, 22, 22

$$\sum \text{Age} = 324$$

$$n = 15$$

Arithmetic Mean

$$\text{AME} = \frac{\sum N}{n} = \frac{324}{15} = 21.6$$

Geometric mean:

$$\text{G.M} = (\text{A.M})^{\frac{1}{n}} = ((23 \times 22 \times 21 \times 22 \times 21 \times 20 \times 21 \times 21 \times 22 \times 22) \times 22 \times 22)^{\frac{1}{15}}$$

$$= (1.03 \times 10^{20})^{\frac{1}{15}}$$

$$= 21.58$$

Harmonic mean: $\frac{n}{\sum \frac{1}{x_i}}$

$$\therefore \frac{1}{\sum \frac{1}{x_i}} = \frac{79873}{106260}$$

$$= \frac{n}{\sum \frac{1}{x_i}} = \frac{15}{\frac{79873}{106260}} = 21.58$$

Median: 20, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 23

$$\text{Median} = 22$$

Mode:

$$\text{Mode} = 22$$

II

		\bar{x}	\bar{x}	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
1	17-35338-3	23	21.6	1.4	1.96
2	18-36264-1	22	21.6	0.4	0.16
3	19-410291-2	22	21.6	0.4	0.16
4	20-41259-1	21	21.6	-0.6	0.36
5	20-42006-1	20	21.6	-1.6	0.36
6	20-42092-1	21	21.6	-0.6	0.36
7	20-42102-1	21	21.6	-0.6	0.36
8	20-42439-1	22	21.6	0.4	0.36
9	20-42459-1	22	21.6	0.4	0.16
10	20-42079-1	22	21.6	0.4	0.16
11	18-363031	21	21.6	-0.6	0.36
12	20-42288-1	22	21.6	0.4	0.16
13	20-42622-4	21	21.6	-0.6	0.36
14	20-42668-1	22	21.6	0.4	0.16
15	20-42669-1	22	21.6	0.4	0.16
+	Total	324		7.2	7.6

Mean deviation:

$$MD: \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{7.2}{15} = 0.613$$

Variance:

$$s^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15} = 0.51$$

standard deviation:

$$SD = \sqrt{\text{variance}} = \sqrt{0.51} \quad \cancel{= 0.783}$$

$$\cancel{= 0.719}$$

coefficient of variation:

$$CV = \frac{s}{\bar{x}} \times 100\% = \frac{0.719}{21.6} \times 100\%$$

$$= \frac{0.719}{21.6} \times 100\% = 3.36\%$$

$$= 3.30\%$$

Abu Tahere Mohim Sarkari, ID: 20-42042-1

- E1 Age \Rightarrow 23, 22, 21, 22, 21, 20, 21, 21, 22.

S (K-14) 22, 22, 22, 21, 22, 22 1132

ΔE	P.L.	P.M.	52	41
41.0	P.O	P.M	89	9

Measure of Central Tendency

~~J.L.O~~ P.O ~~P.O~~ ~~J.O~~

$$(a) \text{ Arithmetic mean} = \frac{324}{15} = 21.60$$

$$(b) \text{ Geometric mean} = \left(1.031 \times 10^{20} \right)^{\frac{1}{15}}$$

3L.O P.O P.O \approx 21.588.

$$\text{Q) Harmonic mean} = \frac{15}{0.6952}$$

$$\begin{array}{ccc} \text{JL.O} & \text{P.O} & \text{P.O} \\ \hline \text{JL.O} & \text{P.O} & \text{P.O} \end{array} = 2\overset{22}{1}.\overset{57}{57}62 \quad \begin{array}{c} \text{ST} \\ \text{10} \\ \text{TA} \end{array}$$

2. Median \Rightarrow Sorted age = 20, 21, 21, 21,
21, 21, 22, 22, 22, 22, 22, 22, 22, 22, 23.

The median value is 22.

3. Mode \Rightarrow The most often used number

Step 3 - Is 22. It's been used a total of eight times. So, Mode is 22.

Dispersion

Roll	Age (x_i)	Average (\bar{x})	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
1	23		1.4	1.4	1.96
2	22		0.4	0.4	0.16
3	21		-0.6	0.6	0.36
4	22		0.4	0.4	0.16
5	21		-0.6	0.6	0.36
6	20		-1.6	1.6	2.56
7	21	21.6	-0.6	0.6	0.36
8	21	21.6	-0.6	0.6	0.36
9	22	21.6	0.4	0.4	0.16
10	22	21.6	0.4	0.4	0.16
11	22	21.6	0.4	0.4	0.16
12	22	21.6	0.4	0.4	0.16
13	21	21.6	-0.6	0.6	0.36
14	22	21.6	0.4	0.4	0.16
15	22	21.6	0.4	0.4	0.16
Total	324		9.2	10	7.6

$$\text{Mean deviation} = \frac{9.2}{15} = 0.6133$$

[$n=15$]

$$\text{Variance}, S^2 = \frac{7.6}{15} = 0.5067$$

$$\text{Standard deviation}, S = \sqrt{0.5067} = 0.7118$$

$$\text{Coefficient of variation} = \frac{0.7118}{21.6} \times 100\% = 3.2954\%$$

[Ans]

* Age \rightarrow 23, 22, 25, 22, 21, 20, 21, 21, 22, 22, 22, 22, 21, 22, 22.

Measure of Central Tendency

1. Mean \rightarrow

a) Arithmetic mean $= \frac{324}{15} = 25.6$

b) Geometric mean $= (1.031 \times 16^{20})^{\frac{1}{15}}$

c) Harmonic mean $= \frac{15}{0.6952} = 21.588$

Median method $= \frac{0.62 + 0.6952}{2} = 0.6586$

2) Median \rightarrow Sorted age = 20, 21, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 22, 23

The median value is 22.

3) Mode \rightarrow the most often used number is 22. It's been used eight times. So Mode is 22.

Dispersion

Roll	Age (x_i)	Average (\bar{x})	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
1	23		1.4	1.4	1.96
2	22		0.4	0.4	0.16
3	21		-0.6	0.6	0.36
4	22		0.4	0.4	0.16
5	21	24/15	-0.6	0.6	0.36
6	20	=21.6	-1.6	1.6	2.56
7	21		-0.6	0.6	0.36
8	21		-0.6	0.6	0.36
9	22		0.4	0.4	0.16
10	22		0.4	0.4	0.16
11	22		0.4	0.4	0.16
12	22		0.4	0.4	0.16
13	21		-0.6	0.6	0.36
14	22		0.4	0.4	0.16
15	22		0.4	0.4	0.16
Total			9.2		2.6

$$\text{Mean deviation} = \frac{9.2}{15} = 0.6133$$

$$\text{Variance } \sigma^2 = \frac{2.6}{15} \quad [\because n=15]$$

$$\text{Standard deviation } \sigma = \sqrt{\frac{2.6}{15}} = 0.5067$$

$$\text{Coefficient of variation} = \frac{0.5067}{21.6} \times 100\% = 3.2954\%$$

Name : Md. Altabur Rahman
ID : 20 - 92107 - 1

Assignment : 2

1. Mean of Ages :

✳ Arithmetic mean :

$$\frac{\sum x}{n} = \frac{324}{15}$$
$$= 21.6$$

✳ Geometric mean :

$$(\pi x)^{\frac{1}{n}}$$
$$= (\pi x)^{\frac{1}{15}}$$
$$= 21.59$$

✳ Harmonic mean :

$$\frac{n}{\sum \frac{1}{x}}$$
$$= 21.57$$

④ Median of ages : 20, 21, 22, 23

$$\text{median} = \frac{21+22}{2} \\ = 21.5$$

⑤ Mode of ages :

23, 22, 21, 22, 21, 20, 21, 21, 22, 22, 22, 22, 21,
22, 22.

$$\text{mode} = 22$$

Roll	x	\bar{x}	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
1	23		$23 - 21.6 = 1.4$	1.4	1.96
2	22		$22 - 21.6 = 0.4$	0.4	0.16
3	21		$21 - 21.6 = -0.6$	0.6	0.36
4	22		$22 - 21.6 = 0.4$	0.4	0.16
5	21		$21 - 21.6 = -0.6$	0.6	0.36
6	20		$20 - 21.6 = -1.6$	1.6	2.56
7	21	$\frac{324}{15} = 21.6$	$21 - 21.6 = -0.6$	0.6	0.36
8	21		$21 - 21.6 = -0.6$	0.6	0.36
9	22		$22 - 21.6 = 0.4$	0.4	0.16
10	22		$22 - 21.6 = 0.4$	0.4	0.16
11	22		$22 - 21.6 = 0.4$	0.4	0.16
12	22		$22 - 21.6 = 0.4$	0.4	0.16
13	21		$21 - 21.6 = -0.6$	0.6	0.36
14	22		$22 - 21.6 = 0.4$	0.4	0.16
15	22		$22 - 21.6 = 0.4$	0.4	0.16
$Total = 324$				$Total = 9.2$	$Total = 7.6$

⊕ Mean deviation:

$$\frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}|$$

$$= \frac{9.2}{15}$$

$$= 0.613$$

⊗ Variance:

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2$$

$$= \frac{7.6}{15}$$

$$= 0.50$$

⊕ Standard deviation:

$$\sigma = \sqrt{\text{Variance}}$$

$$= \sqrt{0.5}$$

$$= 0.7$$

⊗ Coefficient of variation:

$$\frac{0.7}{21.6} \times 100\%$$

$$= \cancel{7\%} 3.29\%$$

Assignment - 2

Name: Moon, Md, Mamunur Rahman

ID: 20-42439-1

(1) Measure of central tendency (For Age)

(i) Mean:

(a) Arithmetic mean:

$$AM = \bar{x} = \frac{\sum_{i=1}^n x_i}{n} = \frac{324}{16} = 20.25$$

(b) Geometric mean:

$$\bar{x}_G = \left(\prod_{i=1}^n x_i \right)^{\frac{1}{n}} = (1.03 \times 10^{20})^{\frac{1}{16}} = 17.82$$

(c) Harmonic mean:

$$\bar{x}_H = \frac{n}{\sum_{i=1}^n \frac{1}{x_i}} = \frac{16}{0.69} = 23.19$$

(ii) Median:

20, 21, 22, 23

$$\therefore Me = \frac{21 + 22}{2} = 21.5$$

Mode:

From the table the most frequent age is 22
So, Mode = 22

(2) Measure of dispersion: (For Age)

(a) Mean Deviation:

$$MD = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}|$$

$$= \frac{1}{16} |324 -$$

$$= \frac{1}{16} \times |23 - 20.25| + |20 - 20.25| + |21 - 20.25|$$

$$= \frac{|23 - 20.25| + |22 - 20.25| + |21 - 20.25| + |22 - 20.25|}{16}$$

$$+ \frac{|21 - 20.25| + |20 - 20.25| + |21 - 20.25| + |21 - 20.25|}{16}$$

$$\frac{|22 - 20.25| + |22 - 20.25| + |22 - 20.25| + |22 - 20.25|}{16}$$

$$\frac{|21-20.25| + |22-20.25| + |22-20.25|}{16}$$

$$= \frac{2.75 + 1.75 + 0.75 + 1.75 + 0.75 + 0.25 + 0.75 + 0.75}{16}$$

$$= \frac{0.75 + 1.75 + 1.75 + 1.75 + 1.75 + 1.75 + 1.75}{16}$$

$$= \frac{20.75}{16}$$

$$= 1.29 (\text{MD})$$

(b) Variance:

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2$$

$$= \frac{(20.75)^2}{16}$$

$$= 26.91$$

(c) Standard deviation:

$$\sqrt{\text{Variance}} = \sqrt{\sigma^2} = \sqrt{26.91} \approx 5.18$$

(d) Coefficient of variation:

$$CV = \frac{\sigma}{\bar{x}} \times 100\% = \frac{5.18}{20.25} \times 100\% = 0.25\%$$

Name: Zaid Amin Rawfin

ID: 20-42459-1

Section: O

Serial: 13

Date: 28/09/2021

Assignment: 2

Serial	x_i (AGE)	\bar{x}	$x_i - \bar{x}$	$ x_i - \bar{x} $	$ x_i - \bar{x} ^2$
1	23	21.6	1.4	1.4	1.96
2	22		0.4	0.4	0.16
3	21		-0.6	0.6	0.36
4	22		0.4	0.4	0.16
5	21		-0.6	0.6	0.36
6	20		-1.6	1.6	2.56
7	21		-0.6	0.6	0.36
8	21		-0.6	0.6	0.36
9	22		0.4	0.4	0.16
10	22		0.4	0.4	0.16
11	22		0.4	0.4	0.16
12	22		0.4	0.4	0.16
13	21		-0.6	0.6	0.36
14	22		0.4	0.4	0.16
15	22		0.4	0.4	0.16

$$\text{Arithmetic Mean, AM} = \bar{x} = \frac{\sum x_i}{n} = \frac{324}{15} = 21.6$$

$$\text{Geometric Mean, GM} = (\prod x)^{\frac{1}{n}} = 21.58$$

$$\text{Harmonic Mean, HM} = \frac{n}{\sum \frac{1}{x}} = 21.57$$

Median = 22

Mode = 22

$$\text{Mean Deviation, MD} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{9.2}{15} = 0.61$$

$$\text{Variance, } \sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15} = 0.5$$

$$\text{Standard Deviation, SD, } \sigma = \sqrt{\text{Variance}} = \sqrt{0.5} = 0.71$$

$$\text{Coefficient Variation, CV} = \frac{\sigma}{\bar{x}} \times 100 = 3.29\%$$

Name:- Md. Tanvir Hasan
 ID:- 20-42488-1
 See:- O

Roll	x	\bar{x}	$x - \bar{x}$	$ x - \bar{x} $	$(x - \bar{x})^2$
1	23	$324/15 = 21.6$	$23 - 21.6 = 1.4$	1.4	1.96
2	22	21.6	0.4	0.4	0.16
3	21	21.6	-0.6	0.6	0.36
4	22	21.6	0.4	0.4	0.16
5	21	21.6	-0.6	0.6	0.36
6	20	21.6	0.4	0.4	0.56
7	21	21.6	-0.6	0.6	0.36
8	21	21.6	-0.6	0.6	0.36
9	22	21.6	0.4	0.4	0.16
10	22	21.6	0.4	0.4	0.16
11	22	21.6	0.4	0.4	0.16
12	22	21.6	0.4	0.4	0.16
13	21	21.6	-0.6	0.6	0.36
14	22	21.6	0.4	0.4	0.16
15	22	21.6	0.4	0.4	0.16
Total(n)	= 324				

$$\therefore MD = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{2.2}{15} = 0.6133$$

$$\therefore \sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15} = 0.5067$$

$$\therefore SD = \sigma = \sqrt{\text{Variance}} = \sqrt{0.5067} = 0.7118$$

$$\therefore CV = \frac{0.7118}{21.6} \times 100\% = \frac{71.18}{21.6} \times 100\% = 3.2954\%$$

Given
 $n = 23, 22, 21, 22, 21, 20, 21, 21, 22, 22, 22, 22$,
 $n = 15$

1) Mean,

a) Arithmetic mean = $\frac{\sum n}{n} = \frac{324}{15} = 21.6$

b) Geometric mean = $(\prod n)^{\frac{1}{n}} = (1.03 \times 10^{20})^{\frac{1}{15}} = 21.5868$

c) Harmonic mean = $\frac{n}{\frac{1}{\sum n}} = \frac{15}{0.695} = 21.5827$

2) Median,

$20, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 22$,
 $22, 22, 23$

$\therefore \text{Median} = 22$

3) Mode,

$20, 21, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 22$,
 $22, 22, 23$

$\therefore \text{Mode} = 21, 22$

$\Sigma ED.O = \frac{5.0}{21} = 12 - 125 \left| \frac{1}{1+3} \right| \frac{1}{N} = 0 \text{ M.} \therefore$

$\Sigma FD.O = \frac{15.0}{21} = \frac{1}{(21-15)} \left| \frac{1}{1+3} \right| \frac{1}{N} = 50. \therefore$

$125.0 = \boxed{125.0}$

Assignment - 2

Name: Md. Shajidul Islam Sadique

ID: 20-42621-1 Serial: 15

Calculated Mean deviation, Variance, Standard deviation & coefficient variation from below data set.

ID	Age	\bar{x}	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
17-35338-3	23		1.4	1.4	1.96
18-36264-1	22		0.4	0.4	0.16
18-36303-1	21		-0.6	0.6	0.36
19-41241-2	22		0.4	0.4	0.16
20-41950-1	21	<u>32.4</u>	-0.6	0.6	0.36
20-42006-1	20	<u>15</u>	-1.6	1.6	2.56
20-42042-1	21	<u>=21.6</u>	-0.6	0.6	0.36
20-42079-1	21		-0.6	0.6	0.36
20-42107-1	22		0.4	0.4	0.16
20-42439-1	22		0.4	0.4	0.16
20-42459-1	22		0.4	0.4	0.16
20-42488-1	22		0.4	0.4	0.16
20-42621-1	21		-0.6	0.6	0.36
20-42668-1	22		0.4	0.4	0.16
20-42669-1	22		0.4	0.4	0.16
Total	15		9.2	7.6	

$$\text{Mean deviation} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{9.2}{15} = 0.6133$$

$$\text{Variance } \sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15} = 0.5067$$

$$\text{Standard deviation } \sigma = \sqrt{\text{Variance}} = \sqrt{0.5067} = 0.7118$$

$$\text{Coefficient of variation} = \frac{\sigma}{\bar{x}} \times 100\% = \frac{0.7118}{21.6} \times 100\% \\ = 3.2954\%$$

From the data set,

$$n = 15, \sum_{i=1}^n x_i = 324$$

So,

Arithmetic mean:

$$AM = \bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = \frac{324}{15} = 21.60$$

Geometric mean:

$$GM = \bar{x}_G = \left(\prod_{i=1}^n x_i \right)^{\frac{1}{n}} \\ = (1.031 \times 10^{20})^{\frac{1}{15}} = 21.586$$

Harmonic mean:

$$HM = \bar{x}_H = \frac{n}{\sum_{i=1}^n \frac{1}{x_i}} = \frac{15}{0.6953} = 21.573$$

Median: Ascending order of data

$$A = 20, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 22, 22, 22, 23.$$

So median = 22

Mode: Maximum number of value that repeats in the data set, which is 22.

Name: Sidul Islam Sohag Serial: 14
 ID: 20-42668-1 Sec: O

Roll	X	\bar{X}	$\sum (x - \bar{x})^2$	$ x - \bar{x} $	$(n - \bar{n})^2$
1	23	21.6	1.4	1.4	1.96
2	22	21.6	0.4	0.4	0.16
3	21	21.6	-0.6	0.6	0.36
4	22	21.6	0.4	0.4	0.16
5	21	21.6	-0.6	0.6	0.36
6	20	21.6	-1.6	1.6	2.56
7	21	21.6	-0.6	0.6	0.36
8	21	21.6	-0.6	0.6	0.36
9	22	21.6	0.4	0.4	0.16
10	22	21.6	0.4	0.4	0.16
11	22	21.6	0.4	0.4	0.16
12	22	21.6	0.4	0.4	0.16
13	21	21.6	-0.6	0.6	0.36
14	22	21.6	0.4	0.4	0.16
15	22	21.6	0.4	0.4	0.16
	324			9.2	7.6

$$\text{Mean deviation} = \frac{9.2}{15} = 0.6133$$

$$\text{Variance} = \frac{76}{15} = 0.5067$$

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

$$= \sqrt{0.5067}$$

$$= 0.718$$

$$\text{Coefficient of Variation} = \frac{0.718}{(21.6)^2} \times 100\% \\ = 3.2954\%$$

Name: Jamnatul Ferdose Tanisha

ID : 20-42669-1

Seminal no - 17

Age: 23, 22, 21, 22, 21, 20, 21, 21, 22, 22, 22, 21, 22, 22

$$\sum \text{Age} = 324$$

Arithmetic mean:

$$\text{Arithm} = \frac{\sum N}{n} = \frac{324}{15} = 21.6$$

Geometric mean:

$$\text{geom} = (\prod n)^{\frac{1}{n}} = ((23 \times 22 \times 21 \times 22 \times 21 \times 20 \times 21 \times 21 \times 22 \times 22 \times 22 \times 22 \times 21 \times 22 \times 22)^{\frac{1}{15}}$$

$$= (1.03 \times 10^{20})^{\frac{1}{15}}$$

$$= 21.59$$

Harmonic mean: $\frac{n}{\sum \frac{1}{x}}$

$$\therefore \sum \frac{1}{x} = \frac{73873}{106260}$$

$$= \frac{n}{\sum \frac{1}{x}} = \frac{15}{\frac{73873}{106260}} = 21.58$$

Median: 20, 21, 21, 21, 21, 21, 22, 22, 22, 22,
22, 22, 22, 22, 23

Median = 22

$$\text{Mode} = \text{appt}$$

Mode:

Mode = 22

$$\text{Mode} = \frac{\sum f_i}{\sum f_i} = \text{Mode}$$

$$\text{Mode} = \frac{\sum f_i x_i}{\sum f_i} = \frac{1}{N} (\text{Max}) = \text{Mode}$$

$$\frac{1}{21} (20 \times 10 + 20.1) =$$

$$20.15 =$$

$$\frac{N}{\sum f_i} = \text{mean symmetr.}$$

$$\text{Mean} = \frac{1}{N} \sum f_i x_i$$

$$20.15 = \frac{1}{21} \sum f_i x_i$$

Sl.	I_{11}	x	\bar{x}	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
1	17-35338-3	23	21.6	1.4	1.4	1.16
2	18-36264-1	22	21.6	0.4	0.4	0.16
3	19-41241-2	22	21.6	0.4	0.4	0.16
4	20-41259-1	22	21.6	-0.6	0.6	0.36
5	20-42006-1	21	21.6	-10.6	1.6	2.36
6	20-42092-1	20	21.6	-0.6	0.6	0.36
7	20-42107-1	21	21.6	0.6	0.6	0.36
8	20-42439-1	21	21.6	0.4	0.4	0.16
9	20-42459-1	22	21.6	0.4	0.4	0.16
10	20-42079-1	22	21.6	-0.4	0.4	0.16
11	18-36303-1	21	21.6	0.6	0.6	0.36
12	20-42488-1	22	21.6	-0.4	0.4	0.16
13	20-42621-1	21	21.6	0.6	0.6	0.36
14	20-42668-1	22	21.6	0.64	0.64	0.16
15	20-42669-1	22	21.6	0.4	0.4	0.16
					9.2	7.6

Mean deviation:

$$MD : \frac{1}{n} = \sum_{i=1}^n |x_i - \bar{x}| = \frac{2.2}{15} = 0.147$$

Variance:

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15}$$

Standard deviation:

$$SD = \sigma = \sqrt{\text{Variance}} = \sqrt{0.51} = 0.714$$

Co-efficient variation:

$$CV = \frac{\sigma}{\bar{x}} \times 100\%$$

$$CV = \frac{0.714}{21.6} \times 100\%$$

$$= 3.30\%$$