Muneeb Lone 231-2623

Dept: DS-B Date: / /

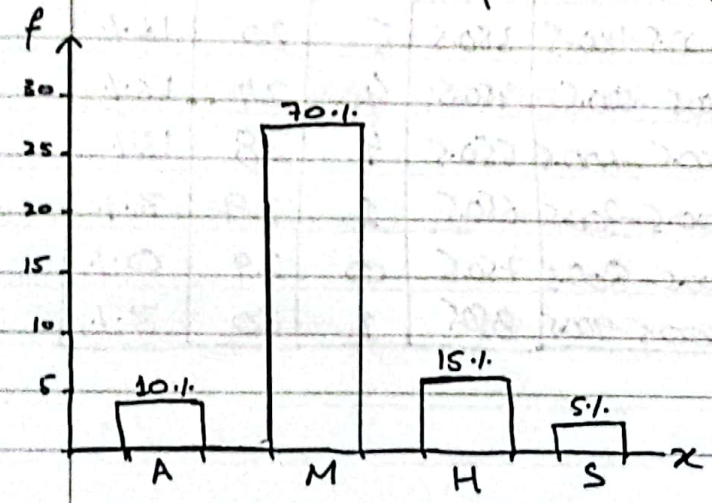
# Assignment #1

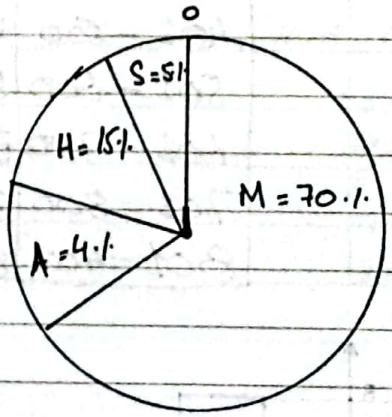
Q1(b)

| x | f | r.f | c.f |
|---|---|---|---|
| A | 4 | 10% | 4 |
| M | 28 | 70.1. | 32 |
| H | 6 | 15.1. | 38 |
| S | 2 | 5.1. | 40 |
| | Σf=40 | | |

Interpretation: 28 people trust in most of what they read on the internet, 4 people believe in everything they read, 6 people trust about half while 2 people trust only a small portion of online content.

(a)




(c) Interpretation: 10.1. of people believe everything they read on the internet, 70.1. believe most of what they read and 15.1. trust about half meanwhile only 5.1. trust a small amount of online content

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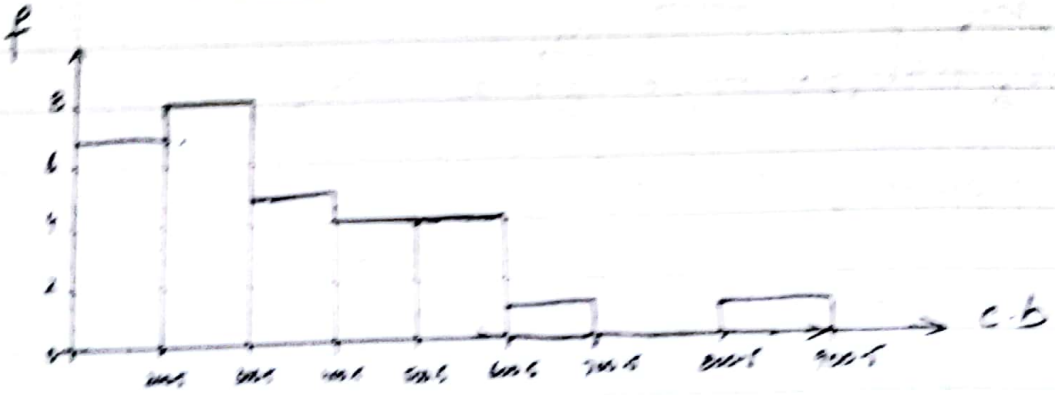
Q2(a) Arrange:

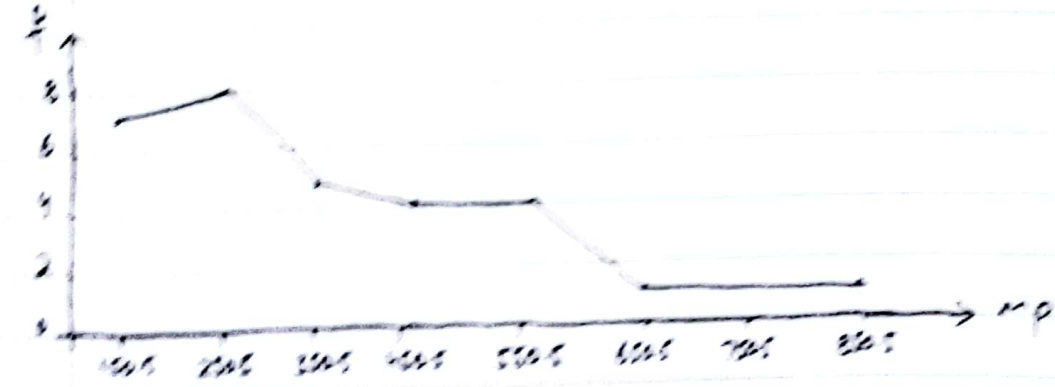
140, 146, 164, 144, 133, 188, [redacted], 201, 210, 225, 225, 238, 261, 275, 247, 307, 330, 381, 385, 390, 415, 435, 450, 478, 515, 541, 550, 578, 684, 857

| Class | Class Boundary | MP | f | cf | x·f |
|---|---|---|---|---|---|
| 100-200 | 100.5-200.5 | 150.5 | 7 | 7 | 23·1· |
| 201-300 | 200.5-300.5 | 250.5 | 8 | 15 | 26·1· |
| 301-400 | 300.5-400.5 | 350.5 | 5 | 20 | 16·1· |
| 401-600 | 400.5-600.5 | 400.5 | 4 | 24 | 13·1 |
| 501-600 | 500.5-600.5 | 550.5 | 4 | 28 | 13·1 |
| 601-700 | 600.5-700.5 | 650.5 | 1 | 29 | 3·1· |
| 701-800 | 700.5-800.5 | 750.5 | 0 | 29 | 0·1· |
| 801-900 | 800.5-900.5 | 850.5 | 1 | 30 | 3·1· |

(a)




(b)



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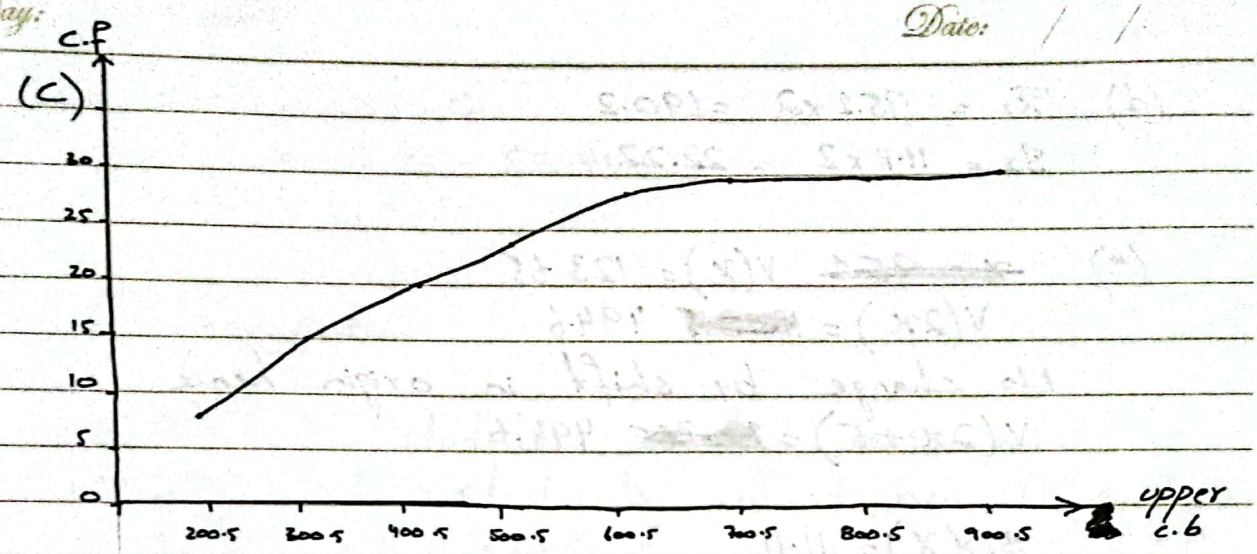
(c)




Q3: Data: 78, 80, 87, 88, 97, 100, 101, 103, 106, 110

(a) $\bar{x} = \frac{78+80+87+88+97+101+101+103+106+110}{10} = 95.1$

$\tilde{x} = \frac{97+101}{2} = 99$

$\hat{x} = 101$

(b) Range = 110 − 78 = 32

Variance $= \frac{1}{n-1}\left(\Sigma x^2 - \frac{(\Sigma x)^2}{n}\right) = \frac{1}{9}\left(951^2 - \frac{951^2}{10}\right)$

$S^2 = 123.65$

S.D $= S = \sqrt{123.65} = 11.11$

(c) $\bar{x} = 95.1 = \frac{951}{10}$

$\bar{x}_2 = \bar{x} + y$

$y = 10$; $\bar{x}_2 = 95.1 + 10 = 105.1$

$S_2 = 11.11$ (Change in origin does not affect)

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(d) $\bar{x}_2 = 95.1 \times 2 = 190.2$

$S_2 = 11.11 \times 2 = 22.22$

(e) ~~$x = 95.1$~~ $V(x) = 123.65$

$V(2x) = $ ~~$\quad$~~ $494.6$

No change by shift in origin hence

$V(2x+5) = $ ~~$\quad$~~ $494.6$

$SD(x) = 11.11$

$S.D(5x) = 55.55$

No change by shift in origin hence

$S.D(5x-3) = 55.55$

Q4: 11, 51, 58, 61, 65, 67, 72, 73, 75, 78, 80, 97

(a) $Q1 = \frac{1}{4}(13)^{th}$ value $= 3.25^{th}$

$= 58 + 0.25(61-58)$

$= 58.75$

$Q2 = \frac{1}{2}(13^{th})$ value

$= 6.5^{th}$ value

$= 67 + 0.5(72-67)$

$= 69.5$

$Q3 = \frac{3}{4}(13^{th})$ value

$= 9.75$

$= 75 + 0.75(78-75) = 77.25$

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IQR = Q3 - Q1
= 77.25 - 58.75
= 18.5

Interpretation:

→ 75% of students scored below 77.25
→ 25% of students scored b/w 11 and 58.75
→ 50% of students scored below 69.5

(b) $D5 = \frac{5}{10}(13^{th})$ value
= $6.5^{th}$ val
= $67 \times 0.5(72-67) = 69.5$

50% scored ~~marks~~ are above 69.5

$P_{43} = \frac{43}{100}(13^{th})$ value
= 5.59
= 65 + 0.59(67 - 65)
= 66.18

43% of students scored below 66.18

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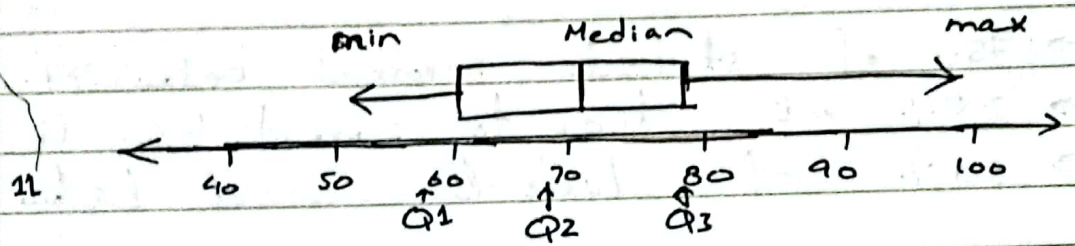
(c) L.F = $Q_1 - 1.5 \times IQR = 31$

U.F = $Q_3 + 1.5 \times IQR = 105$

11 is an outlier as it is below the lower fence.

(d)




(e) As the line on the right side extends farther, we can conclude this distribution is positively skewed.

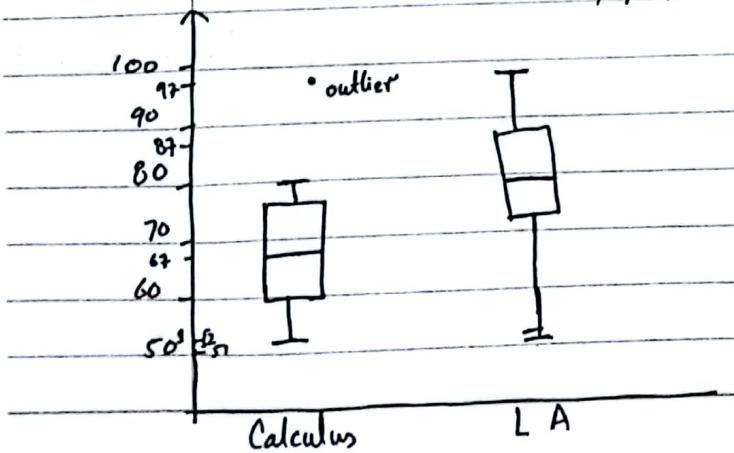
Q5 $C.V = \frac{S}{\bar{x}} \times 100 = \frac{\sqrt{\frac{(x-\bar{x})^2}{n-1}}}{\bar{x}} \times 100$

$\bar{x}_1 = 68.07$ $\quad \Sigma x_1 = 1021$

$\bar{x}_2 = 77.27$ $\quad \Sigma x_2 = 1159$

$(C.V)_1 = \frac{\sqrt{\frac{1}{14}((1021)^2 - 69496.06}}{68.07} \times 100 = 16.19\%$

$(C.V)_2 = \frac{\sqrt{\frac{1}{14}\left(91733 - \frac{1343281}{151}\right)}}{77.27} \times 100 = 16.15\%$

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Interpretation: Linear Algebra students performed better overall, with higher median scores and a larger range, which shows more diversity in performance.
Calculus Students had a lower median score but the data is more concentrated in the middle showing consistency however one outlier pushes top scores higher.

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