Measures of Central Tendency.

1. a) 2.4 3.5 1.9 3.0 3.5 2.4 1.6
3.8 1.2 2.4 3.1 2.7 1.7 2.2
3.3

Mean $\bar{x}$ = $\frac{2.4 + 3.5 + 1.9 + 3.0 + 3.5 + 2.4 + 1.6 + 3.8 + 1.2 + 2.4 + 3.1 + 2.7 + 1.7 + 2.2 + 3.3}{15}$

Mean $\bar{x}$ = $\frac{38.7}{15}$

mean $\bar{x}$ = 2.58.

b) Median.
1.2, 1.6, 1.7, 1.9, 2.3, 2.4, 2.4, 2.4, 2.7, 3.0, 3.1, 3.3, 3.5, 3.5, 3.8
Median = 2.4

c) Mode. = 2.4.

2. a). 11, 12, 13, 14, 15, 16, 17, 18.

b) 2, 6, 7, 9, 1, 3, 4, 7.

c) 2.4, 2.3, 1.6, 2.3, 0.9, 1.6, 3.2, 2.7.

d) 9, 7, 4, 10, 5, 3, 2, 5.

3. Term work - 87%
70% ⇒ 100 marks.
? ⇒ 87 marks

$\frac{70}{100} \times \frac{87}{100}$ = 60.9% final grade.

Exam:
30% ⇒ 100 marks
? ⇒ 71 marks

$\frac{30}{100} \times \frac{71}{100}$ = 21.3%.

Total = (21.3 + 60.9)
= 82.2%.

4. a) baseball cap sizes.
Mode.
The data is an ordinal data.

b) Standardized test scores for 2000 students.
Mean.
The data is a nominal data.

c) final grades for a class of 18 students
Mean.
The data is nominal

d) lifetimes of mass-produced items, such as batteries or light bulbs.
Median.
The data is ordinal.

5. Nadia: (4×2) + (4×2) + 4
= 8 + 8 + 4
= 20.

Enzo: (5×2) + (2×2) + 3
= 10 + 8 + 3
= 21

Stephan: (5×2) + (3×2) + 4
= 10 + 6 + 4
= 20.

∴ Enzo wins since he has the highest interview score.

8. a)

$\text{Paulo} = \frac{\Sigma x}{n} = \frac{15}{4} = 3.75$.

$\text{Janet} = \frac{\Sigma x}{n} = \frac{17}{4} = 4.25$.

$\text{Jamie} = \frac{\Sigma x}{n} = \frac{16}{4} = 4.00$.

b)

$\text{Paulo} = \frac{\Sigma wx}{\Sigma w} = \frac{(3\times4)+(2\times4)+(2)(2)+(1)(5)}{8}$

$= \frac{29}{8} = 3.630$.

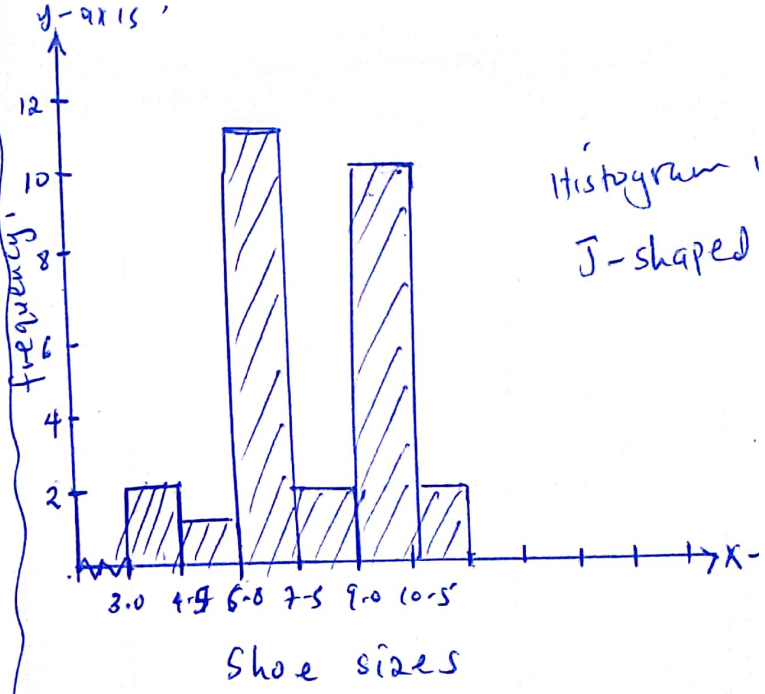
$\text{Janet} = \frac{\Sigma wx}{\Sigma w} = \frac{9+8+10+5}{8} = \frac{32}{8} = 4.000$

$\text{Jamie} = \frac{\Sigma wx}{\Sigma x} = \frac{15+8+6+4}{8} = \frac{33}{8} = 4.125$

c) Janet wins the award. She has the highest mean score and weighted mean score.

c

class	f
3.0 – 4.4	2
4.5 – 5.9	1
6.0 – 7.4	11
7.5 – 8.9	2
9.0 – 10.4	10
10.5 – 11.9	2.



9 a) Mean

$\bar{x} = \frac{\Sigma x}{x} = \frac{224}{28} = 8.0$

median = 7.5

mode = 7.0.

b) The mean has the greatest significance of A1. since it includes all of the data in the calculations.

10. a) Goals = 6 x 15.

= 90 goals

b) $\bar{x} = \frac{\Sigma x}{n}$

$6 = \frac{\Sigma x}{15}$

$\Sigma x = 6 \times 15 = 90$ goals.

11.

Class	f	x	fx	c.f.	
20-30	12	25	300.	12	
30-40	24	35	840	36.	
40-50	32	45	1440.	68	
50-60	19	55	1045	87	
60-70	9	65	585	96	
70-80	3	75	225	99	
80-90	0	85	0	99	
90-100	1	95	95	100.	
	$\Sigma f =$ 100.		$\Sigma fx =$ 4530.		

a) $\bar{x} = \frac{\Sigma fx}{\Sigma f} = \frac{4530}{100} = 45.30.$

b) $\frac{n}{2} = \frac{100}{2} = 50$

$\text{Median} = L + \frac{\left(\frac{n}{2} - cf\right)i}{f}$

$= 40.0 + \frac{(50 - 36)10}{32}$

$= 40 + 4.375$

$= 44.375.$

$\simeq 44.38.$

c) $\frac{n}{4} = \frac{100}{4} = 25$

$Q_1 = L + \frac{\left(\frac{1}{4}n - cf\right)i}{f}$

$= 30 + \frac{(25 - 12)10}{24}$

$= 30 + 5.417$

$= 35.417 \simeq 35.42.$

$Q_3 = L + \frac{\left(\frac{3n}{4} - cf\right)i}{f}$

$= 50 + \frac{(75 - 68)10}{19}$

$= 50 + 3.68 \simeq 53.68.$

High value of outlier causes the mean to be higher than the median.
Low outlier causes the mean to be lower than the median.