

Central Tendencies assignment.

1. a) 9, 7, 11, 13, 2, 4, 5, 5

$$\frac{\sum x_i}{n} = 7.$$

b) 2.2, 10.2, 14.7, 5.9, 4.9, 11.1, 10.5

$$\frac{\sum x_i}{n} = 8.5$$

c) $1\frac{1}{4}$, $2\frac{1}{2}$, $5\frac{1}{2}$, $3\frac{1}{4}$, $2\frac{1}{2}$

$$\frac{\sum x_i}{n} = 11.4$$

2. Fibonacci series; 0, 1, 1, 2, 3, 5, 8, 13, 21, 34

$$\frac{\sum x_i}{n} = 8.8$$

3. Prime numbers, 2, 3, 5, 7, 11

- Mean, $\frac{\sum x_i}{n} = 5.6$

- Median, n is odd hence $\left(\frac{n+1}{2}\right)^{\text{th}}$ element is median. Hence 5 is the median here.

4. $\mu = 66$

$$\frac{8 + 11 + 6 + 14 + x + 13}{6} = 66$$

$$\frac{52 + x}{6} = 66$$

$$\boxed{x = 344}$$

$$5. \mu = 9$$

$$\frac{6 + 8 + x + 2 + 10 + 2x - 1 + 2}{6} = 9$$

$$3x + 27 = 54$$

$$\boxed{x = 9}$$

6. a) Mean age of 20 boys;

$$\frac{\sum x_i}{n} = \frac{12 + 10 + 15 + 14 + 8}{20} =$$

$$= \frac{12 \times 5 + 10 \times 3 + 15 \times 2 + 14 \times 6 + 8 \times 4}{20}$$

$$= \frac{60 + 30 + 30 + 84 + 32}{20} = 11.8 //$$

b) Marks by 40 students.

$$\frac{\sum x_i}{n} \Rightarrow \frac{25 \times 8 + 30 \times 12 + 15 \times 10 + 20 \times 6 + 24 \times 4}{40}$$

$$\Rightarrow \frac{200 + 360 + 150 + 120 + 96}{40}$$

$$\Rightarrow 23.15 //$$

7. Mode;

$$a) 12, 8, 4, 8, 1, 8, 9, 11, 9, 10, 12, 8 \\ = 8 //$$

$$b) 15, 22, 17, 19, 22, 17, 29, 24, 17, 15 \\ = 17 //$$

$$c) 0, 3, 2, 1, 3, 5, 4, 3, 4, 2, 1, 2, 0 \\ = 3 //$$

$$d) 1, 7, 2, 4, 5, 9, 8, 3 \Rightarrow \text{no mode} \\ \neq$$

8. Median ; 25

$$17, x, \cancel{x+24}, x+7, 35, 36, 46$$

Since ~~even~~; median would be. $x+7 = 25$

Since odd;

$$\therefore \boxed{x = 18}$$

9. In the above problem; the numbers are not in ascending order hence;

→ Re-arrange the sequence such that $x+7$ comes before $x+24$ since logically $x+24 > x+7$.
 $x+24$ and $x+7$
 x should be a value such that it lies [^] between 17 and 35.

x can only be (10 or 11)

$$10 \Rightarrow 17, 17, 34, 35, 36, 46$$

$$11 \Rightarrow 17, 18, 35, 35, 36, 46.$$

10. a) Mean or median can be used after arranging the temperature in ascending order. Mean should be ignored if outlier exists.

b) Mean should not be used if outliers exist ~~and~~ as they tend to overshoot the correct value.

c) Mean if no outliers and median can be used.

d) Mode is used to identify the common one.

CONFIDENCE INTERVAL ASSIGNMENT

1. $n = 1000$

95% CI?

$S = 180$ pounds.

~~$S = 30$ pounds.~~ $SE = 30$ pounds. (standard deviation of sample is standard error)

$$\mu_{pop} = S \pm 2 SE$$

$$= \cancel{180} \pm 2 \cancel{30} \quad 180 \pm 2(30)$$

$\sqrt{1000}$

$$= \cancel{180} \pm \cancel{1.897} \quad 120 < \mu_{pop} < 240$$

$$\therefore \cancel{178.013} < \mu_{pop} < \cancel{181.897}$$