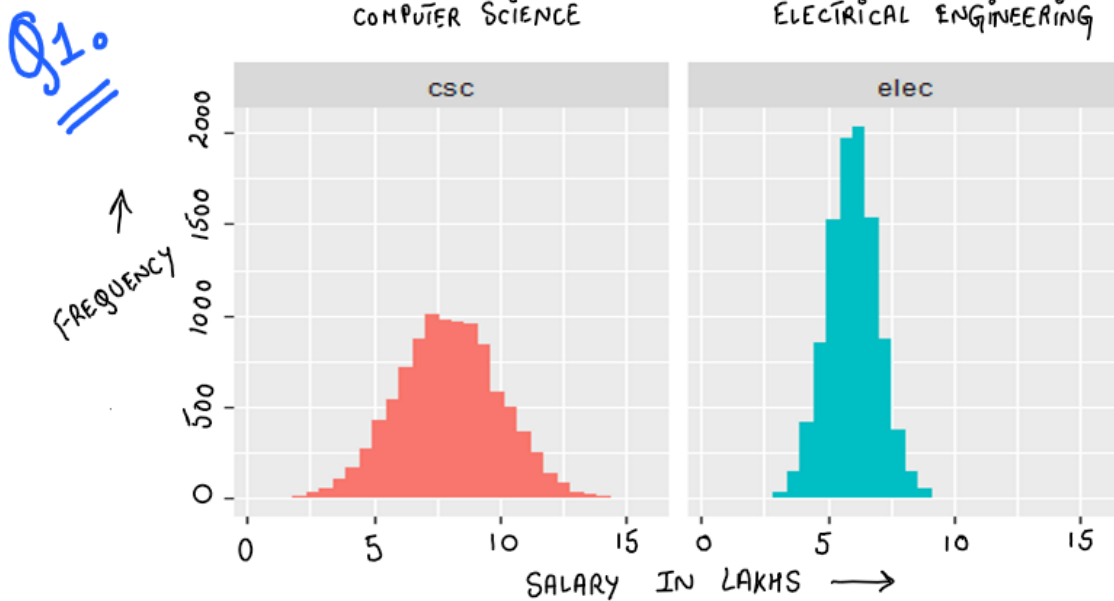
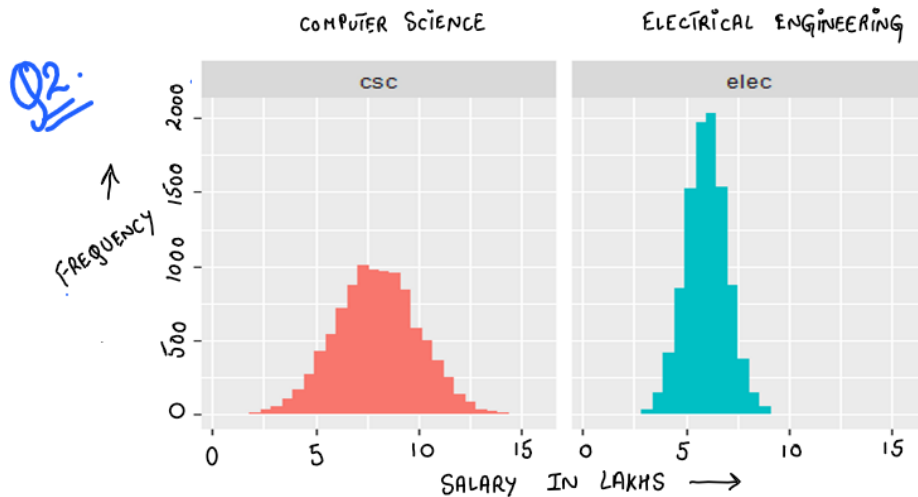


LESSON 3 : CENTRAL TENDENCY



How Much SALARY Do MOST ELECTRICAL ENGINEERING STUDENTS MAKE AS COMPARED TO COMPUTER SCIENCE ENGINEERING STUDENTS ?



CHOOSE ONE NUMBER (OR SMALL RANGE OF NUMBERS) THAT ACCURATELY REPRESENTS THE TYPICAL SALARY OF COMPUTER SCIENCE AND ELECTRICAL ENGINEERING STUDENTS ?

- ☐ VALUE AT WHICH FREQUENCY IS HIGHEST
- ☐ VALUE IN THE MIDDLE
- ☐ VALUE WHERE FREQUENCY IS LOWEST
- ☐ BIGGEST VALUE ON X-AXIS
- ☐ AVERAGE

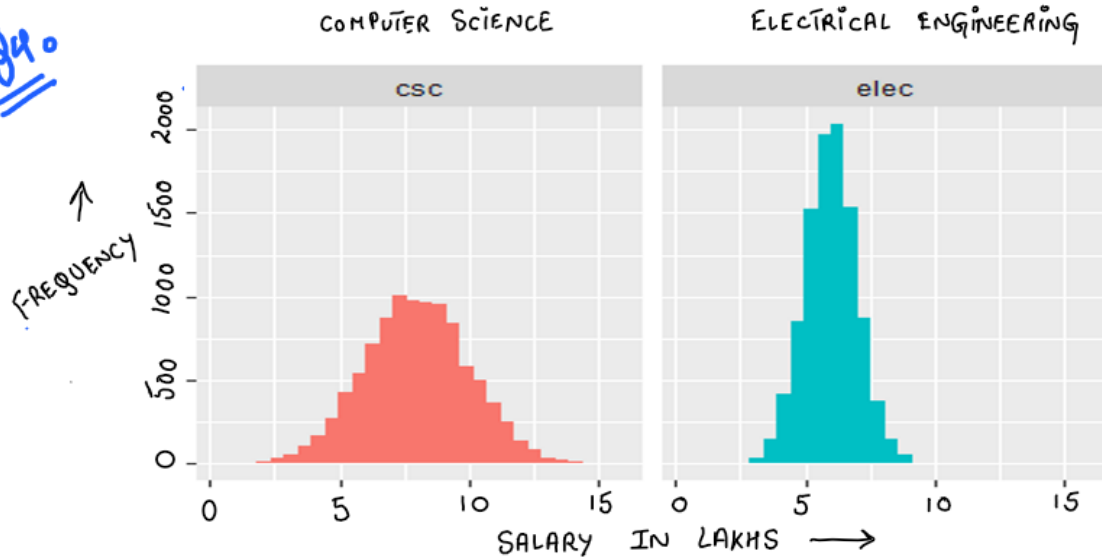
MODE

Q3.

WHAT IS MODE IN THE GIVEN VALUES ?

2, 3, 5, 9 ; 4, 9, 10

Q4.



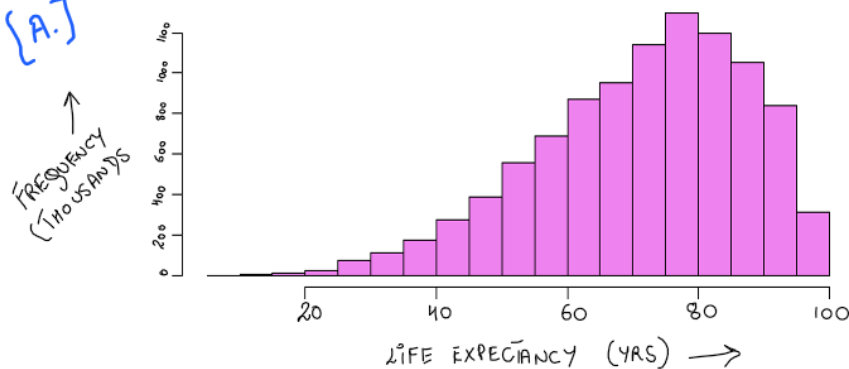
WHAT IS THE MODE ?

- SINGLE NUMBER THAT OCCURED WITH HIGHEST FREQUENCY
- RANGE THAT OCCURED WITH HIGHEST FREQUENCY

Q6.


WHERE DOES THE MODE OCCUR ON THESE DISTRIBUTIONS ?


[A.]



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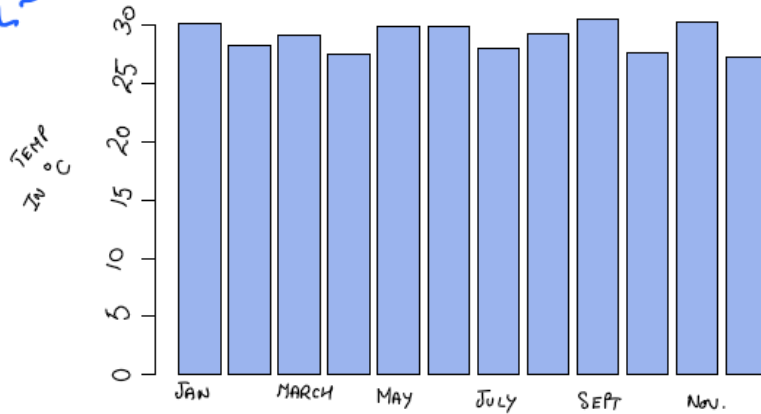
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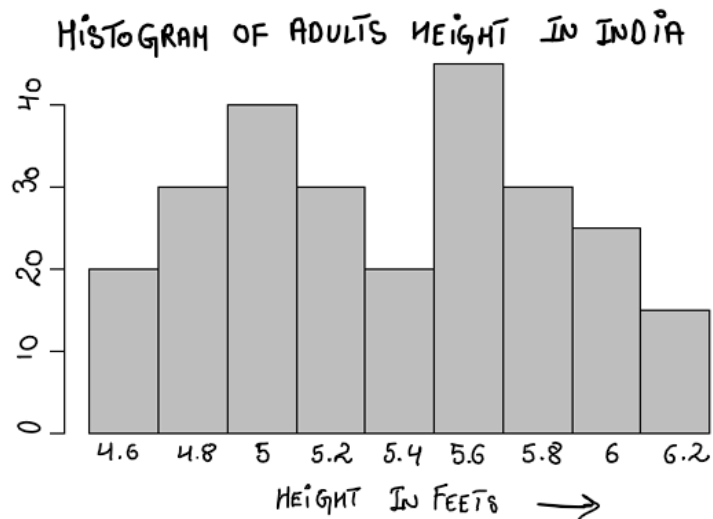


[B.]



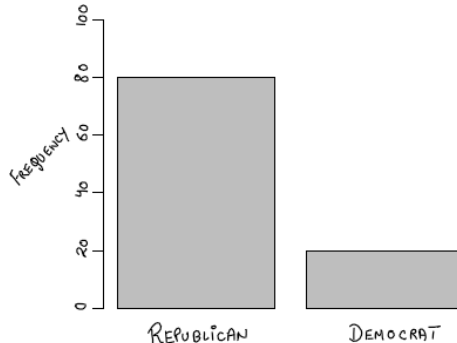
MULTIMODAL DISTRIBUTION

Q6



WHAT IS THE MODE ?

Q8.



WHAT IS THE MODE ?

- ☐ REPUBLICAN
- ☐ DEMOCRAT
- ☐ 80
- ☐ 20

Q8.

PROPERTIES OF MODE

TRUE/FALSE

(A.) THE MODE CAN BE USED TO DESCRIBE ANY TYPE OF DATA
(NUMERICAL OR CATEGORICAL)

☐

(B.) ALL VALUES IN THE DATASET AFFECT THE MODE

☐

(C.) IF LOT OF SAMPLES ARE TAKEN FROM THE SAME
POPULATION, THE MODE WILL BE SAME IN EACH SAMPLE

☐

(D.) THERE IS AN EQUATION FOR THE MODE

☐

MEAN

Q9.

CALCULATE THE MEAN FOR THE SAMPLES GIVEN BELOW?
(TAKEN RANDOM SAMPLES OF SIZE 5 FROM Q1.)

ELECTRICAL ENGG. (SALARY IN LAKHS)	COMPUTER SC. ENGG. (SALARY IN LAKHS)
5.8	10.1
8.7	7.1
6.6	7.8
5.2	13.0
6.7	8.1

$$\bar{X}_{\text{ELEC}} = \underline{\quad ? \quad}$$

$$\bar{X}_{\text{COM}} = \underline{\quad ? \quad}$$

Q10.

PROPERTIES OF MEAN

(a.) THE MEAN CAN BE DESCRIBED WITH A FORMULA

☐

(b.) ALL VALUES IN THE DISTRIBUTION AFFECT THE MEAN

☐

(c.) DIFFERENT SAMPLES FROM THE SAME POPULATION HAVE
SIMILAR MEANS

☐

(d.) THE MEAN WILL CHANGE IF WE ADD EXTREME VALUES
TO THE DATASET

☐

Q11.

ELECTRICAL ENGG. (SALARY IN LAKHS)	COMPUTER SC. ENGG. (SALARY IN LAKHS)
5.8	10.1
8.7	7.1
6.6	7.8
5.2	13.0
6.7	8.1
	50

$$\bar{X}_{\text{com}} = \underline{\quad ? \quad}$$

Q12.

$$\bar{X}_{\text{com}} = 16.1 \text{ LAKHS}$$

- ☐ THIS AVERAGE ACCURATELY REPRESENTS THE SALARY OF COMPUTER ENGINEERING STUDENTS
- ☐ THIS AVERAGE IS MISLEADING

MEDIAN

Q13.

ELECTRICAL ENGG. (SALARY IN LAKHS)	COMPUTER SC. ENGG. (SALARY IN LAKHS)
5.8	10.1
8.7	7.1
6.6	7.8
5.2	13.0
6.7	8.1

FIND THE MEDIAN FOR BOTH?

Q14.

ELECTRICAL ENGG. (SALARY IN LAKHS)	COMPUTER SC. ENGG. (SALARY IN LAKHS)
5.8	10.1
8.7	7.1
6.6	7.8
5.2	13.0
6.7	8.1
	50

FIND THE MEDIAN FOR COMPUTER SCIENCE STUDENTS?

SUMMARY

ELECTRICAL ENGG. (SALARY IN LAKHS)	COMPUTER SC. ENGG. (SALARY IN LAKHS)	MEAN = 9.2	MEAN = 16.1
5.8	10.1	MEDIAN = 8.1	MEDIAN =
8.7	7.1		
6.6	7.8		
5.2	13.0		
6.7	8.1		
	50		↑ ROBUST

MEAN → CHANGED A LOT

MEDIAN → LITTLE VARIATION SEEN, AND THIS TENDENCY OF MEDIAN IS CALLED ROBUST.

(i.e. not affected much by departures of the norm.)

MEAN

/

DOESN'T DESCRIBE
CENTRE WHEN THEIR
IS AN OUTLIER.

MEDIAN

(MEASURES OF CENTER)

|

DOESN'T TAKE EVERY
DATA POINT INTO ACCOUNT

|

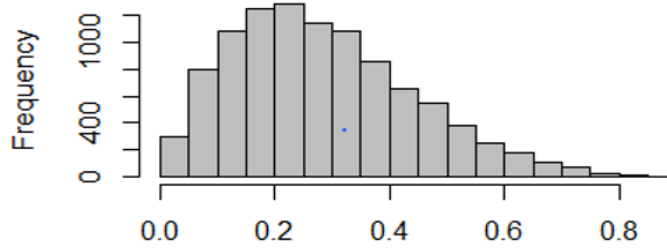
ALWAYS THE BEST MEASURE OF
CENTRAL TENDENCY WITH HIGHLY SKEWED
DISTRIBUTIONS

MODE

\

DOESN'T DESCRIBE
CENTRE ALWAYS
(best in categorical data)

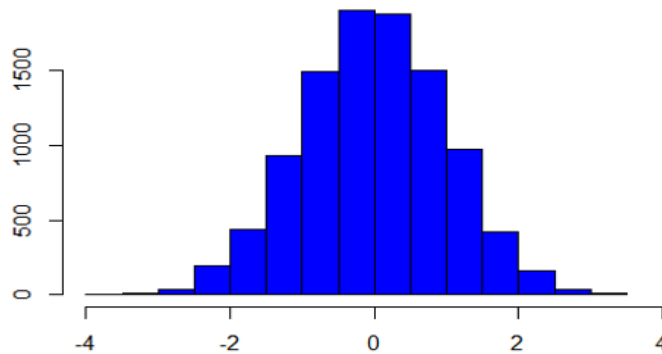
Q15.



Which Is True About The Distribution?

- (a.) $MEAN < MEDIAN < MODE$
- (b.) $MEDIAN < MODE < MEAN$
- (c.) $MODE < MEDIAN < MEAN$
- (d.) $MODE < MEAN < MEDIAN$

Q16.



Which Is True About The Distribution?

MEAN $\left[\begin{array}{c} < \\ = \\ > \end{array} \right]$
 MEDIAN $\left[\begin{array}{c} < \\ = \\ > \end{array} \right]$
 MODE

Q17.

WHAT'S THE FORMULA FOR MEDIAN?

n EVEN

- $x_{n/2}$
- $x_{n-1/2}$
- $\frac{x_{n/2} + x_{n/2+1}}{2}$
- $x_{n/2} + 1$

n ODD

- $x_{n/2}$
- $x_{\frac{n+1}{2}}$
- $x_{\frac{n-1}{2}}$
- $x_{n/2} + 1$


Q18.


PROS AND CONS OF MEASURES OF
CENTRAL TENDENCY

- | | |
|--|----------------------|
| (a.) HAS A SIMPLE EQUATION | MEAN / MEDIAN / MODE |
| (b.) WILL CHANGE IF ANY VALUE IN DATASET CHANGES | MEAN / MEDIAN / MODE |
| (c.) WILL NOT BE AFFECTED BY CHANGE IN BIN SIZE | MEAN / MEDIAN / MODE |
| (d.) NOT AFFECTED SEVERELY BY OUTLIERS | MEAN / MEDIAN / MODE |
| (e.) CAN BE EASILY FOUND ON HISTOGRAM. | MEAN / MEDIAN / MODE |

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