Raj Agrawal Mohit

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9/1

Ans Part-a

(a) mean = (Sum of all elements of table) / total elements of table

= 57.64

(b) median = 56

(To calculate median make this matrix into 1D matrix and then calculate median by this formula)

if n is odd :- mat[n/2]

if n is even :- $\frac{mat[(n-1)/2] + mat[n/2]}{2}$

(c) mode = 46 (most frequent values)

Part-b Table is arranged in increasing order in columns. The position $P_{10} = 10 \times (51)/100 = 5.1$

we can round off 5.1 to its nearest integer which is 5. The corresponding value from table is 21 (10% of observations have a value of less than or equal to 21 i.e., by 21 hrs, 10% of the wire-cuts will fail. In asset management the value is called P_{10} life.

Instead of rounding the value, we can use the following approximation

$$P_{10} = 10 \times (51)/100 = 5.1$$

value at 5th position is 21. value at position 5.1 is approximate as 21 + 0.1 × (value at 6th position − value at 5th position) = 21 + 0.1 × 1

= 21.1

$$P_{90} = 90 + 51/100$$

$$= 45.9$$

The value at position 45 is 90 & at position 45.9 is

$$90 + (0.9) \times 3 = 92.7$$

That is 90% of wire cuts will fall by 92.7 hours

Part C

P_{25} (1st quartile or Q_1) $= 25 \times 51/100$

$= 12.75$

The value at 12th position is 33 So,

$P_{25} = 33 + 0.75$ (value at 13^{th} position − value at n^{th} position)

$33 + 0.75(1) = 33.75$

P_{75} (3^{rd} quartile or Q_3) $= 75 + 51/100 = 38.25$

The value at 38^{th} position is 86 so,

$P_{75} = 86 + 0.25$ (value at 39^{th} position − value at 38^{th} position) =

$86 + 0.25(0) = 86$

——— X ———