Random Variables

↓

Variable = $x = 5$

$2x + 6 = 0$

Process or Experiment → Value / Variable.

Ex → Experiment = H, T — Coin — Head / Tail

X ← { 0 — Head, 1 — Tail }

↓

Random Variable -

Ex → Dice X { 0, 1, 2, 3 }

Ex → Cards -

Types

- Discrete Random Variable
  ↓
  complete or countable
- Continous Random Variable
  ↓
  infinite number

1) Tossing a coin

2) Dice Roll

Possible

↓

Height → {. . . . . }

Ex → Height, weight →

Application => Discrete → predictive Modeling

Couting -

Continuous → Distribution Analysis (13.6)

Percentage → Percentiles & Quartiles .

Percentage : 70 → Marks

100 → Marks

% = $\frac{\text{got}}{\text{Total}} \times 100$ => $\frac{70}{100} \times 100 = 70\%$

Dataset = { 1, 2, 3, 4, 5, } => $\frac{3}{5} \times \frac{20}{100} = 60\%$

How much % of value are before 3 →

Ranking = Percentile →

100

← 90% → 10%

99% →

आगे

Exam

1000

Percentile ⇒ of a value = 4 = $\frac{\text{No of values below '4}}{n} \times 100$

⇒ 4 → $\left(\frac{4}{12} \times 100 \right) = 33\%$

→ कितने % value are Below than Number — Purpose of Ranking

1) Indentify outlier

Minimum y 2) 25 Quartile (25%) 3 Median
4) 3rd Quartile (7T%) 5) Maximum
poutier

2) Risk Analysis

3) Threshold value

Eg: 1, 2, 2, 2, 3, 3, 4,5, 5, 5, 6, 6, 6, 6, 7, 8,8,9, 127
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25% → { 1, 2, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6 } = 12

$$\text{Value} = \frac{\text{Percentile} \times (n+1)}{100}$$

$$\Rightarrow \frac{25 \times 12+1}{100} = \frac{13}{4} = 3.$$

Quartile ⇒ Quarter = $\frac{1}{4}$ = 100

25 i.
50
75
100

⊕ 25% → 1 Quartile
50 -: → 2 Hum
75 i. → 3 Quartile

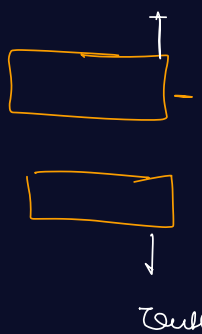
Data ⇒ { IQR → (Spread)
Outlier →
EAD → Quartile }

5 Number Summary

Threshold = Min value = 3 } 7 }
Max = 40 } 30 }

① IQR = Inter Quartile Range ⇒ $Q_3 - Q_1$
75% 25%

② Lower Bound ⇒ $Q_1 - 1.5 \times IQR$ =
Upper Bound = $Q_3 + 1.5 \times IQR$ =



Outlier

5 Number summary ⇒

1. Min value ⇒ 4
2. Q_1 → First Quartile → ?
3. Median = 15
4. Q_3 → 75% → ?
5. Max number → 35

4 7 8 12 15 18 21 24 30 35 = 10

$Q_1 = 25\% \rightarrow \frac{25 \times (n+1)}{100} = \frac{25 \times 11}{100} = \frac{275}{100}$

$Q_1 = 2$

$Q_2 = 75\% \Rightarrow \frac{75 \times 11}{100} = \frac{825}{100} = 8.25$

$Q_3 = 24$

$$IQR = Q_3 - Q_1 = 24 - 8 = 16$$

8 - 24

(-) $8 - 1.5 \times 16 = -16$

(+) $24 + 1.5 \times 16 = 48$

$24 + 24 = 48$

(+) Report = outlier = Box plot = IQR =

(*) Datascum - EDA

↳ Extreme Mode → Outlier X