

$$PL = \frac{P}{100} (N+1)$$

$$N=10$$

data = [78, 82, 84, 88, 91, 93, 94, 96, 98, 99] 100

$$Q_1 = 25\%$$

$$PL = \frac{25}{100} (11) = \frac{1}{4} (11) = \frac{11}{4} = 2.75$$

Position

$$= 2^{nd} + 0.75(3^{rd} - 2^{nd})$$

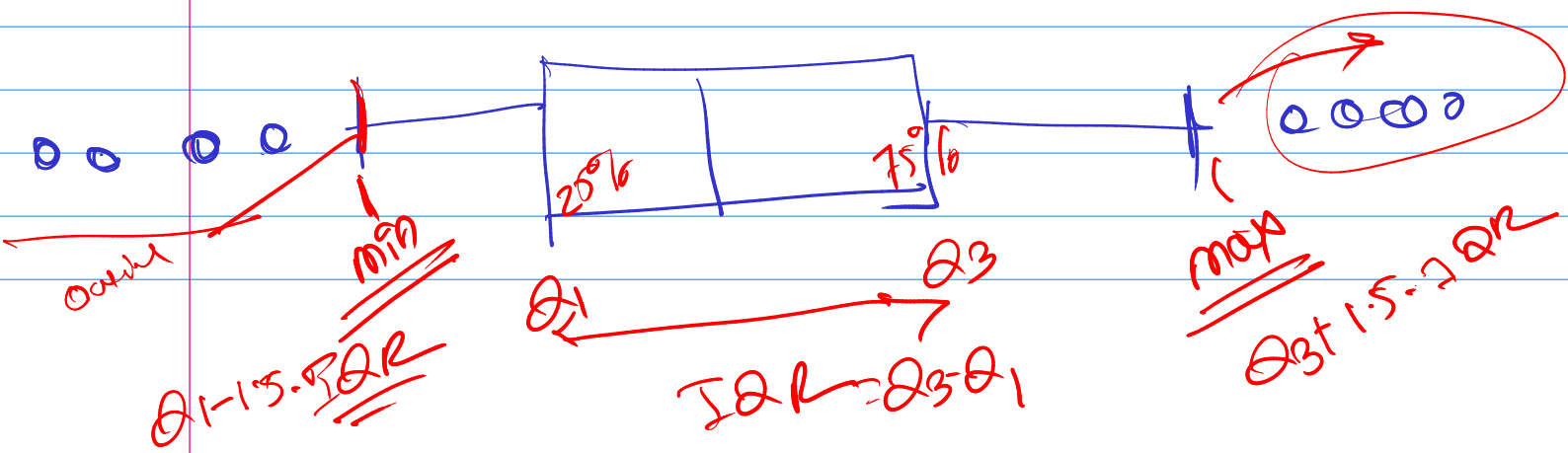
$$= 82 + 0.75(84 - 82)$$

$$= 82 + 0.75(2)$$

$$= 83.5 \Rightarrow 25\%$$

$$np.quantile(data, 0.25) =$$

outlier Detection



IQ Level  
Analysis

# Probability Distribution

(Chance)

→ chances of event occurring.

$$\text{Probability (P)} = \frac{\text{no. of favorable outcome}}{\text{Total no. of outcome.}}$$

ex = Tossing a coin :-

$$\text{no. of outcome} = \{H, T\} = 2$$

$$P(H) = \frac{1}{2}$$

$$P(T) = \frac{1}{2}$$

$$\boxed{\text{Total probability} = 1}$$

$$P(H) + P(T) = 1$$

$$1/2 + 1/2 = 1$$

Variable

→ It is a container that contain value.

## ① Algebraic Variable.

$$x + 5 = 10$$

$$x = 10 - 5$$

Variable  $\rightarrow$   $x = 5$   $\leftarrow$  fix Value

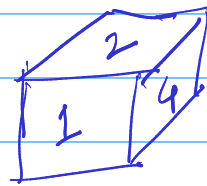
② Random Variable  $\Rightarrow$  Not a fix Value.

① Tossing a Coin  $= x = \{H, T\}$

Tossing Two Coins  $=$   ~~$x$~~   $= \{HH, HT, TH, TT\}$

Value Random  $\rightarrow$

ex - Throwing a dice



$$x = \{1, 2, 3, 4, 5, 6\}$$

$\rightarrow$  Two Type of Random Variable

① Continuous

Age = 2.5, 39.46  $x = \{0 \text{ to } 100\}$   
Weight, Height, BP,

② Discrete

Rolling NO

$$x = \{1, 2, 3, 4, 5, 6\}$$

# Probability Distribution

It is a list of all possible outcomes of a random variable along with their corresponding probability.

ex = Distribution of Tossing a Coin

outcome	H	T
probability	$\frac{1}{2}$	$\frac{1}{2}$

ex = Distribution of Throwing a Dice

[illegible]

## eg = Throwing a Dice (Twice)

Dice 1 →		1	2	3	4	5	6
Dice 2 ↓	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

$$P(2) = \frac{1}{36} \quad P(3) = \frac{2}{36} \quad P(4) = \frac{3}{36} \quad P(5) = \frac{4}{36}$$

$$P(6) = \frac{5}{36} \quad P(7) = \frac{6}{36} \quad P(8) = \frac{5}{36}$$

$$P(9) = \frac{4}{36} \quad P(10) = \frac{3}{36} \quad P(11) = \frac{2}{36}$$

$$P(12) = \frac{1}{36}$$

### Probability Distribution Function

It is a mathematical expression that describes the probability of different possible outcomes for an experiment.

$$y = f(x) = y = \begin{cases} \frac{1}{6}, & \text{if } x \in \{1, 2, 3, 4, 5, 6\} \\ 0, & \text{otherwise.} \end{cases}$$

