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ARIMA - LSTM Hybrid Stock Prediction Model

Assignment : 1

Q1. a.) Two events are mutually exclusive if they cannot occur at the same time.
⇒ $P(A \cap B) = 0$

A and B - mutually exclusive : The stock price cannot increase by 10% & decrease by 5% at the same time.

A and C - mutually exclusive : The price cannot increase by 10% and also increase or decrease by less than 10% at the same time.

B and C - They overlap in 5% - 10% range.

b.) Mutually Exhaustive - at least one of them must occur
⇒ $P(A \cup B \cup C) = 1$
$P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(A \cap C) = 1$
(the last two terms are 0)
⇒ $P(A) + P(B) + P(C) = 1 + P(B \cap C)$
$\therefore P(A) + P(B) + P(C) > 1$
$\because P(B \cap C)$ is not mutually exclusive, $P(B \cap C) \neq 0$

c.) D : Major Economic report is released that day.

A & D are independent :- major report cannot predict for increase of 10% of stock price

$\Rightarrow P(A \cap D) = P(A) \times P(D)$ { If A and D are independent }

$\therefore P(A|D) = \frac{P(A \cap D)}{P(D)} = \frac{P(A) \times P(D)}{P(D)}$

$\therefore P(A|D) = P(A)$