- Experiment are the uncertain situations which could have multiple outcomes.
- Outcome is the result of single trial.
- Event is one or more outcome from an experiment.
- Probability is a measure of likelihood of an event.
- Mutually exclusive events:
  → Two events are mutually exclusive if they can't occur at the same time.
  → ex- Tossing of coin.
- Non mutual exclusive events:
  → Two events are non mutual exclusive if they can occur at same time.
  → ex- picking heart and King from deck.
- Dependent events:
  → Two events are dependent if they affect occurence of each other.
  → ex- If bag has 5R, 5B balls then, picking a red ball has probability of $P(R) = 5/10$ now if again we pick red probability is $P(R) = 5/9$.
- Independent events:
  → Two events are independent if they dont affect occurence of each other.
  → ex- In prev example if we put ball back in bag after picking probability remain same.

* Addition Law of probability.

- For mutually exclusive events:

$$\boxed{P(A \text{ or } B) = P(A) + P(B)}$$

- For non- mutual exclusive events:

$$\boxed{P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)}$$

* Multiplication Law of probability

- For Dependent events:

$$\boxed{P(A \text{ and } B) = P(A) * P(B/A)}$$

Conditional probability

- For Independent events:

$$\boxed{P(A \text{ and } B) = P(A) * P(B)}$$

* Naive Bayes theorem:

- Its basically conditional probability for mutually exlusive events.
- If $A_1, A_2, \ldots A_n$ are mutually exclusive events with $P(A_i) \neq 0$ $(i = 0, 1, \cdots n)$ of random experiment then for an arbitary event B of the sample space of above experiment, $P(B) > 0$.

$$\boxed{P(A_i/B) = \frac{P(A_i)\, P(B/A_i)}{\sum_{i=1}^{n} P(A_i)\, P(B/A_i)}}$$

* Odds in favour and against event

m = number of favourable events (ways)
n = number of non-favourable events

$$\boxed{Odds_{Favour} = m/n}$$

$$\boxed{Odds_{Against} = n/m}$$