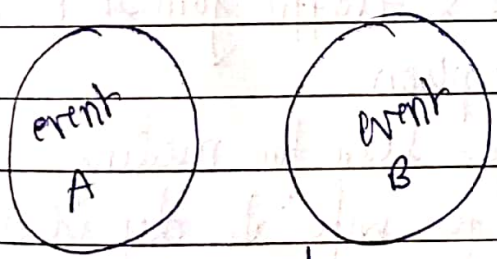
29th February 2020

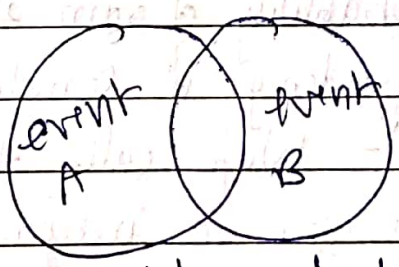
Probability of single and more events.

Single event
a) Probability of 6 on die
b) Probability of sum '6' for 2 dies

Multiple event
a) Probability of getting 3 in first 2 die throw & 1 in second die
b) Probability of getting spade and ace while picking 2 cards



Mutually exclusive



Not mutually exclusive

Example for mutually exclusive

Event 1 - Probability of 9AM - 12PM in USA right now -
Event 2 - Probability of 9AM - 12PM in India right now

Example for mutualy inclusive / mutually not exclusive

Event 1 Probability of event of traffic at ABC street.
Event 2 Probability event of rain at DEF nagar.

* Dependent and Independent events.

1) Dependent - has a cause effect & drinking coffee because it is raining

$P(A) + P(B) - P(A \cap B)$

Mutually not exclusive

$P(A) + P(B)$ - Mutually exclusive

2) Independent events.
Probability of rain in Hyderabad & traffic jam in Bangalore
Dependency is sometimes a perception
Eg - Wife calls just before you leave for meeting
For you its independent event, for wife its dependent events.

Union - exclusiveness
Intersection - dependency.

Dependency and exclusiveness.
Dependency is more logical - it cannot be put on paper
Exclusiveness is mathematical - it can be shown on paper

1) Independent events.
   a) $P(A \cap B) = P(A) * P(B)$
   b) $P(B|A) = P(B)$
      ↳ P(Kid drinking milk | milk is given to him)
      = P(Kid drinking milk)
   Kid will drink milk once it is kept in front of him, the probability won't come into picture if the milk is not kept.

2) Dependent events.
   a) $P(A \cap B) = P(A) * P(B|A)$
      ↳ Here B event is dependent of A happening.
      P(Getting into final round given you clear technical round)
   If technical round is not cleared, you cannot proceed to final round.

3) What is probability of not getting '1' on 1st & 2nd throw of die

→ $\frac{5}{6} \times \frac{5}{6} = \frac{25}{36}$.

IMP - Influence → whether one event influences other should be seen.

8) There is a drawer with 15 green, 12 blue and 16 yellow. Task is to go on picking balls and place them in a bag till you get a pair of balls of same colour in your bag.

→ 4 → G R Y (G/B)

9) What should the coach do? go for 2 point or 3 point?
A basket ball team is down by 2 points.
Chance of 2 point shot = 50%
Chance of winning in overtime = 50%
Chance of making 3 point shot to win = 30%.

→ Chance of 2 point → $\frac{1}{2}$

Chance of wining in overtime - $\frac{1}{2}$

i.e $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4} = 0.25$

Chance of wining with 3 pointer - 30% or 0.3
hence go with 3 pointer