Probability II (2nd Lesson)

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(Samdom For Peace)

Events

- In this second chapter of Probability, we shall discuss events. There are four types of events namely:
- Independent Event
- Dependent Event
- Mutually Exclusive Event
- Complimentary Event

Independent Events

- Two events are said to be independent if the probability of one event does not affect the probability of the other event.
- We notice these events in the conditions of “with replacement” clause in the question
- Example:

  Let’s say I have 10 marbles in a box: 4 green, 2 blue and 4 red marbles. I picked a marble (1^{st} event) and then replaced it. I then picked another marble (2^{nd} event). What type of events are they?

Answer

- My two events are independent because I replaced the first marble that I picked. The 2nd event is just similar to the 1st event and is independent of it because 10 marbles will still be in the bag before I make my pick.
- What do I mean?
- Before I made my 1st pick, 10 marbles were in the bag.
- I made my first pick and replaced it leaving the number of marbles to be 10
- Before I made my 2nd pick, 10 marbles still remained in the bag.
- Therefore, the events are independent of each other.

Dependent Events

- Two events are said to be dependent if the probability of one event affects the probability of the other event.
- We notice these events in the conditions of "without replacement" clause in the question
- Example:

  Let's say I have 10 marbles in a box: 4 green, 2 blue and 4 red marbles. I picked a marble (1^{st} event) and did not replace it. I then picked another marble (2^{nd} event). What type of events are they?

Answer

- My two events are dependent because I did not replace the first marble that I picked. The 2^{nd} event is not similar to the 1^{st} event and is dependent on it because 9 marbles will be in the bag before I make my 2^{nd} pick. It ran short of 1 marble as I did not replace it.
- What do I mean?
- Before I made my 1st pick, 10 marbles were in the bag.
- I made my first pick and did not replace it leaving the number of marbles to be 9
- Before I made my 2^{nd} pick, 9 marbles will be in the bag.
- Therefore, the 2^{nd} event depends on the 1^{st} event.
- Do you understand that? Lets do some problems.

Complimentary Events

- An event is said to be the compliment or prime of another event if the sum of their probabilities is equal to one (1).
- In simple English, I will say that complimentary events are opposite of the main events or the events in question.
- Example:
- If the probability that Joy will dance is ¼, find the probability that Joy will not dance, OR find the complement.

Answer

- The event that Joy will not dance is the complimentary event that Joy will dance.
- Therefore,
- P(J will dance) + P(J will not dance) = 1
- So, P(J will not dance) = 1 – P(J will dance)

  = 1 – ¾

  = ¼

Mutually Exclusive Events

- Two events are said to be mutually exclusive if they cannot occur at the same time. OR if they cannot occur simultaneously.
- Example:
- The events of getting a Head and a Tail in a single toss of a fair coin are mutually exclusive. When you toss a coin one time, you either get a Head or a Tail. You cannot get both at the same time.

Laws of Probability

- Addition Law: usually goes with “OR”
- Multiplication Law: usually goes with “AND”

- We have to stop here for your level.
- Lets do more problems
- Ask your questions
- Be good. Take care.