Multiplication Rule (For independent and dependent events):

Two events are independent if they do not affect one another.

Example: Tossing a coin. If we toss the coin the first time and get heads. It won’t affect the outcome the second time. The odds of getting a tail or head will still be 50%.

Two events are dependent if and only if they affect each other.

Example: Take a king card from the deck, and the queen card from the deck.

This is a dependent event as initially there we 52 cards, after taking out the king card, the total number of cards in the deck became 51.

P(K) = 4/52

After taking out the King’s card

P(Q) = 4/51

Formula:  
For Independent events:

P(H and T) = P(H) \* P(T) = ½ \* ½ = ¼

For Dependent events:

P(K and Q) = P(K) \* P(Q/K) <- Probability of getting Q given K has been taken out

= 4/52 \* 4/51 = 4/663

This formula is called Baye’s theorem or Conditional Probability.

Also used in ML Naïve Baye’ algorithm.