**Probability of independent events**

1. Definition of probability

* Probability is the likelihood of something happening in the future(chances of something to happen)
* It is expressed as a number between 0 and 1

Formula:

**Probability = #of wanted outcomes/#of possible outcomes**

e.g. What is the probability to get a 6 when rolling a dice

#of wanted outcomes/#of possible outcomes= 1/6

1. Definition of dependent events

* Two events are dependent if the outcome or occurrence of the first event affects the outcome of the second so the probability is changed

e.g. A card is chosen at random from a standard deck of 52 cards. Without replacing it a second card is chosen. What is the probability that the first card chosen is a queen and the second card chosen is jack?

P(queen)=4/52

P(jack)=4/51

**P(queen and jack)= 4/52\*4/51 = 16/2 652 = 4/663**

* Why these events are dependent?

The # of outcomes decreases after the first pick

1. Probability of Independent events

3.1 Definition of independent events

- Two events A and B are independent if the occurrence of event A does not affect the occurrence of event B

**Formula:**

**P(AB)=P(A)\*P(B)**

e.g. What is the probability of getting heads on both flips of the coin?

P(H)=1/2 P(T)=1/2

***HH Formula:***

HT

TH P(H)\*P(H)=1/2\*1/2=1/4

TT

3.2 Why these events are independent?

- The first flip of the coin in no way influences the outcome of the second flip.

The probability of getting heads in the both flips is the same.

e.g. What is the probability of getting 4 heads in a row?

1/2 \* 1/2\* 1/2 \* 1/2 = **1/16**

* Given that we have just got 4 heads in a row, what is the probability of the next flip being head?

**1/2** The previous 4 flips don’t affect the outcome of the 5th flip

e.g. Your friend invites you to a movie, saying it starts some time on the weekend between 4 in the afternoon and midnight, but won’t say more. What are the chances(probability) it starts on Saturday between 6 and 8 at night?

P(Saturday)=1/2

P(between 6-8)=2/8=1/4

**P(Saturday, between 6-8) = P(day)\*P(time) = 1/2\*1/4=1/8**