Odds and Expectation

STATISTICS

2 ways of stat:

- Frequentist [mostly used]
- Bayesian [good for uncertainty]

Probability range: (0 to 1)

∪ → or → union

∩ → and → intersection.

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

Odds:

→ odds is another way of expressing probability

→ it means how many times it will happen vs will not happen.

Example:

A : an event (eg: getting "6" in a die

P(A) : probability of A

$P(A^c)$: The event does not happen

O(A) : odds of A

*** $O(A) = P(A) / P(A^c)$

$= \frac{1/6}{5/6} = \frac{1}{6} \times \frac{6}{5} = \frac{1}{5} =$ 1:5 or 5:1

1 time it will happen
5 " " " not "

means

Expectation: $E(X) = \sum_{i=1}^{n} x_i \cdot P(X = x_i)$

→ Calculate expected value of 6-sided dice:

$E(X) = \sum_{i=1}^{n} x_i \cdot P(X = x_i) = \sum_{i=1}^{n} i \cdot \frac{1}{6}$

$P(X = x_i)$ → 1/6

$i = 1$ to n → 1, 2 ... 6

$= \frac{1}{6}(1+2+3+4+5+6) = 3.5$

means the more you roll, the avg. value will be around 3.5