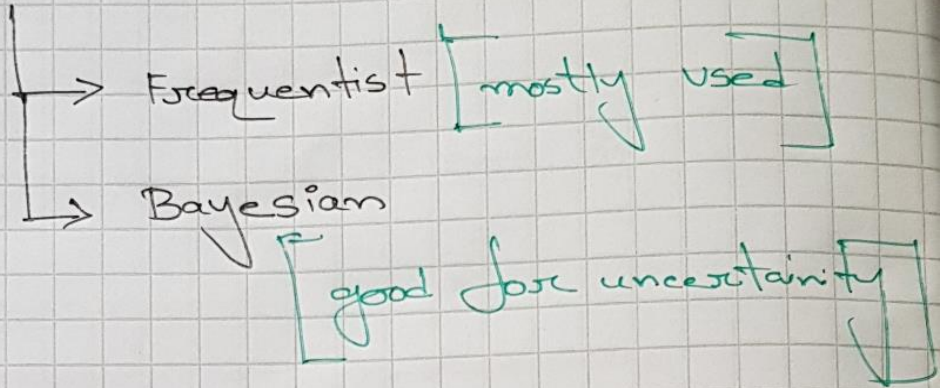


Odds and Expectation

< STATISTICS >

2 ways of stat:



Probability range: (0 to 1)

\cup \rightarrow OR \rightarrow union

\cap \rightarrow and \rightarrow intersection

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

Odds:

\rightarrow odds is another way of expressing probability

\rightarrow 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

$$*** O(A) = \frac{P(A)}{P(A^c)}$$

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

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:

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

\downarrow \downarrow
 $\frac{1}{6}$ $1, 2, \dots, 6$

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

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