Naive Bayes

CSK

toss	venue	Outlook	Result
won	Mumbai	Overcast	Won
lost	Chennai	Sunny	Won
won	Kolkata	Sunny	Won
won	Chennai	Sunny	Won
lost	Mumbai	Sunny	Lost
Won	Chennai	Overcast	Lost
won	Kolkata	Overcast	Lost
Won	Mumbai	Sunny	Won

$\{lost, Mumbai, sunny\}$

we can write $\{lost \cap Mumbai \cap sunny\}$

assume that it is C

now, we will find,

$P(W|C)$

$P(L|C)$

If the $P(W|C)$ is greater than $P(L|C)$ then we can say the will win the match.

Now,

according to Bayes theorem,

$$P(W|C) = \frac{P(C|W)\,P(W)}{P(C)}$$

$$P(L|C) = \frac{P(C|L)\,P(L)}{P(C)}$$

same

so, we can remove that

From chart,

$$P(W) = \frac{5}{8}$$

$$P(L) = \frac{3}{8}$$

Now how we can find $P(C|W)$.

There is no such event. So, we will simplify it to.

$$P(\text{lost}, \text{mumbai}, \text{sunny} \mid W) P(W)$$

$$P(\text{lost} \mid W) P(\text{mumbai} \mid W) P(\text{sunny} \mid W) P(W)$$

$$\Rightarrow \frac{1}{5} \times \frac{2}{5} \times \frac{4}{5} \times \frac{5}{8}$$