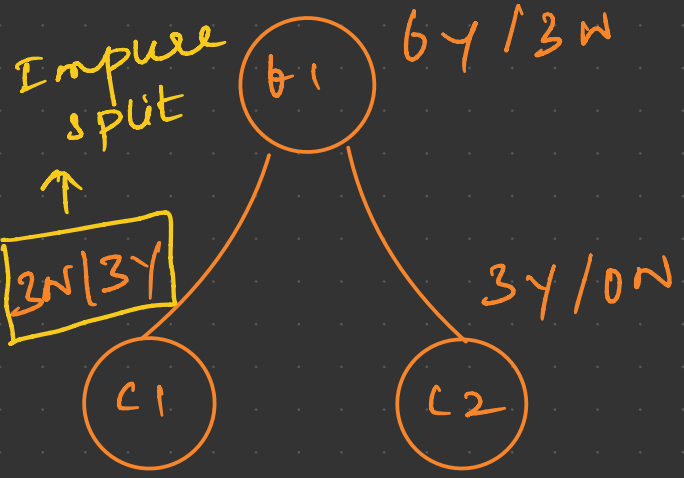
Entropy

$$H(S) = -P_+ \log_2 P_+ - P_- \log_2 P_-$$

P_+ : Probability of one category

P_- : Probability of other category.



$$H(C_1) = -P_+ \log_2 P_+ - P_- \log_2 P_-$$

$$= -3/6 + \log_2 3/6 - 3/6 - \log_2 3/6$$

$$= 1 \Rightarrow \text{Impure split}$$

Gini Impurity

$$GI = 1 - \sum_{i=1}^{n} (P)^2$$

$$= 1 - ((P_+)^2 + (P_-)^2)$$

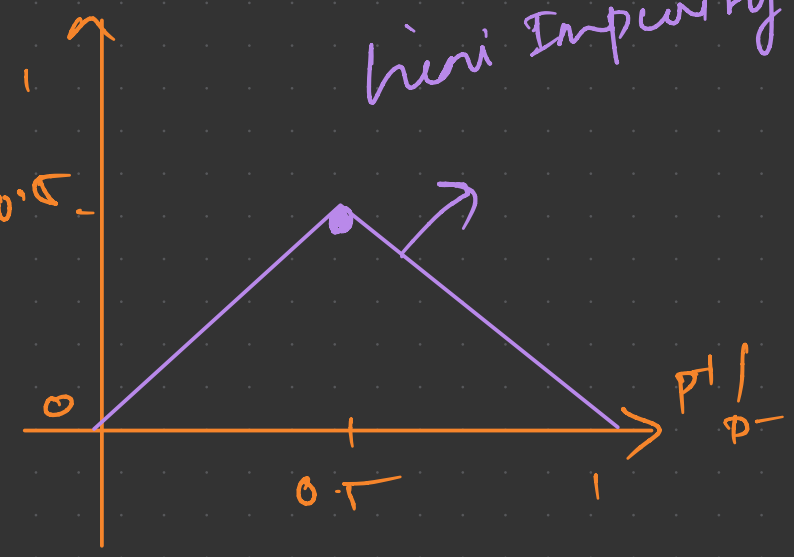
P_+ : Probability of one category

P_- : Probability of other category.

$$= 1 - \left[(3/6)^2 + (3/6)^2 \right]$$

$$= 1 - \left((1/2)^2 + (1/2)^2 \right)$$

$$= 0.5 \Rightarrow \text{Impure}$$

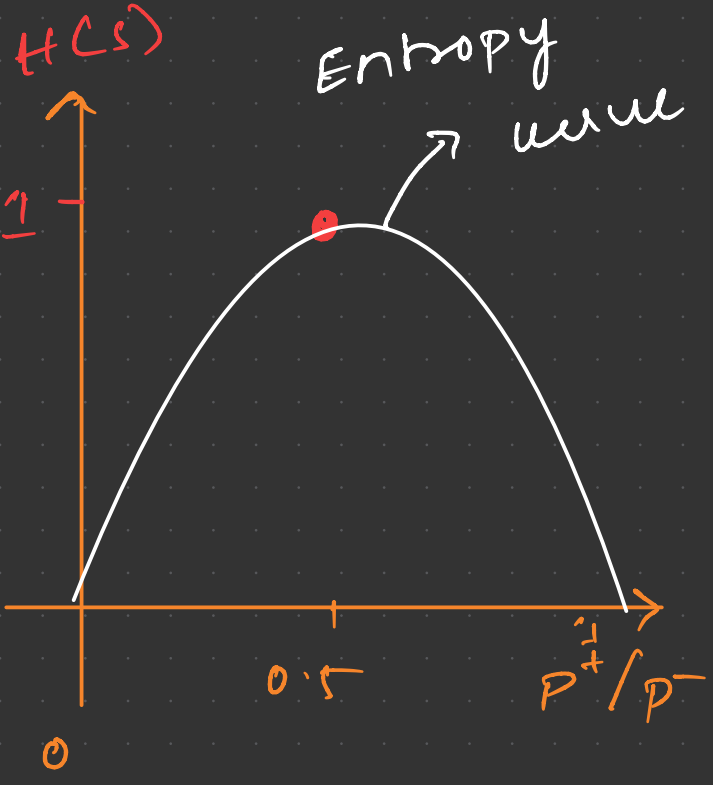


Entropy

$H(C_2) = -3/3 \log_2 3/3 - 0 \log_2 0$

$= -1 \log_2 1$

$= 0 \Rightarrow$ pure split



the values will be always between 0's and 1

Gini Impurity

In case of Gini Impurity the values will be ranging from 0 to 0.5.