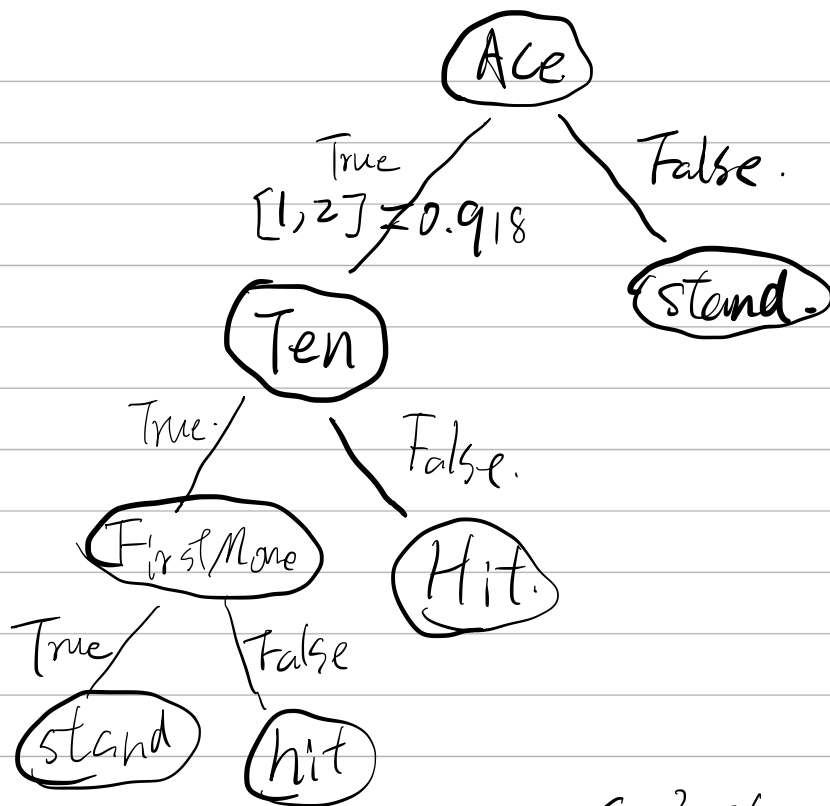


1.



$$\text{Gain}(\text{Ten}) = 0.918 - \sum_{T,F} \frac{2}{3} E\left(\frac{1}{2}, \frac{1}{2}\right) + \frac{1}{3} E(0,1)$$

$$= 0.918 - 0.667 = 0.251$$

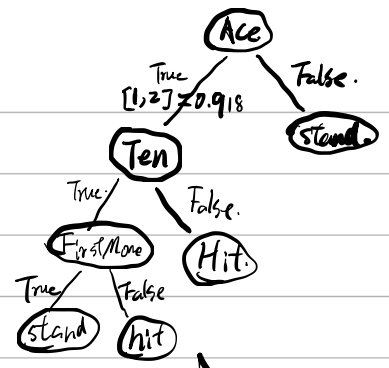
$$\begin{aligned} \text{Gain}(\text{First Move}) &= 0.918 - \sum_{T,F} \frac{2}{3} E\left(\frac{1}{2}, \frac{1}{2}\right) + \frac{1}{3} E(0,1) \\ &= 0.251 \end{aligned}$$

so, This not tree optimal.

2.  $\text{play} = \text{Hit}:$

$(\text{Ace} = \text{True} \wedge \text{Ten} = \text{False}) \checkmark$

$(\text{Ace} = \text{True} \wedge \text{Ten} = \text{True} \wedge \text{First Move} = \text{False})$



3. Greedy Alg. means don't need to get all optimal choice. Which make decision tree inexpensive and faster.

4. In majority classifier. Testing data is Pos or Neg which make Training data 99 Pos 100 Neg or 100 Pos 99 Neg. This make Accur. always be 0%.

$$\text{total Acc} = \frac{\sum \text{Acc}}{|\text{Acc}|}$$