SESSION PLAN

Session Name	Decision Tree

Learning Outcomes

- Learn the intuition behind a decision tree
- Learn how to build a decision tree
- Understand the concepts of entropy
- Know how to avoid overfitting a decision tree

Prerequisites for the Student ● Decision Tree - Go through the concept and solve the tasks and assessments.	

Student Activities

- Discuss with the Mentor what you have learned.
- Overview of Decision Tree
  - Splitting criterion - Entropy/Information Gain, Gini, Chi-square
- Below is the pic of the dataset, you have to create a decision tree based on this data

Age	Competition	Type	Profit
Old	yes	software	down
Old	no	software	down
Old	no	hardware	down
Mid	yes	software	down
Mid	yes	hardware	down
Mid	no	hardware	high
Mid	no	software	high
new	yes	software	high
new	no	hardware	high
new	no	software	high

  - Calculate the entropy for the class(i.e Profit) and calculate the gain for each attribute (i.e Age, Competition and Type)
  - For each attribute find Information gain and Entropy of each attribute
  - Then calculate gain of each attribute(i.e you can calculate by using Entropy(class) - Entropy(attribute))
  - And based on gain draw the decision tree.
- Good blog on a decision tree.
  https://medium.com/deep-math-machine-learning-ai/chapter-4-decision-trees-algorithms-b93975f7a1f1
- Practice problem on Decision Tree
  - Refer the GitHub repo for problems
- Quiz on Decision Tree.
- Code Along
- Questions and Discussion on doubts - AMA

Next Session

- Concept - Ensembling, Random Forest & Gradient Boosting Machines
- Key topics to be highlighted - highlight where they would need to spend more time and importance w.r.t Data Science.
  - Intuition behind ensembling
  - Soft vs Hard Voting
  - Stacking
  - Random Forest
  - Hyperparameter Tuning
  - Intuition of Boosting
  - Adaboost
  - Gradient Boosting
  - XGBoost