1. **What is the estimated depth of a Decision Tree trained (unrestricted) on a one million instance training set?**

**-** The estimated depth of a Decision Tree trained on a one million instance training set can be quite deep, depending on the complexity of the data and the number of features. In unrestricted cases, the tree can grow deep enough to reach individual instances, resulting in a depth close to the number of instances in the training set. However, there's no fixed depth, and it varies based on the specific dataset and its characteristics. Regularization techniques like pruning can control the depth and prevent overfitting.

1. **Explain if its a good idea to try scaling the input features if a Decision Tree underfits the training set?**

* Scaling input features is generally not recommended for Decision Trees if the model is underfitting the training set. Decision Trees are inherently insensitive to the scale of features, and underfitting is usually due to the tree's simplicity or lack of depth. To address underfitting, consider other approaches such as increasing the tree's depth, reducing regularization, or adding more features. Scaling features is more relevant for algorithms like SVM or k-Nearest Neighbors, which are sensitive to feature scales.

1. **How much time will it take to train another Decision Tree on a training set of 10 million instances if it takes an hour to train a Decision Tree on a training set with 1 million instances?**

* The time it takes to train a Decision Tree is often not linearly proportional to the number of instances. It can vary significantly depending on factors like the dataset's complexity, the machine's computational power, and the specific algorithm or library used. Therefore, it's challenging to predict the exact time, but it's likely to be more than 10 hours, possibly significantly more, when training on a 10 million instance dataset compared to 1 million instances.