

3 Q4: Can a model have high accuracy but still perform poorly? Explain. [3 marks]

~~Yes, it can do this due to overfitting. A model can be trained to identify every single training element of the~~

Yes, it can do this due to overfitting. A model can identify every the whole training dataset correctly but it would not generalize ^{its algorithm}, leading to it performing poorly in the test dataset.

1 Q6: Why is a complex model more prone to overfitting? [3 marks]

This is because there are more layers of neurons in the model so the model learns better than simpler models. In doing this, high variance and low bias may occur, making vulnerable to overfitting than underfitting (low variance, high bias).

2 Q10: How does pruning improve the performance of a Decision Tree? [3 marks]

There are two ways it does. One is during pre-pruning where the decision tree is stopped if it does not hit a certain threshold. In post-pruning, the decision tree which are not required. Pruning cuts off the branches of the decision trees, cutting off those if a certain feature does not hit a certain threshold. It improves the robustness and performance of the tree. Through post and pre-pruning, it improves the tree.

Applied Machine Learning

Quiz 1

Date: Feb 10th 2025

Course Instructor(s)

Ms. Anosha Khan

Total Time (Min): 30

Total Marks: 15

Total Questions: 5

Roll No

Section

Student Signature

Answer the Following Questions. Write short and to the point. Not more than 2 to 3 Lines

2 Q1: What is the difference between supervised and unsupervised learning? [3 marks]

Supervised learning is when data which is labelled is given to a model to train it on identifying labels. Unsupervised learning is when data not labelled is given to a model and the model has to learn on its own. When a model has to be trained to label data which is not labelled beforehand.

↓
On what basis?

3 Q3: What is the difference between Decision Trees and Random Forests? [3 marks]

~~Decision Trees~~

Decision Trees split a dataset based on certain conditions. Random forests is an ensemble of multiple decision trees and their learnings are averaged. Random forests are less prone to overfitting than decision trees.