



IIT KHARAGPUR AI4ICPS I HUB FOUNDATION

Hands-on Approach to AI, Cohort-2, July – October 2024

Assignment 5: Decision Tree, Random Forest

Due date: Friday 16th August 2024, EOD – IST.

Important Instructions for submitting solutions

1. Submit the solution to all questions in the assignment should be submitted in a **single PDF file with not more than 500 words**.
2. Any plagiarism if detected will automatically attract **zero marks** for that assignment.
3. It is preferable if the **text of PDF file can be extracted** through a PDF extractor e.g. PyPDF. For example, pictures of handwritten text are not extractable, whereas PDF generated by MS Word, Latex, etc., are.
4. Exceptionally good solutions with extractable text may receive **special appreciation** from the teachers.

Questions

1. What is a Decision Tree, and how does it make decisions during test time?
2. How does Bagging improve the performance of a Decision Tree?
3. In what situations might a Decision Tree overfit the training data, and how can this be mitigated?
4. How does Random Forest differ from a single Decision Tree?
5. What is the main idea behind Boosting in ensemble methods?