Explainable AI – Exercise Sheet 2
October 28th, 2024

Exercise 1 -   Theoretical Exercise

1. Suppose we want to predict whether a person will buy a product based on their age, income, and whether they have previously purchased a similar product.

Age	Income	Previous Purchase	Buy Product
Young	High	No	No
Young	Low	Yes	Yes
Young	Medium	Yes	Yes
Middle	High	No	Yes
Middle	Medium	No	No
Middle	Low	Yes	Yes
Old	Low	No	No
Old	Medium	Yes	Yes
Old	High	No	No

Apply ID3 and build up the decision tree, reporting the information gain at each split.

2. When should one not use a linear model? provide an example.

3. In slides pages 10 and 11 about Lasso Regression, the loss function "forces" the model to use as few features as possible. Explain the intuition behind the loss function, how it achieves this, and which part of the loss function is responsible for it. Similarly, explain Ridge Regression and the second term of its loss function.

4. Describe trepan in your own words. What is the difference between accuracy and fidelity, and what is the correlation between them?

5. Does trepan generate the data before training the model or during training? Name one advantage in each case?

6. Describe soft decision trees in your own words. Why are they called soft?

Exercise 2 -   Practical Exercise

7. Details in the notebook file