# INTRODUCTION TO MACHINE LEARNING

## Project:- Decision Tree Grafting

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# DECISION TREE GRAFTING

- Adds nodes to inferred decision tree as a post-process.
- It tries to increase the prediction accuracy.
- It uses global information.
- The important algorithms implementing this idea are C4.5x and C4.5+.
- It finds the best suited cuts of existing leaf regions and branches out to create new leaves with other classifications than the original.

# ALGORITHM AND ITS APPLICATION

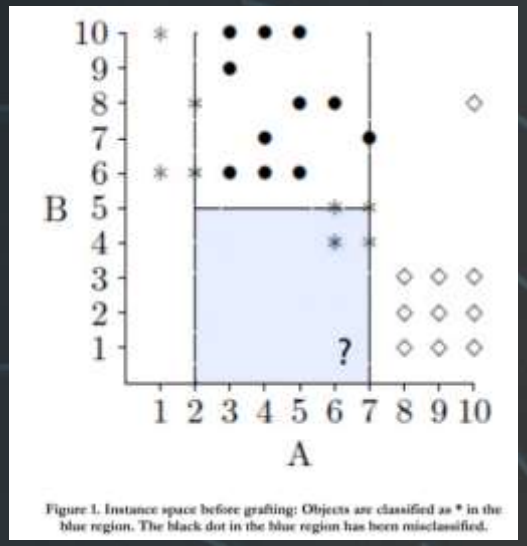

Figure 1. Instance space before grafting: Objects are classified as * in the blue region. The black dot in the blue region has been misclassified.

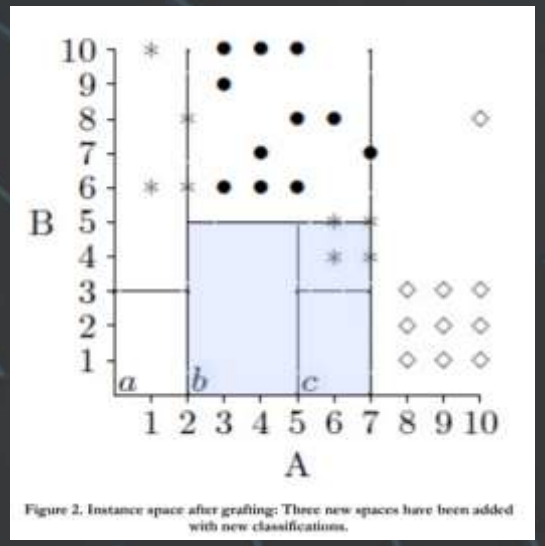

Figure 2. Instance space after grafting: Three new spaces have been added with new classifications.

- To which class the "?" belongs in the figure 1 ?
- **Application and advantage**
- It will increase the complexity of the tree, but most significantly reduce the prediction error of the tree.
- The main moto of the Webb's grafting research was to examine the effect of complexity on prediction accuracy.