

This task is an in-class exercise, done during the time in the class. Dependent on the progress we will discuss individual results from students. Students are encouraged to present their results during the session leading into a positive participation. No submission of the individual solutions is necessary.

Decision Tree

In this example, you are going to have a more hands-on oriented view on to the example from the theoretical input: the Play Tennis example! Given is the dataset in Table 1.

With this exercise, start completely from scratch, using a python script. The dataset can be downloaded from [here](#).

Day	Outlook	Temperature	Play
1	sunny	hot	No
2	sunny	hot	No
3	overcast	hot	Yes
4	rain	mild	Yes
5	rain	cool	Yes
6	rain	cool	No
7	overcast	cool	Yes
8	sunny	mild	No
9	sunny	cool	Yes
10	rain	mild	Yes
11	sunny	mild	Yes
12	overcast	mild	Yes
13	overcast	hot	Yes
14	rain	mild	No

Table 1: Play-Tennis Example from the Slides

For this task, you are free to choose all the components. However, scikit-learn is highly recommended.

Task 1 Build up your setup: Read in the data appropriately and train a Decision Tree Classifier.

Task 2 Visualize this Decision Tree.

- What do you read in all leaves?
- What differences do you see to how we calculated the Decision Tree by hand?

Task 3 Adapt the Decision Tree, so it matches how we calculated the Decision Tree.

Task 4 Regularize the Decision Tree: one of the regularization techniques is to define a maximum depth. Do so and observe the changes.