Machine Learning (WiSe 2025/2026)

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Assignment 4 Task 4.2

According to the task description our Decision tree should classify based on "Good", "Neutral", "Bad".
They are evaluated on the following features/attributes:

- chores (All, Most, Few, None)
- noisy (1 to 10)
- mess (Yes or No)
- treament of others (Nice, Mean, No Interaction)

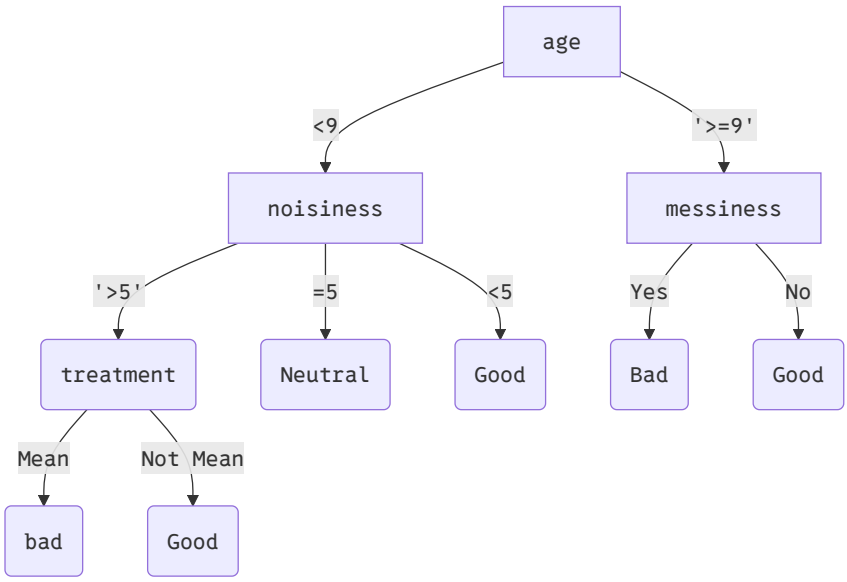
Other information about the childer is also given, like: name, birth date, supervisor, parental income.
The task also tells us that the classification of the child mostly depends on their age, noisiness and treament of others.
It is also mentioned that some supervisors grade children worse than others, meaning that there is some bias present.

Setting up a table to reflect the data for a class of 5 students would look like the following:

name	birth date	supervisor	parental income	chores	noisiness	messiness	treatment of others	behavior
John	2016	Mr. Adam	10,000	All	5	No	Nice	Good
Alice	2015	Mrs. Merkel	12,000	Most	3	No	Nice	Good
James	2017	Mrs. Merkel	11,000	Few	7	Yes	No Interaction	Bad
Jack	2015	Mr. Adam	16,000	Few	2	Yes	Mean	Bad
Lily	2016	Mr. Adam	10,000	None	6	No	Nice	Neutral

Now assuming that between Mr. Adam and Mrs. Merkel, Mr. Adam is a harsher judge of the children, i.e. he rates every child one
level worse than their natural classification. For example If John would have been classified as Neutral, Mr. Adam would classify
him as Bad instead.

Here's what a supposed decision tree would look like:



The possible challenges here would include consideration of the bias of supervisors. Though the given tree doesn't require
the supervisor as a node, it is undeniable that children under Mr. Adam have received lower behavior classification.
Another possible problem could be trying to adjust too much for a given feature like age, seeing has how older children fared worse than younger children.