Decision Tree

How to avoid overfitting

Low pressure	High Temperature	High humidity	Wind Speed	Rain
No	No	No	10.0	No
Yes	Yes	Yes	30.0	Yes
Yes	Yes	No	20.0	No
Yes	No	Yes	50.0	No
No	No	Yes	70.0	Yes

No

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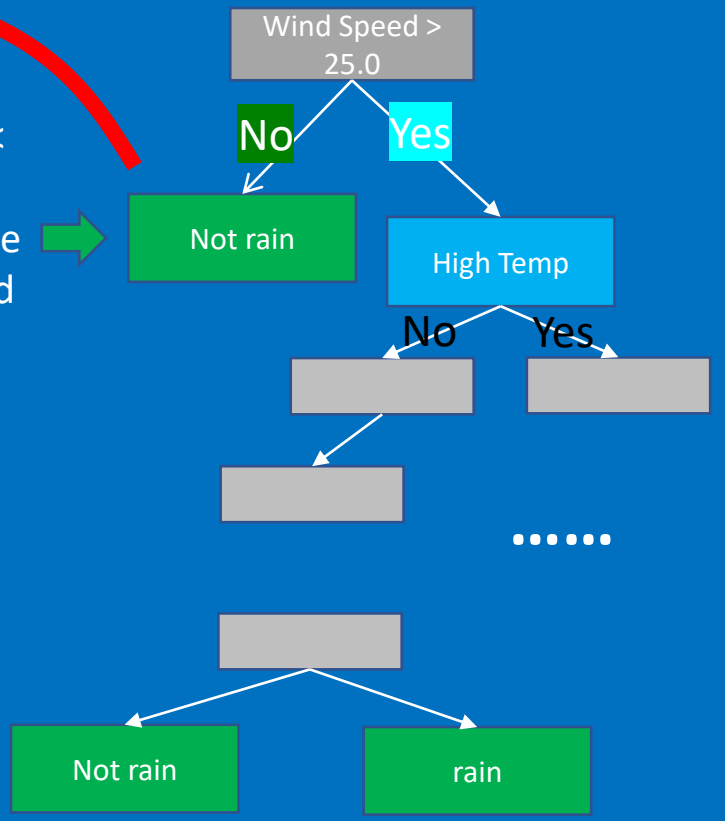
In this example, if we start from root with “wind speed < 25.0”, there is only one “no-rain” sample for us to use. The model can be easily overfitted



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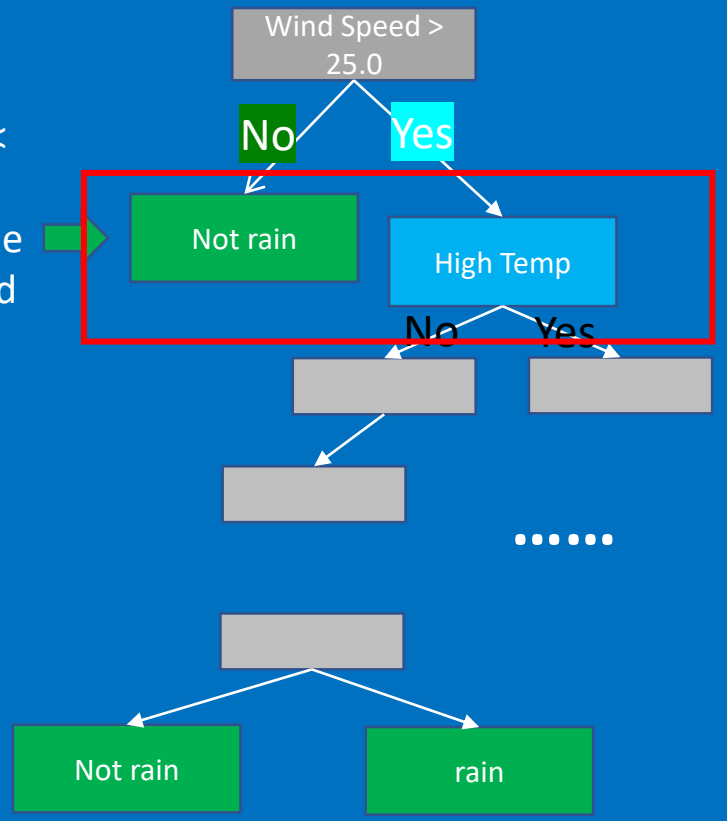

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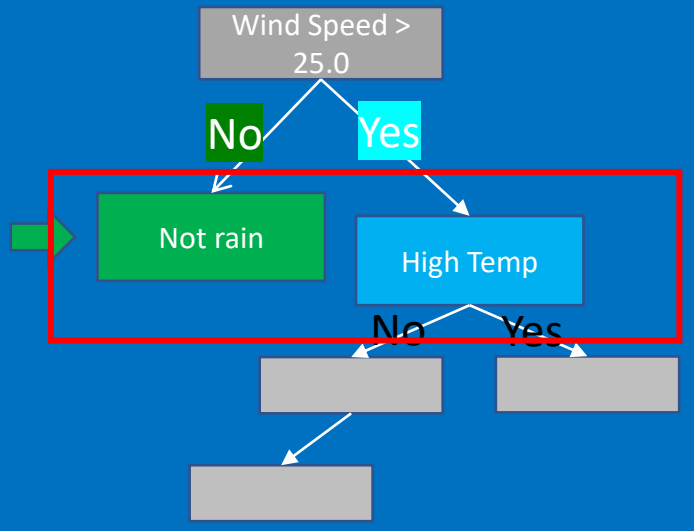
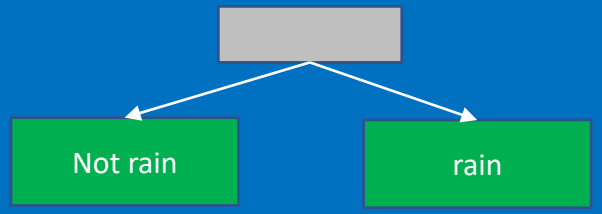
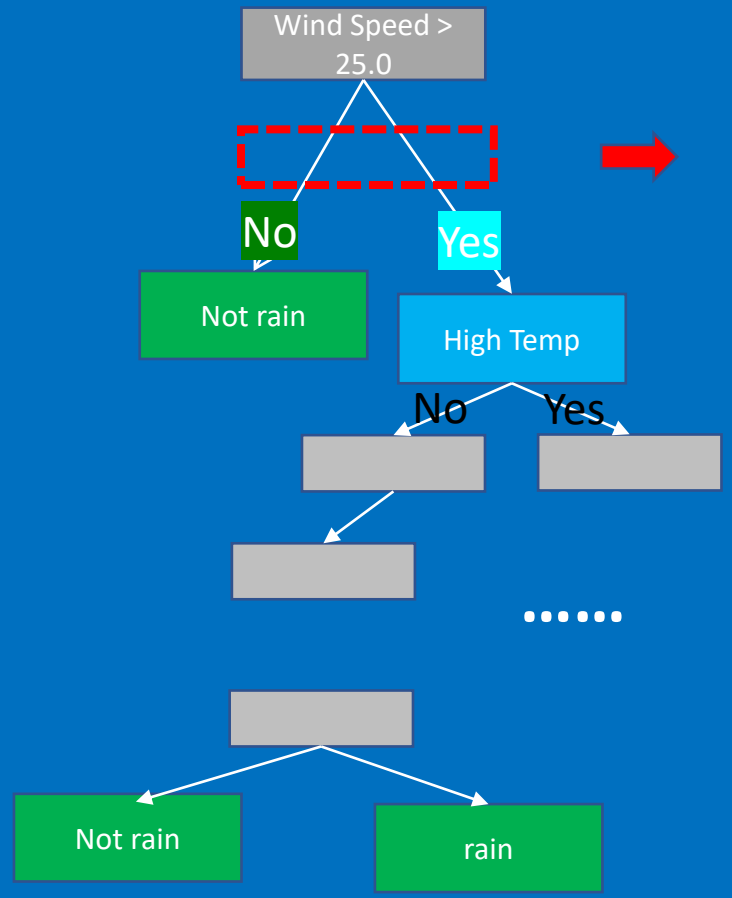


In order to address this, we can limit how deep (how many levels) the decision tree want to go. For example, if we can require it must have at least 4 samples in the level for the tree to grow





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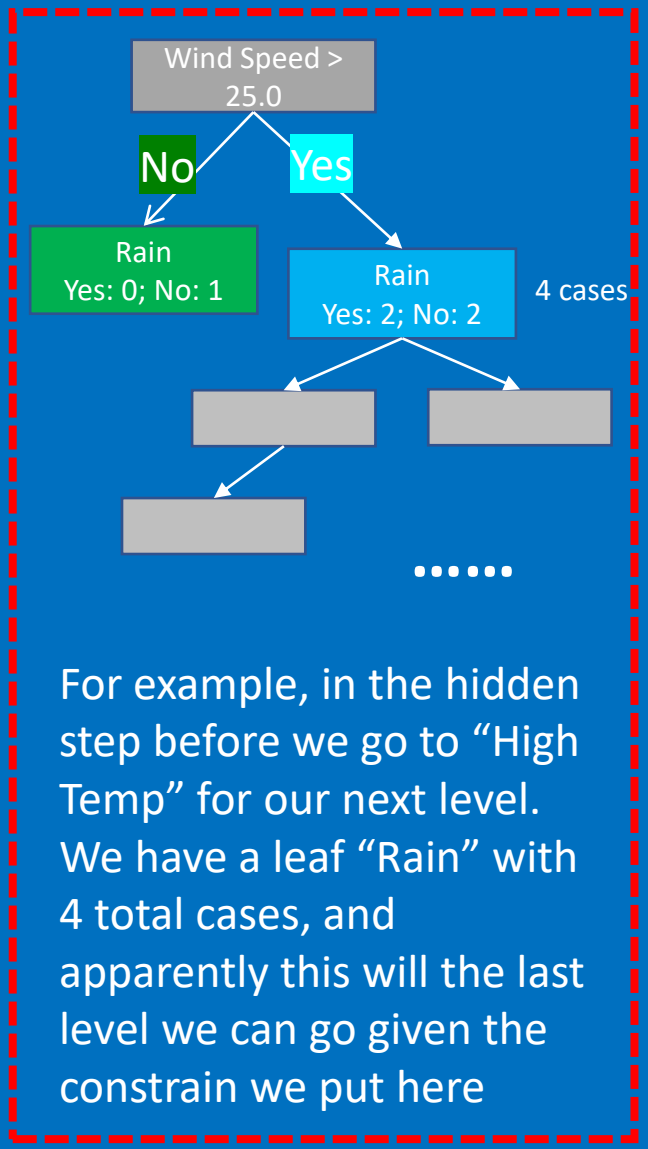
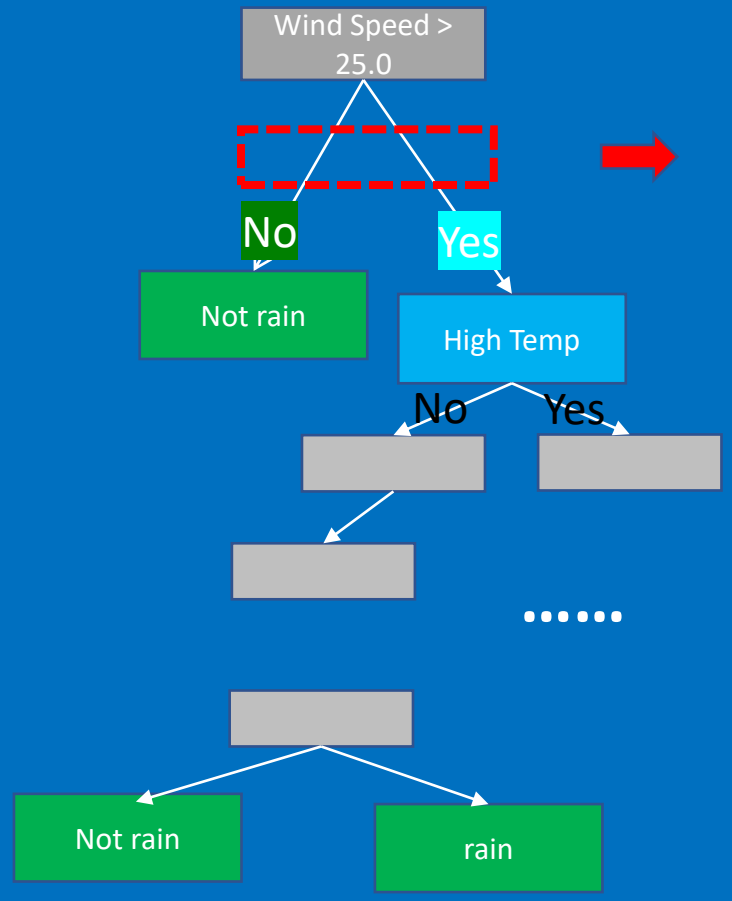


For example, in the hidden step before we go to “High Temp” for our next level. We have a leaf “Rain” with 4 total cases, and apparently this will the last level we can go given the constrain we put here



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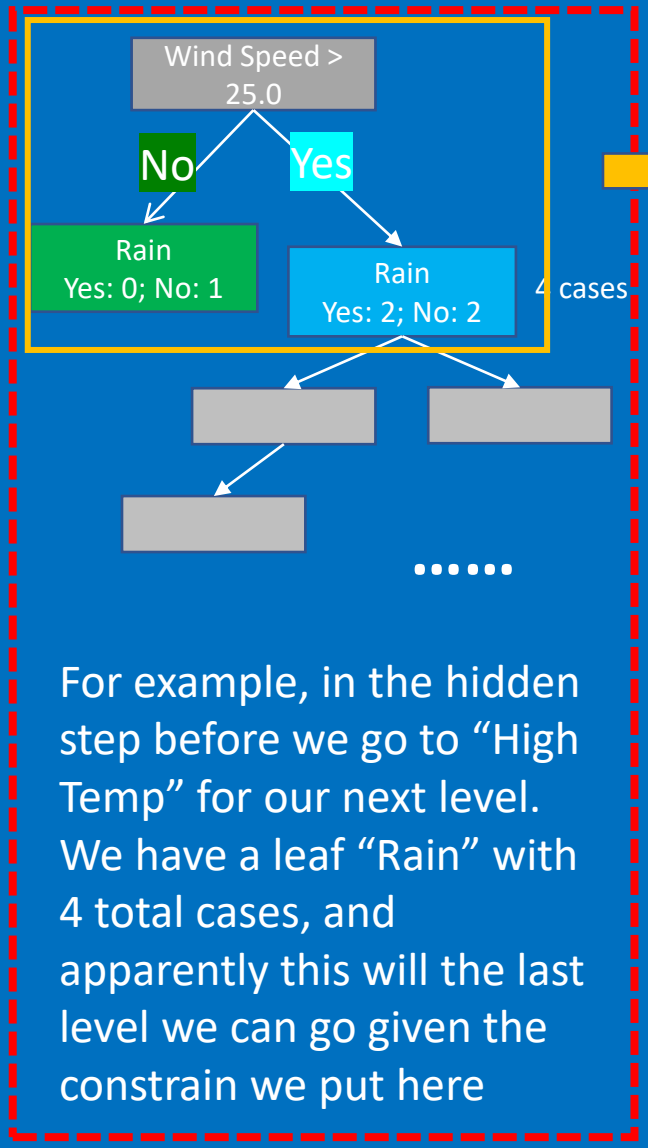

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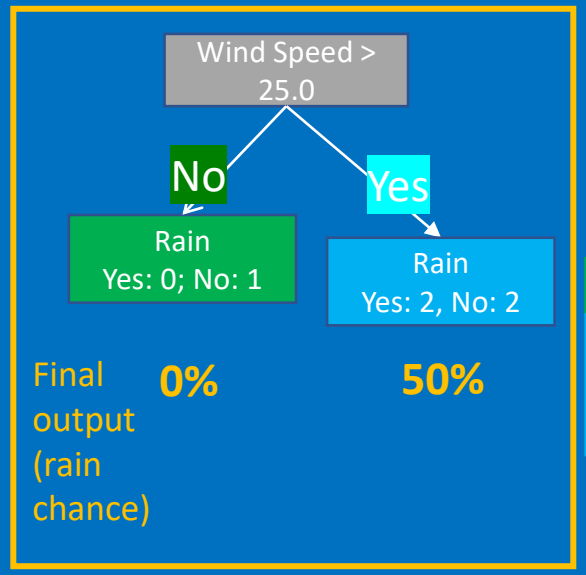

So here we see that by limiting the number of levels (only one level) the tree can grow, we get less determinant output

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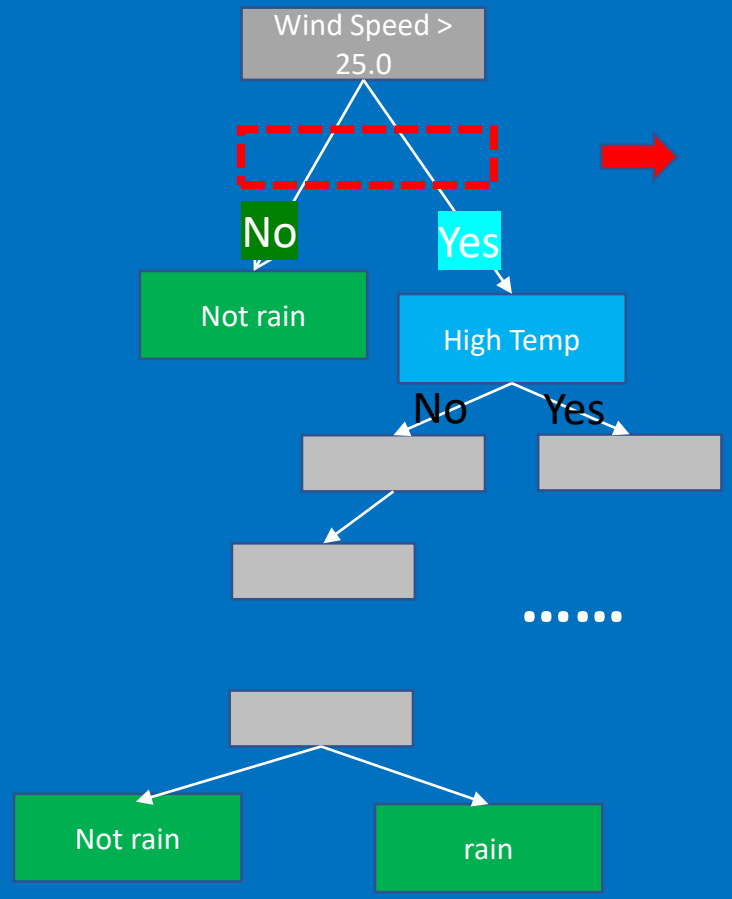

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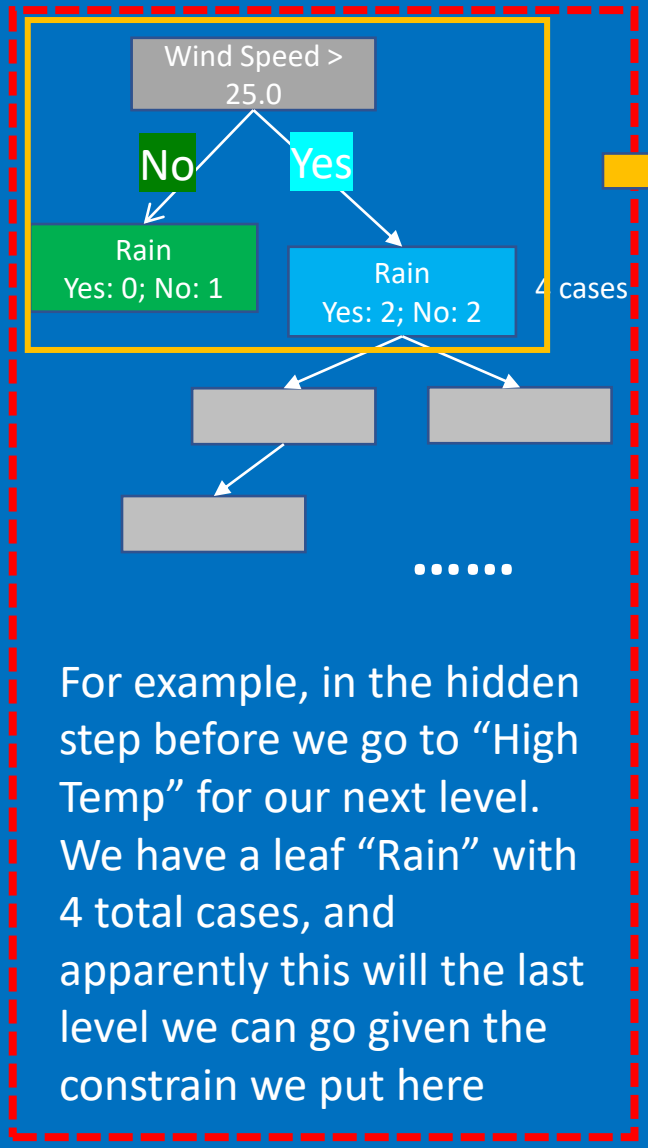

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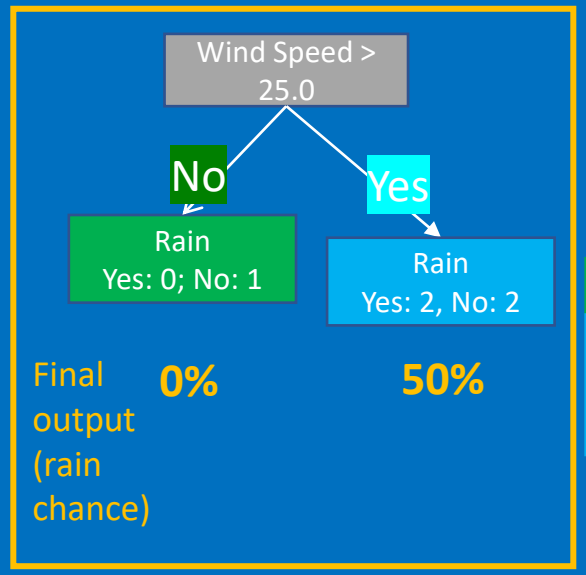

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In reality, we can split training/testing dataset and do a bunch of cross-validations to determine how deep we want our tree to grow

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