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ID3 algorithm

Aim:

To implement ID3 algorithm for decision tree using the party and iris dataset.

Algorithm

- If all examples have same label:
  - return leaf with that label
- else if there are no features left to test:
  - return leaf with most common label
- Else:-
  - choose the feature $\hat{F}$ that maximizes information gain of S to be the next node using:-

$$Gain(S, F) = Entropy(S) - \sum_{f \in values} \frac{|S_f|}{|S|} Entropy(S_f)$$

  - add a branch from the node for each possible value f in F

- for each branch:
  - * calculate S_j by removing $\hat{F}$ from the set of features
  - * recursive call the algorithm with S_j, to compute the gain relative to the current set of examples