

1 What is Decision Tree

While deciding between several job offers with various levels of pay and benefits, many people begin by making lists of pros and cons, and eliminate options based on simple rules. For instance, “if I have to commute for more than an hour, I will be unhappy” or, “if I make less than 50k, I won’t be able to support my family.” In this way, the complex and difficult decision of predicting one’s future happiness can be reduced to a series of simple decisions.

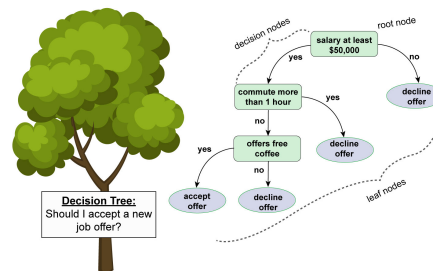


Figure 1

A decision tree is an algorithmic approach depicted in the above flowchart which shows the various outcomes from a series of decisions. It has three main components: root node, leaf nodes and branches. The root node is the beginning point of the main tree, and both the root and the leaf nodes contain questions or various criteria to be answered. Each branch of the decision tree represents a possible decision, occurrence or reaction to the decision. Decision trees give people a highly effective and easy way to understand the range of potential and possible outcomes.

All decision trees begin with a particular decision. Let’s consider the above tree, which predicts whether a job offer should be accepted or not.

- A job offer to be considered begins at the root node, where it is then passed through decision nodes that require choices to be made based on the attributes of the job.
- These choices split the data across branches that indicate potential outcomes of a decision, depicted here as yes or no outcomes. Though in some cases, there may be more than two possibilities.
- In case a final decision can be made, the tree is terminated by leaf nodes (also known as terminal nodes) that denote the action to be taken as result of the series of decisions.
- In case of a predictive model, the leaf nodes provide the expected result given the series of events in the tree.

Decision Trees allow an individual or organization to identify possible actions against one another based on their resources and benefits.