Decision Trees

Himadri Barman

A decision tree is a graphical decision support tool used in areas like Decision Analysis. It uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. It is one way to display an algorithm. Any problem that can be presented in a decision table can be represented using a decision tree.

A decision tree consists of 3 types of nodes:

- Decision nodes from which one of several alternatives may be chosen, represented by squares
- Chance nodes or state-of nature nodes out of which one state of nature will occur, represented by circles
- End nodes, represented by triangles. *Many will not represent this node.*

Steps of Decision Tree Analysis

1. Define the problem
2. Structure or draw the decision tree
3. Assign probabilities of the states of nature
4. Estimate pay-offs for each possible combination of alternatives and states of nature
5. Solve the problem by computing expected monetary values (EMVs) for each state of nature. This is done by working backward, i.e., starting at the right of the tree and working back to decision nodes on the left. Also at each node, the alternative with the best EMV is selected.

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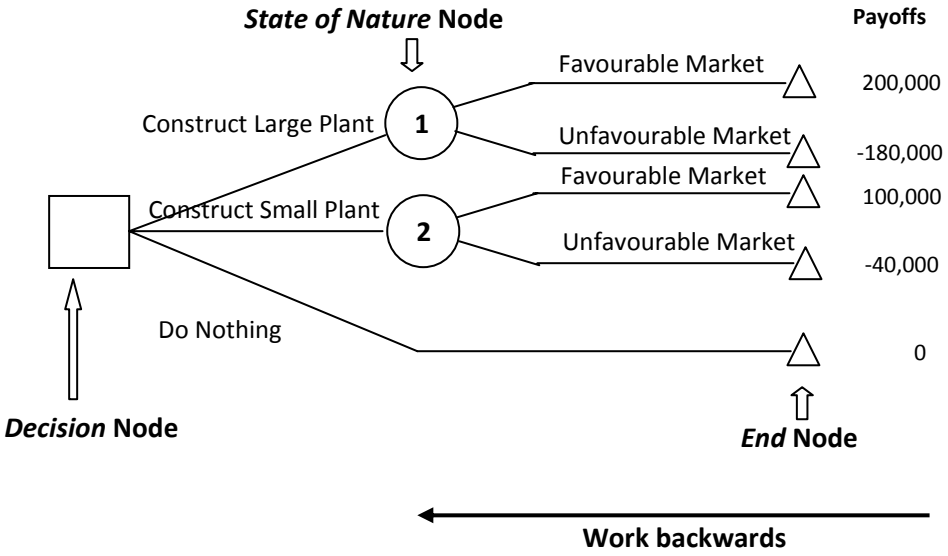

Reference

- Render B, Stair R M, Jr., Hanna M E (2008), *Quantitative Analysis for Management*, Ninth Edition, Pearson Education, New Delhi