Solving Problems by Searching

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Problem Solving Approach

The Problem Solving Approach is a stpe-by-step procedure which helps in formulationg problem,performance measure,constraints,etc.This approach modulates the problem into small modules and makes it easier to arrive at a solution. A solution is basically an action sequence searched from other possible sequences. The following are involved in Problem Solving Approach:

States : Set of all possible allowed sequences.

Initial State : Initial state of the problem.

Actions : Response of the system to a state.

Transition Model : This the place where we define our problem's contraints.

Goal Test : Test wheather the computed result is a desirable one or not.

Path Cost : This is a performance measure,we need to minimize path cost in order to maximise performance.

Examples

include Protein design, n-queen problem, VLSI layout

Searching for Solutions

Let us start by considering what is a problem and its solution.A problem is an query formulated from some information,where as a solution is an answer to that query. For us humans , it is a straight forward way to solve a problem(depending in sime other factor as well – prompt: find a general problem solving approach), but for a computer/agent it is a very different/cumbersome

process. A computer can easily process information with speeds humans can never match, but a computer cannot use some infirmation to come to a conclusion,i.e it is good at 'computing' data but not so good at finding solutions.

One clever way to work around this problem is to map out each and every possible solution/stage using a search tree:
A search tree is a list of all possible sequences starting with the initial state at the 'root'.The branches are actions and the nodes scorrospond to a specific state in the state phase of the problem.(discuss parent,child,and leaf node)

Expanding nodes from the set of all leaf nodes(at a given point) until a solution is found is the general tree-serach strategy.Search Algorithms share this basic structure,but they might differ in how they choose which state to expand next(sear h strategy)