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Assignment : Explaination of AO* Algorithm

AO* algorithm is generally used where we break down problem into small problems, try to solve the problem individually and then combine the results to crack the bigger problem. Generally we use AND-OR graphs or AND-OR trees for the functioning and representation of AO* algorithm. In short it si, a top-down approach of traversing the best-path according to need of problems.

Working of AO* :

Notation : Here we have a single entity namely GRAPH, which represents that part (nodes) of graph that has been explicitly generated.
1. Initialize the graph to start node.
2.Traverse the graph following the current path accumulating the nodes in our entity GRAPH that havent yet been explored or solved.
3. Pick any one of these values and expand it
a) if it has no successors then, call this value as FUTILITY
b) otherwise calculate the f' (same as h') value for all the successors.
4. If f' value is zero, that is, it is a terminal node, then mark it as SOLVED.
5. Change the value of f' for every newly added node, to notify it to its successors, that it is their parent in order to go back.
6. Try to do the above process , also try to get the most promising route . Also, if any node is marked SOLVED then also mark its parent and so on as SOLVED before exiting the search.
7. If the starting node is marked SOLVED eventually or the value gets greater than FUTILITY, then stop the process finally, otherwise loop back from step 2.

Advantages of AO* :

1.It can be used for OR graphs as well as AND-OR graphs.
2. Also, the exploration of graph is combined in a single entity.

Disadvantages of AO* :

1. It does not always guarantee an optimal solution.
2. Sometimes when it splits down solving sub-problems, then it does not ensure the dependancy of sub-problems while combining their results.