

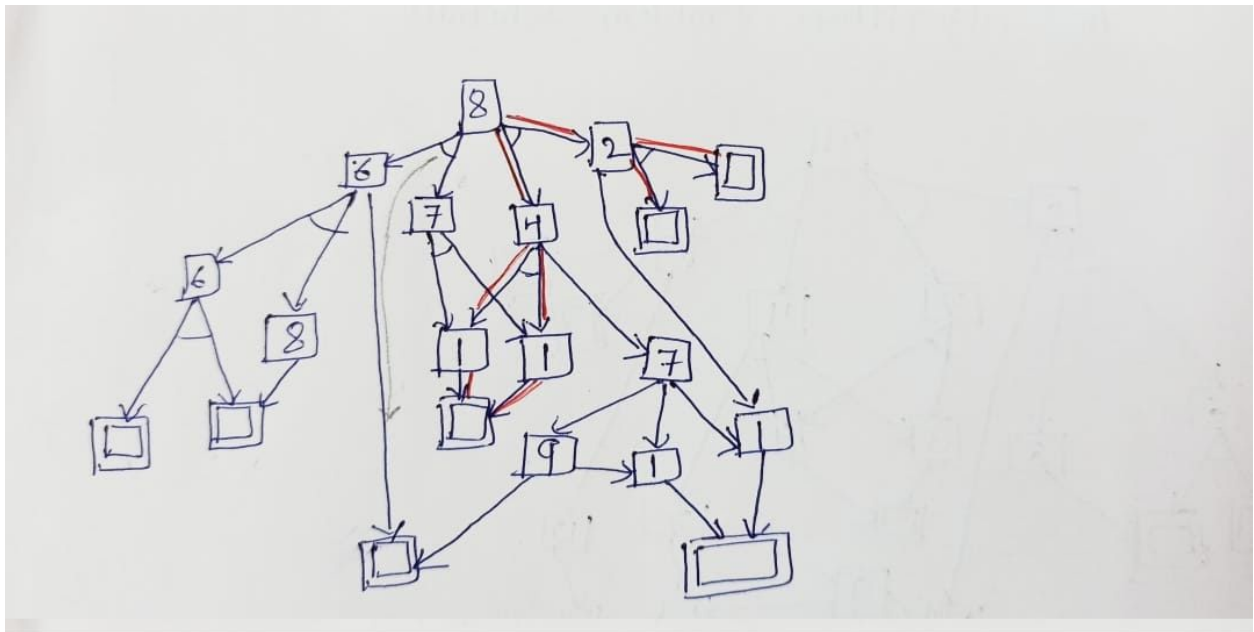
A0* Algorithm Problem Solution

The diagram illustrates the A0* algorithm's search process through a series of seven hand-drawn search trees. The root node is 21. The trees show the expansion of nodes and the pruning of branches that are not optimal. The nodes are labeled with numbers, and some are enclosed in boxes to represent the current state of the search. The final tree shows a complex structure with many nodes, including some that are pruned (indicated by a diagonal line through the node).

The sequence of trees is as follows:

- Tree 1:** Root 21 expands to 6 and 5. Node 6 expands to 6 and 8. Node 5 expands to 7 and 4. Node 7 expands to 3 and 4. Node 4 expands to 7 and 10. Node 3 expands to 9. Node 9 expands to 10. Node 10 expands to 10.
- Tree 2:** Root 21 expands to 11. Node 11 expands to 6, 7, and 4. Node 6 expands to 6. Node 7 expands to 7. Node 4 expands to 4.
- Tree 3:** Root 21 expands to 8. Node 8 expands to 6, 7, and 4. Node 6 expands to 6. Node 7 expands to 7. Node 4 expands to 4.
- Tree 4:** Root 21 expands to 12. Node 12 expands to 6, 7, and 2. Node 6 expands to 6. Node 7 expands to 7. Node 2 expands to 8. Node 8 expands to 3, 4, and 7. Node 3 expands to 3. Node 4 expands to 4. Node 7 expands to 7.
- Tree 5:** Root 21 expands to 13. Node 13 expands to 6, 7, and 9. Node 6 expands to 6. Node 7 expands to 7. Node 9 expands to 3, 4, and 10. Node 3 expands to 3. Node 4 expands to 4. Node 10 expands to 9, 10, and 10.
- Tree 6:** Root 21 expands to 11. Node 11 expands to 6, 7, and 2. Node 6 expands to 6. Node 7 expands to 7. Node 2 expands to 7. Node 7 expands to 1, 4, and 10. Node 1 expands to 1. Node 4 expands to 9. Node 10 expands to 10.
- Tree 7:** Root 21 expands to 8. Node 8 expands to 6, 7, and 4. Node 6 expands to 6. Node 7 expands to 7. Node 4 expands to 11. Node 11 expands to 11. Node 11 expands to 9, 1, and 1. Node 9 expands to 9. Node 1 expands to 1. Node 1 expands to 1.

Cost of solved nodes=0, Cost of arc=1



Solution found with cost=8

The heuristic functions in some places have higher estimates and it refuses to consider unseen alternatives due to worse estimate. Here it may miss better solutions. In the above AO graph has a better solution costing 7 units which algorithm misses.