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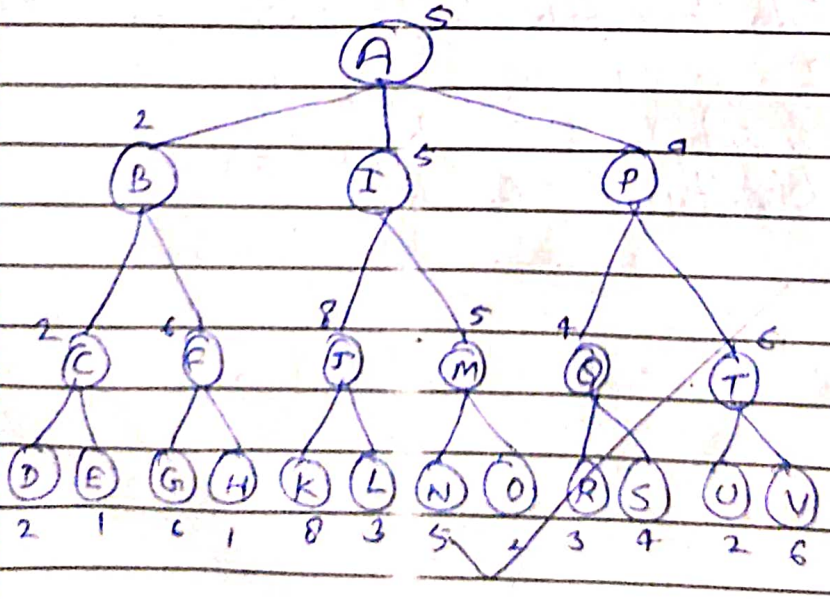
Tutorial 7

(1) The algorithm starts with random placement of queens & then tries to move 1 queen at a time to a better position such as one that reduces number of conflicts (local minima).

One variant that can be used is steepest ascend hill climbing. It chooses the option with highest increase in fitness score i.e., no. of queens that are not threatening each other.

In practice, both hill climb & its variants are not guaranteed to find a solution.

(2)



Best path: A - I - M - N

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Alpha beta pruning helps in adversial search by reducing the number of nodes that need to be evaluated, which can save significant amount of competition.

(3)

(i) Unary : Simplest form of constraint. It's a contraint that only involves a single variable. It specifies a range of values which the variable can take

(ii) Binary : Binary constant involves 2 variables. Usually represented by equality / inequality.

(iii) Global : This constraint involves multiple variables & specify complex relations. These are used for complex nodes.

(4) Minimum Arc Consistency (MAC) is a contraint propagation algorithm used in constraint satisfaction problems. It works by repeatedly removing inconsistent values from the domain until all contraints are satisfied

→ 4 queen problem
Variables : 4 vars, determining col position in each row.
Domain : {1, 2, 3, 4}
constraint : No. 2 queens in same row column & diagonal

MAC algo :
→ Start with {1, 2, 3, 4}
→ Select a var & check its consistency with other vars by examining all possible asmts to other var.
→ If asmt violates constraint, remove it from domain.
→ Repeat above steps.

(5) Variables : Each variable represents a class & its domain set of available slots

Domain : Set of available time slots for the corresponding class.

Constraints : Time slot constraints, prof. availability, contraints, RAM constraints.

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