

Answer all questions

Question 1:

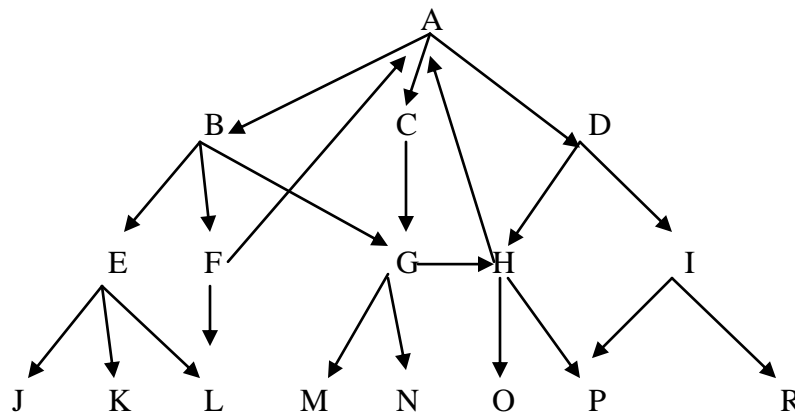
- Prove that implication is transitive in the propositional calculus, that is, that $((P \rightarrow Q) \wedge (Q \rightarrow R)) \rightarrow (P \rightarrow R)$.
- Given the following statements
if it is sunny and it is warm, then Samy is happy.
if there is blue sky then it is sunny.
there is blue sky.
it is warm.
is Samy happy?
Use resolution to show Samy is happy

Question 2:

- Draw a diagram and discuss the architecture of a typical expert system for a particular problem domain.
- Consider the following rules:
Rule1: if the engine is getting gas, and the engine will turn over,
then the problem is spark plugs.
Rule2: if the engine does not turn over, and the lights do not come on,
then the problem is battery or cables.
Rule3: if the engine does not turn over, and the lights do come on
then the problem is the starter motor.
Rule4: if there is gas in the fuel tank, and there is gas in the carburetor
then the engine is getting gas.
Suppose gas in the fuel tank = yes, gas in the carburetor = yes, and the engine will turn over = yes,
simulate the following:
 - The back chain and its explanation model by the goal “the problem is X”.
 - The forward chain

Question 3:

“Hand run” the backtrack algorithm on the following graph. Begin from state A. Keep track of the successive value of NSL, SL, CS and DE.



Where SL for state list, NSL for new state list, CS for current state and DE for dead ends.