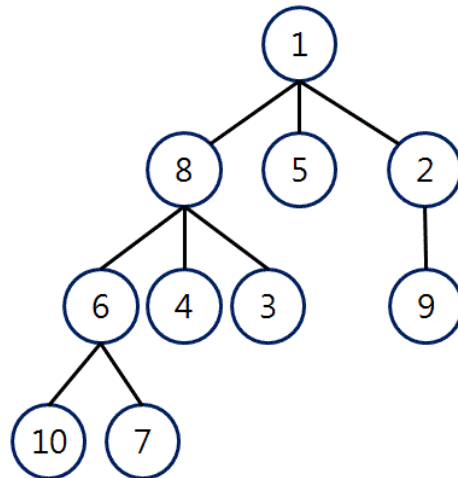# ASSIGNMENT - 1

1. Breadth-first and depth-first are two algorithms for performing uninformed search—a search that does not use knowledge about the goal of the search. Implement both search algorithms and test them on following graph (1 is the Start node and 3 is the Goal Node).

2. In missionaries and cannibals problem, 3 missionaries and 3 cannibals are on one side of the river. One boat can carries at most 2. Missionaries must never be outnumbered by cannibals. Implement Breadth First Search (BFS) to perform state space search and give a plan for all to cross the river.
   The state space representation of the problem is given below:
   - <M, C, B> corresponds to a state where M refers number of missionaries on the left bank, C refers number of cannibals on the left bank and B refers position of the boat (Left or Right).
   - Initial state is <3, 3, Left> and goal state is <0, 0, Right>.
   - <M, C> corresponds to an operator where M refers to number of missionaries on the boat and C refers to number of cannibals on the boat. The valid operators are <1, 0>, <2, 0>, <1, 1>, <0, 1>, <0, 2>.

   Run BFS on the states and these states will be created after applying allowed operators and also keep track of states that should be visited only once in the search.

3. Implement Uninformed Search Depth First Search algorithm considering Water Jug Problem. Report Order of nodes visited and Solution Path for the search technique.

4. Implement Uninformed Search Breadth First Search algorithm considering Maze Problem. Report Order of nodes visited and Solution Path for the search technique.