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***CSL5402 Artificial Intelligence Lab5***

**List of Experiment: Implement the following Production System problems using Python.**

1. The John is an engineering student of CS/IT and right now he is in the home during lockdown period in COVID-19 situation. The John is playing mobile games in all the time, therefore his mother requests him to perform a task with justification (proof of procedure followed to solve the following problem) for her. According to that task, she told:

*“I am giving you two buckets, a 4-litre one and a 3-litre one. Neither have any measuring markers on it. There is a pump that can be used to fill the buckets with water. How can you get exactly 2-litre water into the 4-litre bucket?”*

The John is an engineering student, and he has knowledge of searching algorithms. So, he is ready to solve the above task virtually (for justification purpose) by using BFS algorithm.

Write a Python program to implement production rule systems of the above task for preparing the justification for his mother.

1. Now, the John is working for a Water supply company. He has to present the solution for a given problem in front of his boss. He needs to be make presentation for that problem which is as follows:

*“The task is to set up a connection for water supply. Set the water supply in one city and water gets transported from it to other cities using road transport. Certain cities are blocked which means that water cannot pass through that particular city. Determine the maximum number of cities to which water can be supplied.”*

During presentation, he is using one of the uninformed search algorithms to solve the above problem with some raw data as: given N cities which are connected using N-1 roads. Between Cities [i, i+1], there exists an edge for all i from 1 to N-1. The following information have been used in the presentation:

* The first line contains an integer >strong>N denoting the number of cities.
* The next N-1 lines contain two space-separated integers **u v** denoting a road between  
  city u and v.
* The next line contains N space-separated integers where it is 1 if the **ith** city is  
  blocked, else it is 0.

Write a Python program to implement production rule systems for water supply problem.