Department of Information and Communication Technology

Faculty of Technology

UCT31021 – Practical for Artificial Intelligence

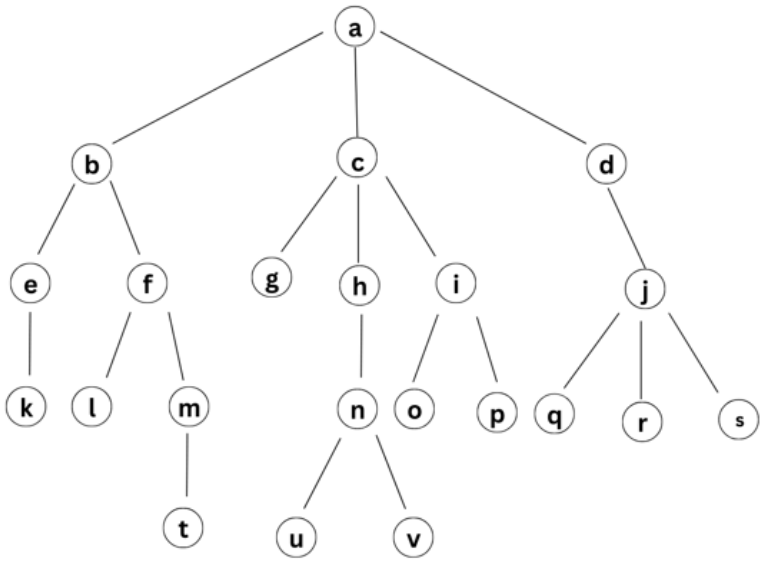
In-course Assessment -III

Date: 14.08.2024 **Time Allowed: 03 hours**

Instructions:

- Create a folder on the desktop with your Registration Number **(e.g. SEU/IS/19/ICT/XXX)** and save your answer scripts inside the Folder.
- Write a separate Prolog(.pl) for each of the main Questions.
- Save screenshots of the each of the infer/queries and their corresponding answer within the same folder.

01. Create a knowledgebase with suitable facts by using list to represent following tree.

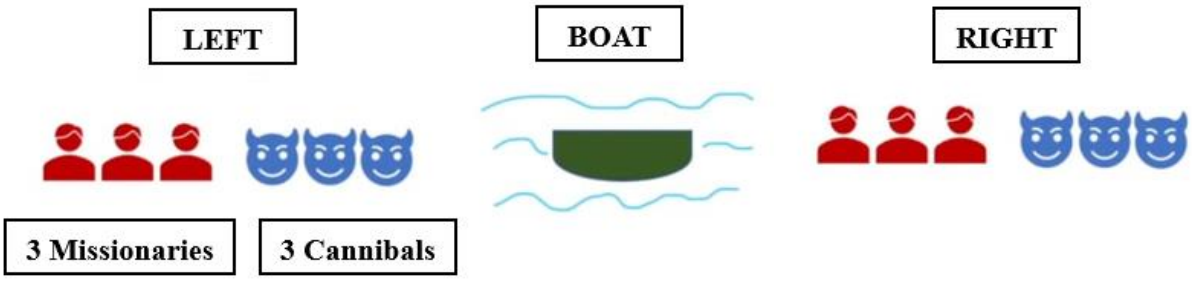


a. The result of the BFS of a list of **[a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, and v].** Create rules to have the results of BFS.

b. The result of the DFS of a list of **[a, b, e, k, f, l, m, t, c, g, h, n, u, v, i, o, p, d, j, q, r, and s].** Create rules to have the results of DFS.

[Total Marks 30]

02. In the **missionaries and cannibals' problem**, three missionaries and three cannibals must cross a river using a boat. The boat can carry at most two people at a time. At any point in time, if the cannibals outnumber the missionaries on either side of the river, the missionaries will be eaten by cannibals. The boat cannot cross the river alone with no people on board. **The goal is to find a way to get all the missionaries and cannibals across the river safely.**

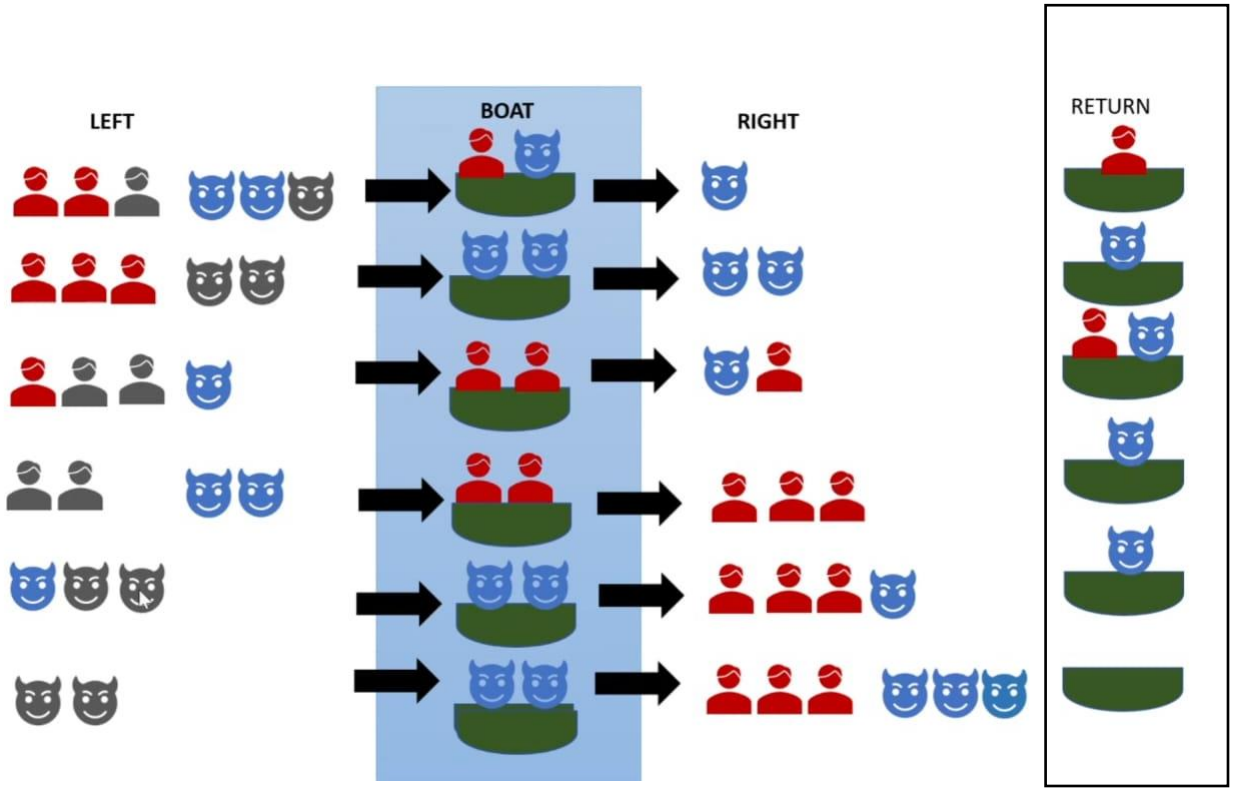


Tips:
Identify **initial state** and **goal state**.
Create conditions.
If Missionary represented by **M** and cannibal by **C** then,

Production Rules

Rule	State	Description
1	(0, M)	One missionary sailing the boat from Left to Right.
2	(M, 0)	One missionary sailing the boat from Right to Left.
3	(M, M) (M, M)	Two missionaries sailing from Left to Right. Two missionaries sailing from Right to Left.
4	(C, C) (C, C)	Two cannibals sailing from Left to Right. Two cannibals sailing from Right to Left.
5	(0, C)	One cannibal sailing the boat from Left to Right.
6	(C, 0)	One cannibal sailing the boat from Right to Left.
7	(M, C)	One missionary & one cannibal sailing the boat from Left to Right.
8	(C, M)	One missionary & one cannibal sailing the boat from Right to Left.

A possible solution is,



[Total Marks 70]