ACI Assignment 1

Question 3 B - War Zone Supply Agent

Problem statement:

The following scenario depicts a city in Afghanistan. India has sent food supplies to needy people. There are 10, 2-kilogram packets of dhal, 15, 1000-ml cartons of milk, 10, 2.5-kg packets of flour, 20, 2-kg packets of rice, 15 bread loaves. Each child consumes about 2 cartons of milk and one loaf of bread in 5 days and adults consume 2.5 Kilogram flour and 2.5 kilograms of rice and 1 kilogram dhal in 5 days. The following picture shows the number of people living in tents throughout the city. Since it is a war zone, drone agents are employed to distribute supplies. You are to program a robot to distribute the supplies to different tents based on the number of people living there using a smaller number of commutes and see that all the tents are supplied. In the figure A denotes adults and C denotes children. The drone agent can carry 10 Kg's weight or 10 bread loaves or 10 cartons of milk at a time. Use the following algorithms

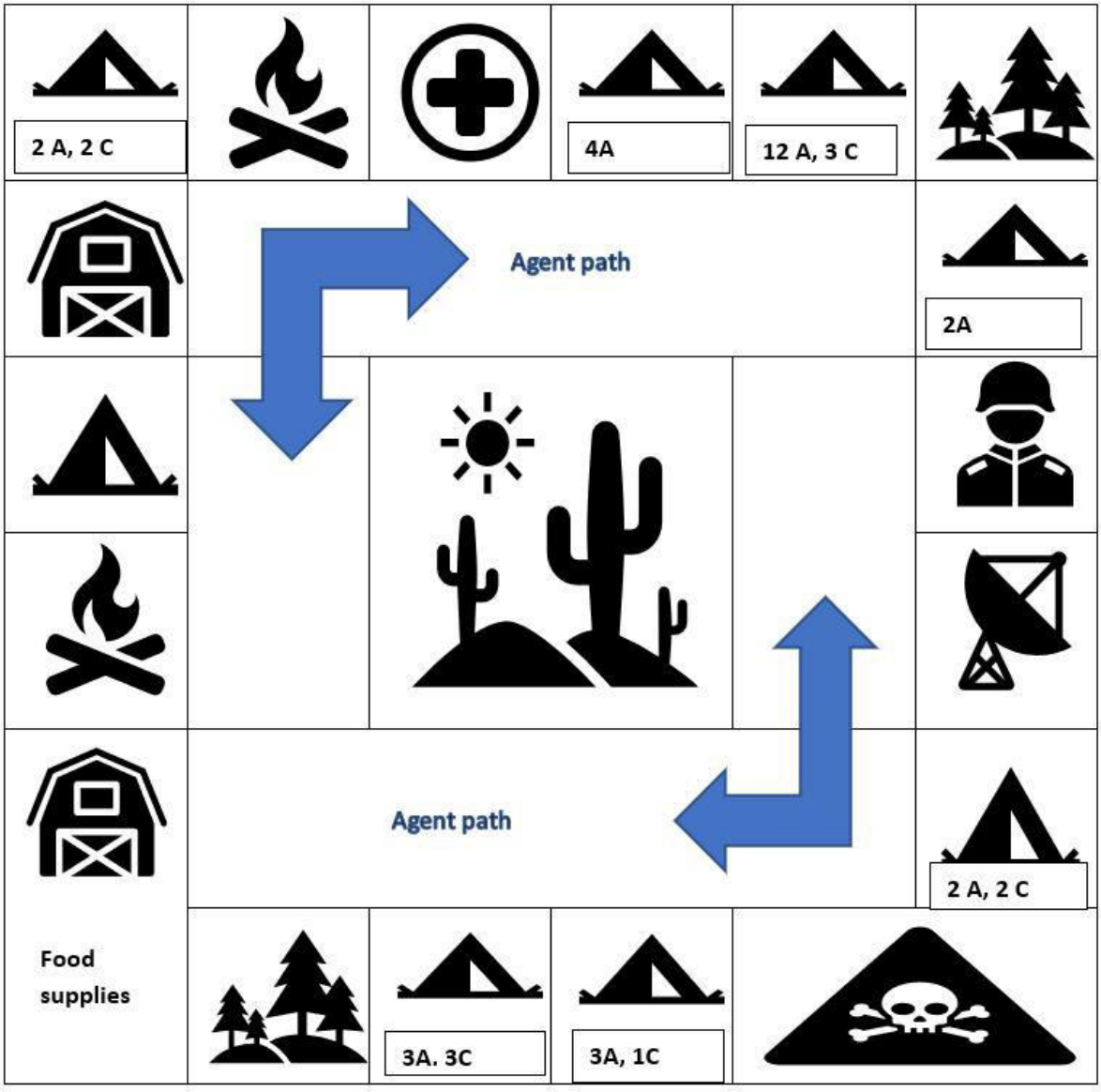
a. **Depth Limited Search**
b. **Recursive Best First Search**.

Note 1:

From the inputs given in the problem statement and the requirements specified under below evaluation sections, propose suitable relevant design of step cost and heuristic cost and justify the choice.

Evaluations will be based on the following:

1. Explain the PEAS (Performance measure, Environment, Actuator, Sensor.) for your agent. (20% marks)
2. Use Depth Limited Search and Recursive Best First Search algorithms and implement the algorithms in PYTHON. Compare to interpret the results in terms of the algorithm working, performance & shortest path if obtained relevant to the given problem. (20% + 20% = 40% marks)
3. Print the number of commutes by the supply agent, the units carried by the agent in each commute, and the remaining ration of different capacity and/or remaining tents with amount of ration to be supplied for the store keeper's reference. (20% marks)
4. Include code in you implementation to calculate the space complexity and time complexity and print the same. (20% marks)

Note 2:

- You are provided with the python notebook template which stipulates the structure of code and documentation. Use well intended python code.
- Use separate MS word document for explaining the theory part. Do not include theory part in the Python notebook except Python comments.
- The implementation code must be completely original and executable.
- Please keep your work (code, documentation) confidential. If your code is found to be plagiarized, you will be penalized severely. Parties involved in the copy will be considered equal partners and will be penalized severely. Collaboration among different group members will also be considered as plagiarism.