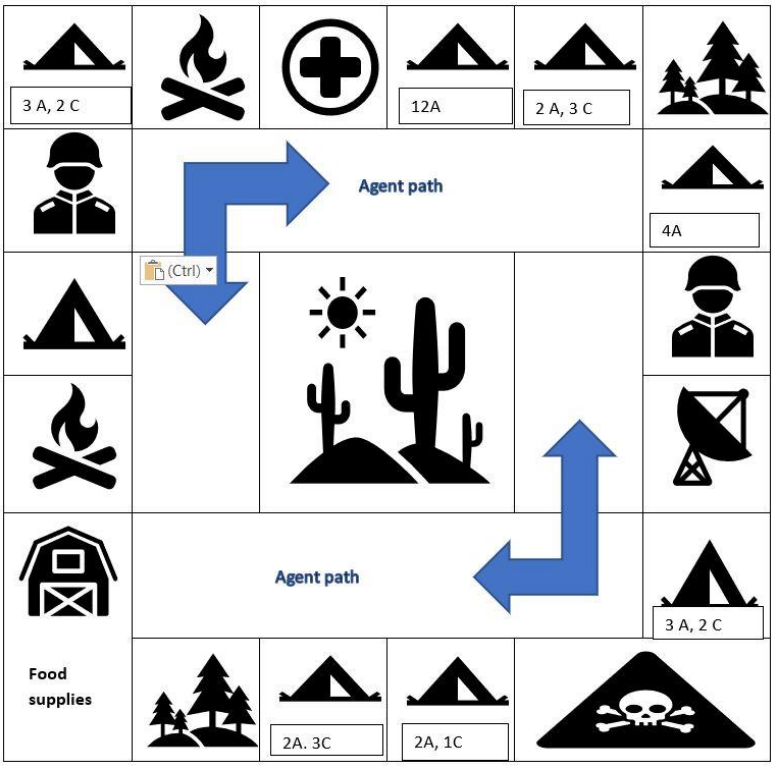
ACI Assignment 1

Question 3 A - War Zone Ration Agent

Problem statement:

The following scenario depicts a city in Namibia which is affected by food scarcity. India has sent food supplies to needy people. There are 15, 2-kilogram packets of dhal, 28, 1000-ml cartons of milk, 12, 3-kg packets of flour, 20, 2.5-kg packets of rice, 10 bread loaves. Each child consumes about 3 cartons of milk and 1 loaf of bread in 7 days and adults consume 3 Kilogram flour and 3 kilograms of rice and 1 kilogram dhal in in a week. The following picture shows the number of people living in different places in a city. Drone agents are employed to distribute supplies to different locations. You are given the responsibility to program a robot to distribute the supplies to different locations (represented as tents in the map) 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 15 Kg's weight or 15 bread loaves or 15 cartons of milk at a time. Use the following algorithms to solve the problem:

a. Hill climbing algorithm
b. Iterative Deepening A* algorithm.



Evaluations will be based on the following.

1. Explain the PEAS (Performance measure, Environment, Actuator, Sensor.) for your agent. (20% marks)
2. Use the mentioned algorithms and implement the algorithms in PYTHON (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 your 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.