

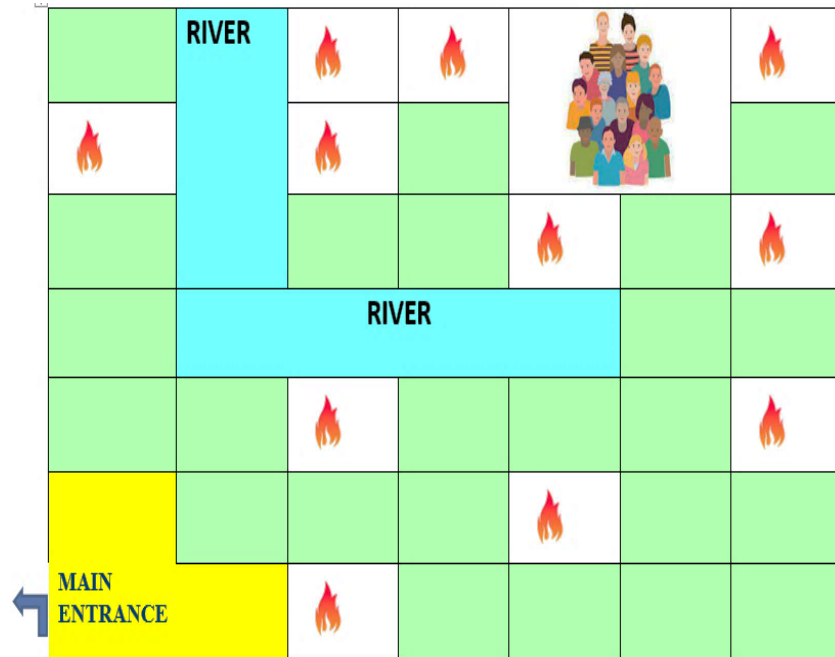
ACI Assignment 1

Question 1 A– Rescue Agent

Group of peoples were trapped in Kangaroo Island due to sudden Bush Fire. Given below is the picture of a forest as a grid. Due to heavy Bush Fire some of the paths for main entrance are blocked. They are in the position to reach main entrance quickly because of fast spreading of fire. You have a rescue agent to help you find the shortest, quickest and safest route through the available paths avoiding the blockades so that you can reach main entrance safely. You are provided with the map of the forest with the current situation marked. Use the following algorithms to find the safest path.

a. Breadth First Search and

b. Recursive Best First Search



Note:

No diagonal movements allowed. You cannot pass through river and fire affected area. 10 points to be added when your path passes to adjacent for every fire block. 5 points to be reduced when your path passes to river block. For every transition +3 should be added as step cost. The path which passes through minimum number of squares and minimum points is the shortest and safest path. Squared Euclidian distance can be considered as heuristic value.

Evaluations will be based on the following.

1. Explain the PEAS (Performance measure, Environment, Actuator, Sensor.) for your agent. (20% marks)
2. Use Breadth First Search and Recursive Best First Search 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 path, the total points for the path and the number of squares in the path. (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. Collaboration among different group members will also be considered as plagiarism.