

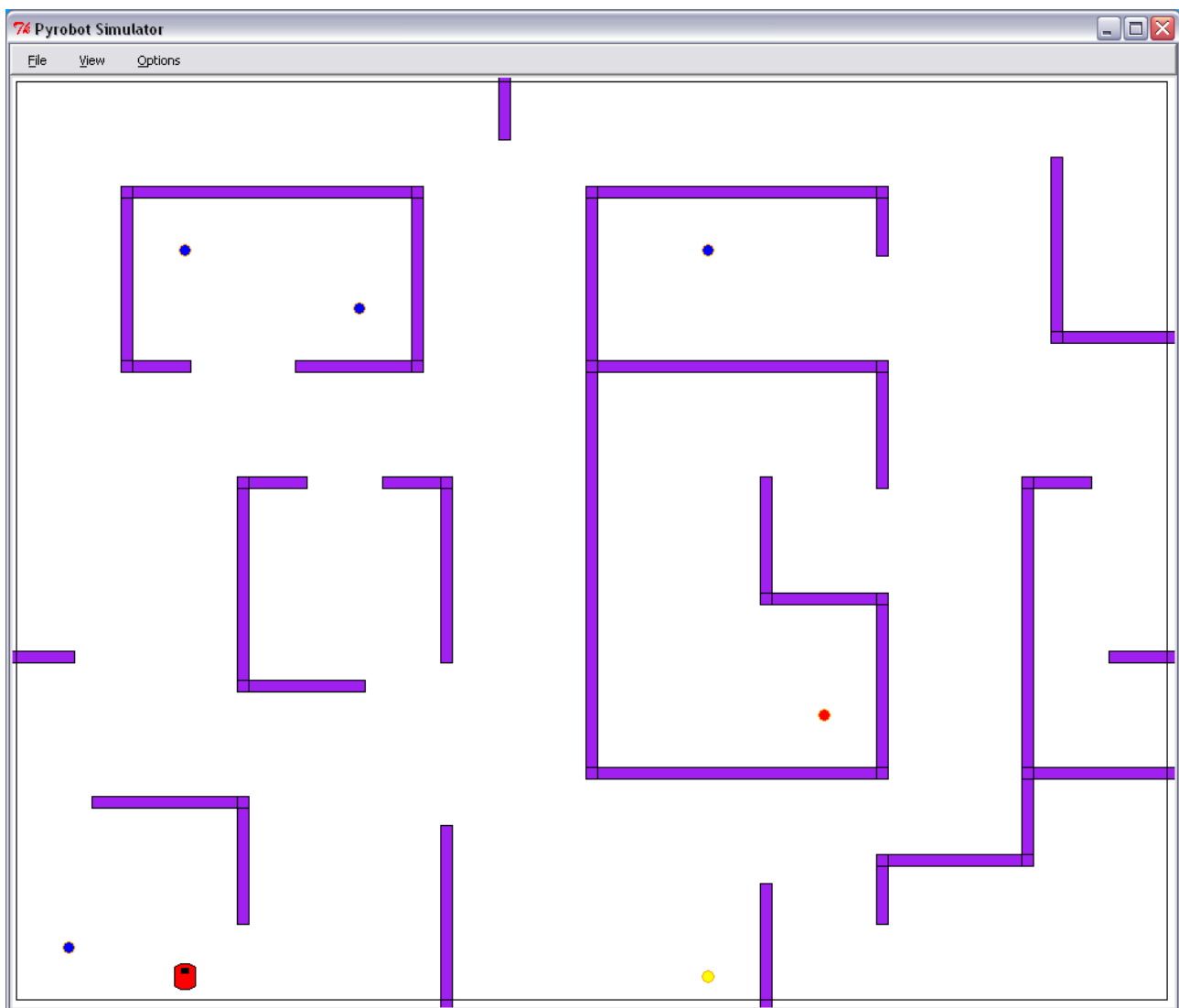
Assignment (2010 INB860)

Due date: start of week 12

[Use *Assignment Minder* to submit your work. Group size (from 1 to 3)]

Overview

In this assignment, you will design and implement a number of behaviors for a robot equipped with a sonar ring, two light detectors (front left and front right) and a compass. Your programs will be tested with an arena similar to the one below. The arena for the robot is approximately 20m by 16m. In the arena, there are walls (purple) and lights (blue, yellow and red).



You can assume that

- The test environment will be about the same (up to 20% larger or smaller)
- There will be a single yellow light, and this light will be on the outer boundary of the arena (within a meter of the outside wall).

Tasks

1. Write a “*fuzzy wall follow*” fuzzy controller to get the robot to follow a wall (around corners and around door openings).
2. Write a “*search red*” exploratory random behavior such that the robot stops when it finds a red light.
3. Write a “*search blue double*” exploratory random behavior such that the robot stops when it is in a room with two blue lights.
4. Write a “*backpacker*” behavior such that when the robot is started near the outer wall, it makes a tour of the outer wall and stops approximately where it started.
5. Same as Task 4, but this time you are not allowed to use the compass.
6. Write a “*search and rescue*” behavior such that when the robot is started near the outer wall, it searches for the room with the two blue lights. Once it finds the room, the robot should return to its starting position, displays a message, then go back again to the room with two blue lights using a short path.

Deliverables

1. A statement of completeness (list which behaviors you are submitting and any limitation)
2. A separate brain file for each behavior
3. A report limited to 5 pages
 - explaining concisely your approach for each behavior
 - describing the performance and limitations of the behavior you have implemented

All the files should be put on a CD, with a README.TXT file describing the contents of each file.

Draft Marking Scheme (out of 30)

- Report *6 marks*
- Code quality (readability, simplicity, structure, genericity) *4 marks*
- Each behavior *4 marks* [I am aware that $6+4+6*4$ is larger than 30]

Final Remarks

- Do not underestimate the workload. Start early. You are encouraged to ask questions during the practical sessions. But, the closer the submission date, the less help/hints you will get.