**Virtual Initio Programming: Exercises with Beliefs and Goals**

**AIM:** This exercise sheet provides additional exercises programming with cognitive/BDI agents, beliefs and goals.

**Exercise 1**: Write an obstacle avoidance agent. So, if the agent believes there is an obstacle on the left or right it turns and if it does not believe there is an obstacle on the left or right it moves forward. If it believes that there is a line on the left, it should stop.

**Exercise 2:** Program up obstacle avoidance behaviour for a cognitive agent using the idea that if there is something closer than 50cm from the robot then it should believe there is an obstacle. Then it should turn or move forward depending upon whether or not it believes there is an obstacle

**Exercise 3:** Write an agent that has a goal to find an obstacle on the left. While it has this goal, it should move forward. When it believes the goal has been achieved (i.e., it believes there is an obstacle on the left) it should stop.

**Exercise 4:** Write a square following agent that will move around the edge of the square in **square.xml** keeping one line sensor in the square and one line sensor out of the square and turning if both sensors are out of the square. If it believes that there is an obstacle on the left, it should stop.

**Exercise 5:** Write an agent that has a goal to ‘edge\_square’ which it can achieve by first achieving ‘line\_left’ and then executing the algorithm to go around the edge of the square. When it believes that there is an obstacle on the left, the agent should drop the goal and stop.



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