Design Challenge 3: A (Robot) Bug's Life

1 Goal

The goal of this design challenge is to program your robot to act like one of two very different insects: a moth or a cockroach. There is a bright light in the center of the game area. Moths like light, and want to drive towards it. Because they like it so much, they really like to drive around it in circles. Cockroaches hate the light. They want to do everything they can to avoid it. They hate it so much, that if they could spend all their time under a table away from it, they would.

2 The Rules:

1. We will divide you into two teams: "Team Moth", and "Team Roach".
2. You should brainstorm as a team. That means everybody stops writing software, gathers around the white board, and talks about ideas.
3. You can test and measure anything you want. Use your code from PS04 to print the light sensor values from all three sensors. Knowing what light levels exist in different locations is critical to completing this challenge. But don't measure forever, the sensors aren't very accurate. Its best to start writing some software early!
4. You can test your software as much as you like.
5. When you want to try to score points, you must get a member of the course staff to observe your robot's performance. The instructor will place your robot at a random position and direction on the start zone, shown in Figure 1. Your software must work if the robot is started in any position and facing any direction.
6. If your robot leaves the game area during a scoring test, the staff member will pick it up and put it back on the start circle. You are allowed two out-of-bounds replacements during a scoring trial. After that, you need to go fix your software. you can try to score again
7. Each person can only earn one standard point and one bonus point for their team.
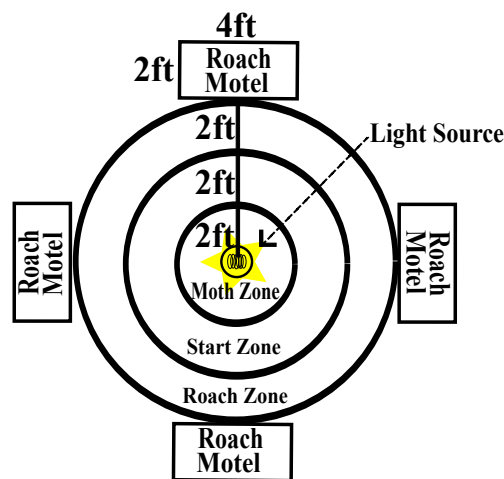

Figure 1: Zone diagram.

(See other side for scoring details)

Team Moth:

Team Cockroach:

1. Standard Point: Make your robot stay in the Moth scoring zone shown in Figure 1 for 10 seconds.
2. Bonus Point: Orbit the light 3 times, consecutively. Orbiting less than this earns no points.

1. Standard Point: Make your robot stay in the Cockroach scoring zone shown in Figure 1 for 10 seconds.
2. Bonus Point: Get your robot under a Roach Motel shown in Figure 1 and have it stay there for thirty seconds. If your robot leaves the roach motel before that time, you earn no points.