Lab Worksheet

**Name**: Riley Lawson

**Lab Partner Name (if you worked together and are submitting the same document or mostly the same answers):** [Drake Dodson](mailto:dwdodson@iastate.edu)

**Lab Section**: 9

This lab worksheet is a final deliverable after a lab is completed, referred to as the postlab. A postlab will not be assigned for every lab. You have two deliverables for every lab, the prelab and demonstrations. The postlab is a third deliverable for some labs.

1. **Prelab assignment BEFORE LAB**: Posted with the lab manual, typically involves a system sketch, submitted in Canvas before the start of your lab section, may be worked on, reviewed and/or used by lab partners in class on Tuesday during lab planning
2. **Demonstrations IN LAB**: Demonstrated/discussed with a TA in lab (or later) and evaluated using a rubric in Canvas (functional demo of a lab milestone, debug demo using debugging tools to explain something about the internal workings of your system, Q&A demo showing ability to formulate and respond to questions)
3. **Postlab assignment AFTER LAB**: Submitted in Canvas after demonstrations, may be reviewed by lab partners in class, consists of three items (prelab planning notes, lab notes, and lab retrospective)

Deliverable #1 has its own Canvas assignment submission. (10 points)

Deliverable #2 has an evaluation rubric used as a checklist and scored by TAs in Canvas. (40 points)

Deliverable #3 has its own Canvas assignment submission. (30 points)

This worksheet will help you develop the items needed for deliverable #3.

1. **PRELAB PLANNING NOTES**
2. What are three questions you want to explore from your lab planning work?

* How can we get the cybot to move around objects efficiently?
* Will the cybot sensor work correctly with objects that are farther away?
* What is the most efficient way of getting the cybot to move around objects? Continuously? or Continuously scanning?

1. What are several tasks you identified in your planning (for you and lab partner)?

* First we had to find the object, angle, distance, and width display correctly
* Then we tried to decide whether or not we were to scan within a certain range or to scan once and navigate around other objects

1. **LAB NOTES**

During lab, keep notes about the following so that you can submit information with this deliverable.

1. Results related to up to three planning questions (might be answers, might be more questions, write brief summaries, don’t include code files)
2. Any additions, refinements, or corrections to the prelab system sketch based on what you learned (include an updated sketch, or briefly describe at least one update you made)
3. Description of your debug demo (what did you demo and why, what did you find, a paragraph is fine, may want to include a screenshot)

* When originally working on our lab we got many things to run smoothly, however the one simple thing that never looked correct was when trying to properly display our code in putty. We eventually realized that we hadn’t included /r within the string, thus, leading to a wacky format.
* We learned that even though the idea of a lab might be simple, do not be fooled to think that that the task will be easy. This occurred especially in this lab when we were trying to figure out the object avoidance system in part 3. We started off having an original idea of scanning once and then navigating throughout the obstacles reaching the smallest object that came pretty close to what we wanted it to do, but we found that it managed to mess up somewhere along the way. We came to the conclusion that it might be best to just scan continuously within a certain amount of distance traveled (without bumping into an object).
* Our debug demo consisted of us showing what we did to debug our code during the progress of navigating around objects. Since we continuously scanned at certain points, this gave us an opportunity to reprint each datapoint that the robot was gathering to better understand what went wrong. For instance, if a number was way off on the distance or a certain angle was wrong, then we could easily analyze and go through why the robot was possibly collecting that information differently than expected.

1. **LAB RETROSPECTIVE**

Take 10-15 minutes and answer these questions as you think about your lab experience. You don’t need to describe everything, try to pick something notable.

1. What did we set out to do?

* We set out to have the robot locate an object and move towards it without running into any objects (including the one it located) and navigate around them.

1. What actually happened?

* There was a lot of trial and error that we ran into especially with putty and the robot not properly coordinating with the program (this includes continuous restarting of either the sim or ccs).
* Other than the numerous problems that occurred while testing and debugging some of the ideas presented worked as expected.

1. Why did it happen?

* We assume that some of the crazy errors that occurred during debugging was due to how we implemented some functions within the main c file and also how we implemented the movement function.

1. What are we going to do next time (to improve)?

* Next time, we will continually optimize the code that we currently presented and add in the 360 capabilities that were originally mentioned in the lab along with the optional tall objects checkpoint.