Lab Challenge 1

Mobility Challenge

In this challenge lab you will design and implement software to autonomously move the VEX EDR robot through a pre-defined labyrinth.
In regular times, the program will be loaded into the VEX robot. For online class, you will need to setup the VEX Virtual Environment to create the labyrinth and run your program on the virtual robot. Check the following links for more information:
http://www.robotc.net/download/rvw/step1-rvw-intro.php

LEARNING OUTCOMES

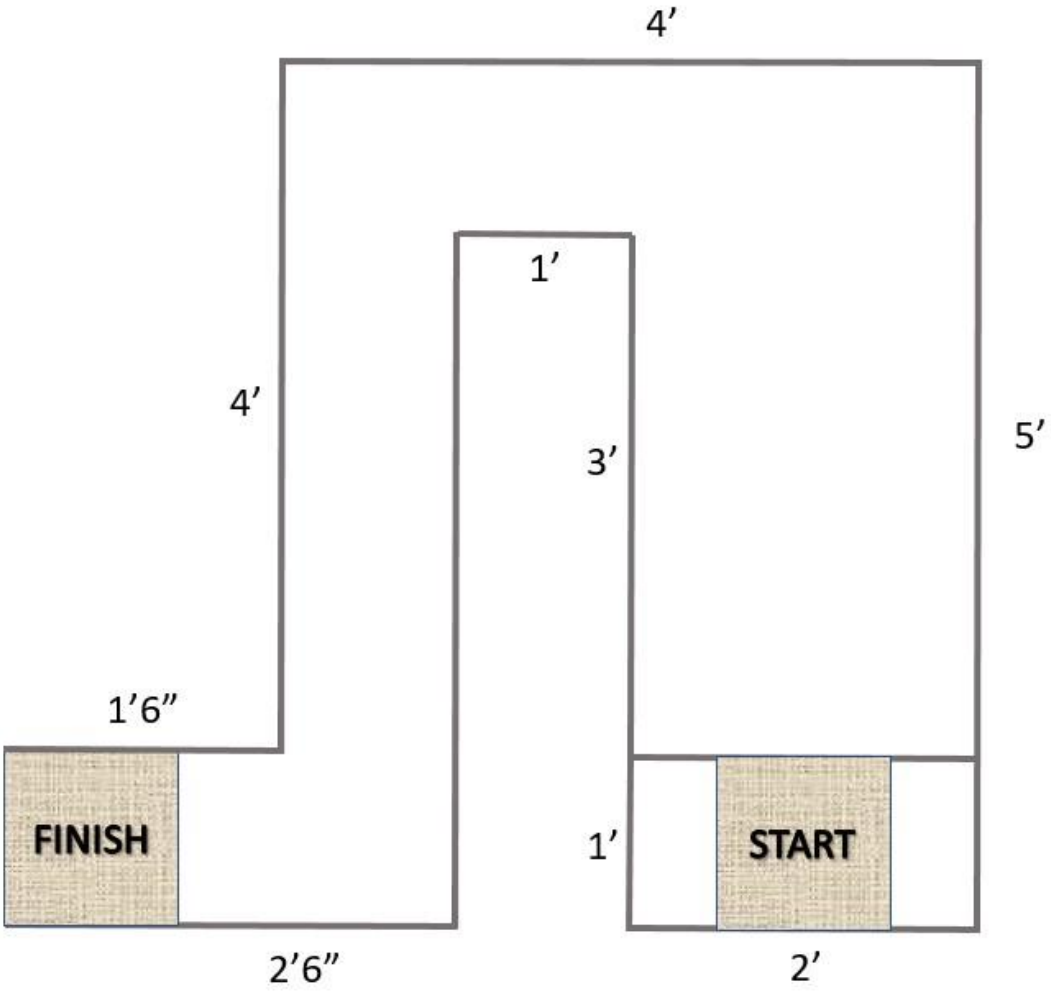
Upon successful completion of this challenge lab, you will have demonstrated the ability to:

- Create and load an autonomous application using RobotC on the VEX EDR Cortex controller
- Implement the concept of mobility
- Use Integrated Encoder Modules to track accuracy within robotic mobility

SPECIFICATIONS

Your task is to write an autonomous software application using RobotC that will successfully navigate a Labyrinth course. The robot should start at the starting point and stop at the end point. You are free to choose your start and end points.
The robot must first begin at the starting point and get to the goal area by completing turning and forward movement behaviors.
You are not allowed to control the robot in any way once the program has started. You robot must be programmed to stay within the lines of the Labyrinth.
You are free to be creative designing your labyrinth. However, it must follow the base design provided below as a reference.

The base design of the Labyrinth will be as follows:



SUBMISSION REQUIREMENTS

Once you have completed your lab upload your RobotC source file together with a video of your robot completing the task within the simulated environment to the Blackboard Lab Challenge 1 submission link under the Assignments page.

Also include a flow chart of your SW detailed design with standard symbols.
https://en.wikipedia.org/wiki/Flowchart

Bonus activities:

1. Use the wheel encoders to exactly track the movement (forward) and turnings
2. Use the touch sensor as a safety to kill the power if a collision occurs
3. Use the sonar sensor to automate the movement
4. Implement a search algorithm to find the path without any assumption on the road