Lab 4: Week 5

Due on 5/6/2020 at 5 PM.

This Lab assignment and has three questions. All questions carry equal marks.

Read the instructions carefully.
- Provide solutions to written questions in a single PDF file. In the title page of this document, identify group members, their affiliations, and percentage-wise contribution.
- Use separate c files for programming questions with filenames in the form Qnm.c, where n is the question number and m, is the part number.
  - E.g., **Q1b.c** is the solution file for the Q1 part b programming question.
- **Zip** your solution files in a file named Gn.zip where n is the group number and upload on D2L. Upload only one solution per group.
  - E.g., G3.zip is the solution by group 3.

Q1: Complete Q4-a of Lab 1 using a finite state machine-based approach.

a) You are provided with an incomplete state diagram (see Figure 1). Complete the state diagram with the conditionals that determine the arrows to self. Include your solutions in the accompanying PDF.
b) Using pseudocode to organize the state machine implementation, identify how you can sense the rotation of the robot, control the rotation of the robot.
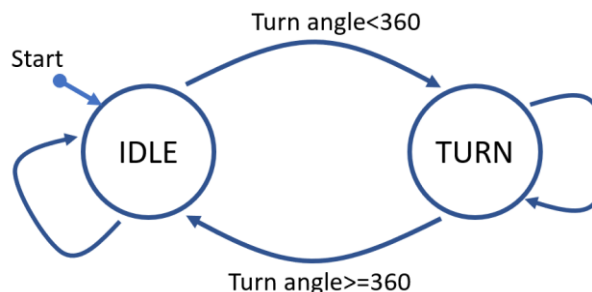c) Write the RobotC program to implement the state machine and include it with your submission.

Figure 1: Turn 360 degrees clockwise then display the time taken.

Q2. Similarly, complete Q5-a of Lab 1 using finite state machines.

    a) Complete the state diagram shown in Figure 2. Submit your solutions in the accompanying PDF.

    b) Implement the state machine as a RobotC program and include the code file with your submission.
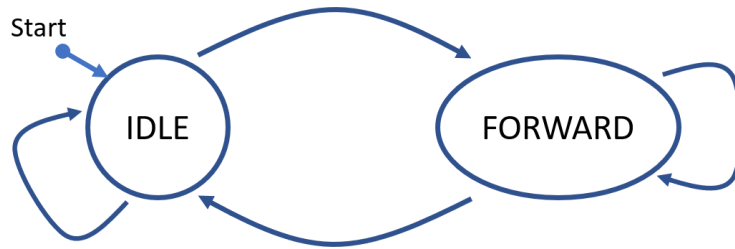

Figure 2: Move 100 cm forward then display the time taken.

Q3. Use state machines to solve the Sensabot challenge you completed in the GLE assignment 3.

    a) Draw a state machine that solves this challenge. Identify the states and the variables. Include the solution in your report.

    b) Implement the state machine as a RobotC program.