CSCE 274 – Robotics
Fall 2015 – Project 02

Assigned: October 27
Due: November 5

The purpose of this assignment is to give you some practice using the serial interface of the Create robots, and some experience with the reactive control architecture.

Task 1

Write a program to monitor some of the robot's sensor values.

1. Read the robots battery charge, its wall signal, and its four cliff sensor signal values. (Each of these should be an unsigned 16-bit integer.)
2. Read all of the sensor in **Group Packet ID # 3** (Packets 21-26).
3. Display those sensor values in a human-readable format, identified with English text strings, on the workstation's screen. (You'll need to run our `serial-dump` program or something similar on your workstation to read and display these values.)
4. Repeat once per second.

Task 2

Write a program that responds to input from the remote control and moves the robot accordingly.

1. When the robot receives a forward, left, or right signal from the remote, it should drive forward or rotate in place 30° as needed. Otherwise, the robot should not move.
2. However, the robot should refuse to do anything unsafe. For example, when either bumper is pressed or any of the cliff sensors are triggered, the robot should refuse to drive forward, but can still safely rotate. On the other hand, if any of the wheeldrop sensors are triggered, neither forward motion nor rotations are safe, because the robot is not resting properly on the ground.

Comments

- You should submit two separate programs.
- Your code should have exactly one function that implements each of the Create commands that you use. These functions should be stored in a separate file from you `main` function.

Disclaimers:

Moving forward I will be **much** more stringent when grading your submissions.

CSCE 274 – Project 02 Cover Sheet – Team _____

Team number: _____
Names:

_____

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Task 1 functionality (30):

- ☐ Request sensor values from robot.
- ☐ Assemble returned bytes into 16-bit integer.
- ☐ Request sensor values from group packet #3.
- ☐ Display strings on workstation.
- ☐ Display integers on workstation.
- ☐ Repeat.

Task 2 functionality (30):

- ☐ Read appropriate sensors.
- ☐ Respond to forward commands.
- ☐ Respond to left commands.
- ☐ Respond to right commands.
- ☐ Enforce safety constraints.
- ☐ Robot never grinds motors.
- ☐ Robot never drives off cliffs.

Style (20):

- ☐ One function per command?
- ☐ Separate file?
- ☐ No duplication of executable code?
- ☐ No magic numbers?
- ☐ Names match functionality?
- ☐ Adequate comments?
- ☐ Comments match code?
- ☐ Consistent formatting?

Documentation (20):

- ☐ Report is complete and clear?
- ☐ Required sections exist?
- ☐ Free of typos and grammatical errors?

Other comments:

Total: