CSCE 274

Section 001

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Project 1

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Description of the Task

In Project 1, the Create2 had to perform the tasks of driving in a pentagon when the clean button was pressed. The robot then had to check for another button presses while drawing the pentagon. To successfully perform these tasks, we created 2 interfaces and a main file. The file connection_interface.py was implemented to establish a serial connection with the robot, and to send and reads data robot data. It then closes the connection when finished. The state_interface.py file was implemented to control the robot's current state and future state. This interface contained methods that read for button presses and also contained a method with a drive command which accepted velocity and radius arguments. We used a method named drive_formatting to format this data from signed decimal input into hex and then back into a character string of bytes which were passed to the robot to execute the command . Lastly, the main.py file initializes the Create2 and uses the two interfaces. It listens for button presses, and if a button press is recognized, the robot begins drawing a pentagon with 30 cm edges. While the robot is drawing the pentagon, it continuously looks for more button presses. If a button is pressed while the Create2 is in the middle of drawing the pentagon, it stops at the next vertex and waits until it senses another button press.

Evaluation

Our program successfully drew the pentagon. The system using interfaces to separate tasks means that our code will be easy to adapt to future tasks and even to different hardware if that were

necessary. The most challenging part of the assignment was trying to get it to read button presses while driving. We faced difficulties in doing this, but eventually solved the problem by using threading to run two processes simultaneously, and in interrupt which would trigger the start of the drive command, while allowing a separate thread to continue listening for additional presses of the button. After fixing that minor issue, our programs ran efficiently, and the Create2 read all button presses during while drawing the pentagon and successfully completed the pentagon without any problems.

Allocation of Effort

Curtis: Wrote the front end (main.py). Debugged and tested the front end and the interfaces.

Dallin: Wrote the back end interfaces. Assisted Curtis in debugging and testing.

John: Wrote the report. Contributed to testing and brainstorming.