piRover Builds with K2

Drive Interface Design Rev 1.0

Goal:

Part 1 is a group activity where you will discuss and define an interface for your piRover motion. First you will discuss the action the user will take using the keyboard to enter drive commands. You will need to specify keyboard inputs required for each motion listed in Table 1. Additionally, you will need to consider keystrokes required to control the speed of the motion.

In part 2, you will create the Python program that will capture the inputs specified in part 1 and simply print a message indicating the type of motion and speed that is being requested.

In part 3, you will create a piRoverDrive.py file that contains the definitions for the motion functions that include speed. You will not implement the motion function at this point, just defined the function and use a print statement as an output to the terminal window verifying with the function has been called.

Prerequisites:

This assessment requires content and code solutions from the following:

- User Move
- PWM Introduction

Performance Outcomes:

1. Design a keyboard interface for piRover motion that includes speed.
2. Create user input and selection code that implements interface design.
3. Create piRover Drive function “stubs” that define functions but do not implement piRover motion.

Resources:

1. See prerequisite lessons

Materials:

1. piRover

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Set Up

1. Prepare your workspace for this project.
    a. Connect to your piRover using VNC. Access your piRover folder and launch VS Code.
    b. Create a **10.KeyboardDriveDesign** directory.
    c. Create a new **keyboard_drive.py** file in the 10.KeyboardDriveDesign directory.
    d. Create a new **piRover_drive_fake.py** file in the 10.KeyboardDriveDesign directory.

Part 1 – Keyboard Interface Design

1. Your task is to work with your group to define a keyboard interface for piRover motion.
2. Review the required motions in table 1 and consider that speed must be controlled during each motion.
3. Discuss with your group the use of the input() function and how keystrokes along with the Enter Key can be used to create a drive interface. Enter the keyboard input required for each motion. Be sure to incorporate speed control in your interface.

Table 1

Drive Interface Requirements
Forward
Backward
Left Turn
Left Rotate
Left Pivot Back
Right Turn
Right Rotate
Right Pivot Back
Stop
Accelerate
Decelerate

4. Enter your moves in column 1 of table 2. These can be a copy of table 1 requirement or something more complex. You must include all motion and speed requirements in table 1.
5. Enter the key input required for the movement identified. Discuss specifics with your group. How will keys and either single or multiple input() statements be used to create specified motions.

Table 2

Movement	Keyboard Input	Function Call(s)
(sample only) Forward	W	Forward()

6. Create and list the required drive methods. Work to create good naming and specify the parameters to be used (see sec parameter in motor control intro activity)

Part 2 – Keyboard Drive

7. Create the **keyboard_drive.py** code that does the following
   a. Provides the list of commands to the user
   b. Captures the command
   c. Use a selection structure to print an appropriate movement action.
   d. No move action is required. This comes later.

Part 3 – Drive Fake

8. Create the **piRover_drive_fake.py** code that does the following
   a. Defines the motion functions required for table 2.
   b. Use parameters as required.
   c. Create good naming of functions and parameters.
   d. Use print statements to display the movement action.
   e. No move action is required. This comes later.

Submission:

9. Submit this document with Table 2 along with keyboard_drive.py and piRover_drive_fake.py to the Moodle site.