PI bot LCD display menu specifications

Adafruit 16x2 Character LCD + Keypad for Raspberry pi

Library: Adafruit\_Python\_CharLCDPlate

The menu will have to be able to both display information as well as receive commands from the LCD terminal in order to both shutdown and indicate what information is to be displayed. All information displayed on screen must fit within 32 characters separated into two sixteen character lines capable of displaying any standard Roman font letter.

The display menu must be capable of displaying the following: individual motor speed, individual encoder information, Battery level, Battery voltage (both main and logic Battery levels).

The display must also be capable of shutting down the raspberry pi’s OS.

The format of the menus to be described here is the following:

|C|C|C|C|C|C|C|C|C|C|C|C|C|C|C|C|

|C|C|C|C|C|C|C|C|C|C|C|C|C|C|C|C|

BUTTON: # Title

BUTTON: # Title

Where each |C| represents a cell on the LCD which can display only a single character on screen, and each BUTTON: # Title represents which sub-menu will be entered if the corresponding button is pressed. If a button is not specified then nothing should occur.

The way the menu is designed is so that all of the branching decisions are used either using the up or down buttons while right and left will return the user exactly one level above. At all levels of the menu the select button should return the user to the main menu.

1) Main screen:

|\_|\_|\_|\_|\_|S|T|A|T|U|S|\_|\_|\_|\_|\_|

|\_|\_|\_|\_|\_|I|N|P|U|T|\_|\_|\_|\_|\_|\_|

BOTTOM: #2 Input

TOP: #3 Status Screen

SELECT: #11 Shutdown Confirmation

2) Input:

The way that the status screens will be arranged is so that there will be multiple which the user can browse through using the LEFT and RIGHT buttons starting at the Track Select and will utilize the down button to select the current category. If one wishes to add more ways to input information to the robot then they should enter the sub-menu through here.

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|<|-|\_|\_|\_|\_|T|R|A|C|K|\_|\_|\_|-|>|

Sub-menu: #10 Track Selection

LEFT, RIGHT: Switch between sub-menus

DOWNL: select the sub-menu to be displayed

SELECT: #1 Main Screen

3) Status Screen:

The way that the status screens will be arranged is so that there will be multiple which the user can browse through using the LEFT and RIGHT buttons starting at the Battery selector and will utilize the down button to select the current category. If one wishes to add more information to be displayed then they should enter the display screen using this menu.

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|<|-|\_|\_|B|A|T|T|E|R|Y|\_|\_|\_|-|>|

Sub-Menu: #5 Battery

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|<|-|\_|\_|\_|M|O|T|O|R|S|\_|\_|\_|-|>|

Sub-Menu: #4 Motors

SELECT: #1 Main Menu

RIGHT, LEFT: switch between categories

DOWN: select the current category

RIGHT, LEFT: #1 Main Menu

4) Motors

|\_|\_|\_|\_|\_|S|P|E|E|D|\_|\_|\_|\_|\_|\_|

|\_|\_|\_|\_|E|N|C|O|D|E|R|S|\_|\_|\_|\_|

RIGHT, LEFT: #3 Status Screen

TOP: #9 Speed

DOWN: #8 Encoders

SELECT: #1 Main Menu

5) Battery

|\_|\_|\_|\_|\_|L|E|V|E|L|\_|\_|\_|\_|\_|\_|

|\_|\_|\_|\_|V|O|L|T|A|G|E|\_|\_|\_|\_|\_|

UP: #6 Level

DOWN: #7 Voltage

SELECT: #1 Main Menu

6) Level

The battery level is to be displayed on the bottom left corner of the screen.

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

UP: #5 Battery

SELECT: #1 Main Menu

7) Voltage

The information to be displayed is the main and logic voltages. There should be one space between the label and the voltage to be displayed on screen,

|M|A|I|N|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|L|O|G|I|C|:|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

UP: #5 Battery

SELECT: #1 Main Menu

8) Encoders

This screen is meant to reed directly from the encoders regarding how many revolutions have been completed and the text is to appear one space after the “RIGHT: “, and “LEFT: “, texts leaving one black space in between.

|R|I|G|H|T|:|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|L|E|F|T|:|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

SELECT: #1 Main Menu

UP: #4 Motors

9) Speed

This screen is meant to be able to directly measure the speed at which the two separate powered wheels are running. This information will appear immediately after the labels of “RIGHT: “ and “LEFT: “ with one space immediately after the colon.

|R|I|G|H|T|:|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|L|E|F|T|:|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

SELECT: #1 Main Menu

RIGHT, LEFT: #4 Motors

SELECT: #1 Main Menu

10) Track Selection

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|L|E|F|T|\_|\_|\_|\_|\_|\_|\_|R|I|G|H|T|

LEFT: The left track is selected

RIGHT: The right track is selected

TOP: #2 Input

SELECT: #1 Main Menu

11) Shut Down

|\_|T|O|\_|C|O|N|F|I|R|M|\_|\_|\_|\_|\_|

|S|H|U|T|D|W|N|\_|P|R|E|S|S|\_|U|P|

SELECT, LEFT, RIGHT, DOWN: #1 Main Menu

TOP: OS shuts down

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|

|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|\_|