

Programming Assignment #2 - CapSense String Manipulation

CSE30 - Computer Organization and Systems Programming

Winter 2011

Overview

The goal of this assignment is to learn how to use the CapSense as input and gain an understanding of C strings. You will enter in words using the CapSense as a controller, store them, and perform some string manipulation on them.

Project Description

Display Mode:

You will have the ability to store and manipulate three strings. These are accessed and displayed on the LCD by pressing CapSense slider buttons P0_1, P0_2 and P0_3 corresponding to Strings 1, 2 and 3, respectively. The LCD should display the following:

```
Line 1 of LCD : String <number>
Line 2 of LCD : <String contents>
```

Therefore, pressing P0_1 will display on the LCD:

```
String 1
<Contents of string 1 (initially empty)>
```

Edit Mode:

You can edit a string by pushing CapSense button P0_0. Entering editing mode will perform the following actions:

1. LED1 should be turned on
2. LCD Line 1 should say "String <number> (Edit)"
3. The character 'A' is displayed on LCD Line 2

You enter the characters into the string by using CapSense buttons P0_5 and P0_6. Touching P0_6 will increment the character (e.g., from 'A' to 'B') while touching P0_5 will decrement the character (e.g., 'C' to 'B'). There should be only one character increment per press. The character should cycle through the alphabet, i.e., incrementing from 'Z' results in the 'A' and decrementing from 'A' results in 'Z'. Button P0_4 is used to commit the character and advance to the next. The next character displayed starts from the alphabet A. If the user enters more words that the size of the line, the recording positions should loop back to the first element, i.e., a string can not be longer than 16 characters. Pressing P0_0 while in edit mode will return display mode. This will turn off the LED. The string should be saved as it was input in edit mode.

1. There is no backspace function.
2. The old string is deleted when entering edit mode.
3. You only need to present characters A-Z as options. Lower case characters, numbers, space, etc. are not necessary.

Hints:

1. It is highly recommended that you do the example CapSense Cypress Lab (pg 144-154) in http://www.cse.ucsd.edu/~kastner/cse30/cypress_psoc_documentation.pdf. This will give show you how to set up the CapSense on your board.
2. Each component has a data sheet that describes, in a lot of detail, all the information about it including the API. These are useful to understand what different functions are doing.
3. Check the video (posted on moodle) showing the expected functionality if you have any questions on exactly how this should work.