

## **ECE597 Homework 2: LEDs and Etch-Sketch with buttons**

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### **Introduction**

The idea in this assignment was to make an introduction of the use of buttons and the ability of powering led, controlling them, using a beagle bone board. Having all the actions being fully successful without big problems.

### **Memorandum**

The first part of the assignment asked the students to Wire up 4 LEDs in the board and using 4 buttons, also in the board, control when the LED's should turn on and when it shut turn off. To accomplish this activity, I used for red LEDs, wired up with resistors and cables to the board, and I also wired up, only with cables, the 4 buttons on the board. One of the challenges on this part was to figure it out which pins of the board could be used as inputs.

After the structure phase of the activity, I had to develop a code that could deal with the buttons and it responses. So using the JavaScript language, I wrote an easy code that separately deal with LEDs as outputs of the board and /buttons as inputs of the board. This way, using interrupts with pull-up, every time that a button was pressed it call a function that would light up or turn off the Led depending on what the state of the LED.

One of the small details that this code brings is the fact that when you press a button it has a bouncing effect that makes the board think the user is pressing the buttons a lot of times. To deal with that I implemented an easy toggle conditional test, if the button was just press the systems is not going to repeat the action, only if is the 'first' time the button is pressed each time.

The second part of the assignment work with the code developed during the homework one, called Etch-Sketch. The idea behind the code is to draw Xs on the screen when the user moves the cursor on in. To do these moves, 4 buttons were implemented, being up, down, left and right. It has also a fifth button to clean the screen, resetting the game. In the same way as the LED part, I used JavaScript as programming language, and just adapted the code from the homework 1 to accept the buttons as inputs, using interrupts with pull downs.

Even though the buttons were an extra step comparing with the past homework, one of the most difficult parts of the assignment was to use subtle syntaxes of JavaScript, as an example, the function to print the matrix on the screen using console.log. This difficulty only appeared right now, because at the past assignment all the code was written in C and then now rewritten in JavaScript.

### **Conclusion**

The beagle bone has a quite simple and easy interface with external buttons and LEDs, choosing a programming language in that the developer has facility makes it even easier. Other thing that must be well observed, is which pins can be used for this interface, and where this information can be found.