College of Engineering
School of Aerospace Engineering

AE 6705: Introduction to Mechatronics

LAB3

Professor:
Jonathan Rogers
Gtech AE Professor

Student:
Tomoki Koike
Gtech MS Student

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Table of Contents

Question 1

Solution:
To allow a small arbitrary delay between releasing the switch and turning off the LED can be accomplished by including a delay loop like the following between the codes that detect the low input value at the pin for the switch and the function that turns the output pin of the LED from high to low or vice versa.

```
int i;
for(i = 0; i < 1000; i++){
}
```

Or alternatively we can make use of the `GPIO_enableInterrupt` and `GPIO_disableInterrupt` functions in the driverlib.h library. These functions can interrupt the pins on a certain port which can practically delay actions.

Question 2

Solution:
The potential issue of this program is the when pressing down on a mechanical switch a phenomenon called a switch bouncing occurs. This fluctuates the switch from high to low in a very low latency but will make the LED to blink (turn on and off) for a several times really quickly. To solve this, a time delay loop could be inserted in the beginning of the if statement or after the line that reads the input pin value from the switch as follows.

```
while(1){
    // Read button
    usiButton1 = MAP_GPIO_getInputPinValue(GPIO_PORT_P1, GPIO_PIN1);

    // Time delay
    int i;
    for(i = 0; i < 1000; i++){
    }

    // If button is pressed ...
    if(usiButton1 == GPIO_INPUT_PIN_LOW){
```

```
12          MAP_GPIO_toggleOutputOnPin(GPIO_PORT_P1, GPIO_PIN0);
13      }
14  }
```