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Github root directory: github.com/brian4280/bed_assign

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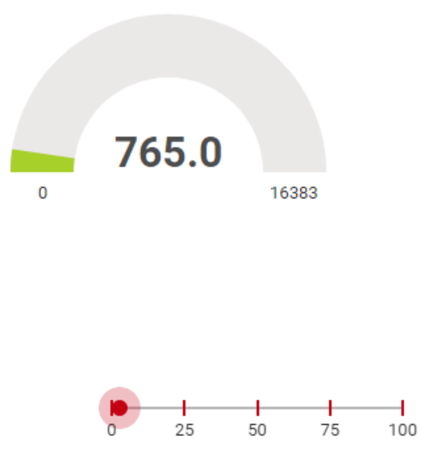
- Used the provided code to create a gui composer program that will show the ADC values along with being able to set the threshold inside the program.

Snapshot:



Task 01:

Youtube Link: https://www.youtube.com/watch?v=cKFi6iMaWVI

Modified Code:

```
/*
 * ======== empty.c ========
 */
/* For usleep() */
#include <unistd.h>
#include <stdint.h>
#include <stddef.h>
/* Driver Header files */
#include <ti/drivers/GPIO.h>
#include <ti/drivers/ADC.h>
#include <ti/display/Display.h>
// #include <ti/drivers/I2C.h>
// #include <ti/drivers/SDSPI.h>
// #include <ti/drivers/SPI.h>
// #include <ti/drivers/UART.h>
// #include <ti/drivers/Watchdog.h>
/* Board Header file */
#include "Board.h"
/* GLOBAL VARIABLES FOR GUI COMPOSER */
```

```
uint16_t adcValue = 0;
uint16_t threshold = 100;
uint16_t trigger = 0;
/*
 * ======== gpioButtonFxn0 ========
 * Callback function for the GPIO interrupt on Board_GPIO_BUTTON0.
 */
void gpioButtonFxn0(uint_least8_t index)
{
	/* Clear the GPIO interrupt and decrement threshold */
	if(threshold < 250){ // Ensure threshold doesn't go below zero
		threshold = 0;
	}
	else {
		threshold -= 250; // decrement by 250
	}
}

/*
 * ======== gpioButtonFxn1 ========
 * Callback function for the GPIO interrupt on Board_GPIO_BUTTON1.
 * This may not be used for all boards.
 */
void gpioButtonFxn1(uint_least8_t index)
{
	/* Clear the GPIO interrupt and increment threshold */
	if(threshold > 16133){ // Ensure threshold doesn't go above max ADC range
		threshold = 16383;
	}
	else {
		threshold += 250; // increment by 250
	}
}

/*
 * ======== mainThread ========
 */
void *mainThread(void *arg0)
{
	/* ~10 loops/second */
	uint32_t time = 100000;
	/* Call driver init functions */
	GPIO_init();
	ADC_init();
	// I2C_init();
	// SDSPI_init();
	// SPI_init();
	// UART_init();
	// Watchdog_init();
	/* Open Display Driver */
	Display_Handle displayHandle;
	Display_Params displayParams;
	Display_Params_init(&displayParams);
	displayHandle = Display_open(Display_Type_UART, NULL);
	/* Open ADC Driver */
```

Grading scheme: 30% Coding, 30% Documentation, 40% Execution/Video.

```
        ADC_Handle adc;
        ADC_Params params;
        ADC_Params_init(&params);
        adc = ADC_open(Board_ADC0, &params);
        if (adc == NULL) {
                // Error initializing ADC channel 0
                while (1);
        }
        GPIO_setCallback(Board_GPIO_BUTTON0, gpioButtonFxn0);
        GPIO_setCallback(Board_GPIO_BUTTON1, gpioButtonFxn1);
        /* Enable interrupts */
        GPIO_enableInt(Board_GPIO_BUTTON0);
        GPIO_enableInt(Board_GPIO_BUTTON1);
        while (1) {
                int_fast16_t res;
                res = ADC_convert(adc, &adcValue);
                if (res == ADC_STATUS_SUCCESS) {
                        Display_printf(displayHandle, 1, 0, "ADC Reading %d", adcValue);
                        if(adcValue >= threshold){
                                GPIO_write(Board_GPIO_LED0, Board_GPIO_LED_ON);
                                trigger = 1;
                        }
                        else{
                                GPIO_write(Board_GPIO_LED0, Board_GPIO_LED_OFF);
                                trigger = 0;
                        }
                }
                usleep(time);
        }
}
```

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