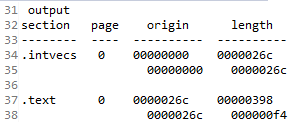
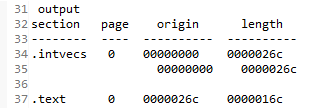
**Lab04**

**Date Submitted: 9/28/2019**

**Task 00: Execute provided code**

**Youtube Link: No submition required**





**------------------------------------------------------------------------------------**

**Task 01:**

Youtube Link: https://www.youtube.com/watch?v=ZW2YWbb6gsc

**Modified Schematic (if applicable): N/A**

**Modified Code:**

**// Insert code here**

**#include** <stdint.h>

**#include** <stdbool.h>

**#include** "inc/hw\_memmap.h"

**#include** "inc/hw\_types.h"

**#include** "driverlib/debug.h"

**#include** "driverlib/sysctl.h"

**#include** "driverlib/adc.h"

**#define** TARGET\_IS\_BLIZZARD\_RB1

**#include** "driverlib/rom.h"

**#include** "driverlib/gpio.h"

**int** **main**(**void**)

{

uint32\_t ui32ADC0Value[4];

**volatile** uint32\_t ui32TempAvg;

**volatile** uint32\_t ui32TempValueC;

**volatile** uint32\_t ui32TempValueF;

ROM\_SysCtlClockSet(SYSCTL\_SYSDIV\_5|SYSCTL\_USE\_PLL|SYSCTL\_OSC\_MAIN|SYSCTL\_XTAL\_16MHZ);

ROM\_SysCtlPeripheralEnable(SYSCTL\_PERIPH\_GPIOF);

ROM\_GPIOPinTypeGPIOOutput(GPIO\_PORTF\_BASE, GPIO\_PIN\_2);

ROM\_SysCtlPeripheralEnable(SYSCTL\_PERIPH\_ADC0);

ROM\_ADCHardwareOversampleConfigure(ADC0\_BASE, 64);

ROM\_ADCSequenceConfigure(ADC0\_BASE, 1, ADC\_TRIGGER\_PROCESSOR, 0);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE, 1, 0, ADC\_CTL\_TS);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE, 1, 1, ADC\_CTL\_TS);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE, 1, 2, ADC\_CTL\_TS);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE,1,3,ADC\_CTL\_TS|ADC\_CTL\_IE|ADC\_CTL\_END);

ROM\_ADCSequenceEnable(ADC0\_BASE, 1);

**while**(1)

{

ROM\_ADCIntClear(ADC0\_BASE, 1);

ROM\_ADCProcessorTrigger(ADC0\_BASE, 1);

**while**(!ROM\_ADCIntStatus(ADC0\_BASE, 1, false))

{

}

ROM\_ADCSequenceDataGet(ADC0\_BASE, 1, ui32ADC0Value);

ui32TempAvg = (ui32ADC0Value[0] + ui32ADC0Value[1] + ui32ADC0Value[2] + ui32ADC0Value[3] + 2)/4;

ui32TempValueC = (1475 - ((2475 \* ui32TempAvg)) / 4096)/10;

ui32TempValueF = ((ui32TempValueC \* 9) + 160) / 5;

**if**(ui32TempValueF > 72)

ROM\_GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_2, 4);

**else**

ROM\_GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_2, 0);

}

}

**------------------------------------------------------------------------------------**

**Task 02:**

Youtube Link: https://www.youtube.com/watch?v=4SAkqo-s77E

**Modified Schematic (if applicable): N/A**

**Modified Code:**

**// Insert code here**

**#include** <stdint.h>

**#include** <stdbool.h>

**#include** "inc/tm4c123gh6pm.h"

**#include** "inc/hw\_memmap.h"

**#include** "inc/hw\_types.h"

**#include** "driverlib/debug.h"

**#include** "driverlib/sysctl.h"

**#include** "driverlib/adc.h"

**#define** TARGET\_IS\_BLIZZARD\_RB1

**#include** "driverlib/rom.h"

**#include** "driverlib/gpio.h"

**#include** "driverlib/timer.h"

**#include** "driverlib/interrupt.h"

**int** **main**(**void**)

{

uint32\_t ui32ADC0Value[4];

**volatile** uint32\_t ui32TempAvg;

**volatile** uint32\_t ui32TempValueC;

**volatile** uint32\_t ui32TempValueF;

ROM\_SysCtlClockSet(SYSCTL\_SYSDIV\_5|SYSCTL\_USE\_PLL|SYSCTL\_OSC\_MAIN|SYSCTL\_XTAL\_16MHZ);

ROM\_SysCtlPeripheralEnable(SYSCTL\_PERIPH\_GPIOF);

ROM\_GPIOPinTypeGPIOOutput(GPIO\_PORTF\_BASE, GPIO\_PIN\_2);

**SysCtlPeripheralEnable**(SYSCTL\_PERIPH\_TIMER1);

**TimerConfigure**(TIMER1\_BASE, TIMER\_CFG\_PERIODIC);

ROM\_SysCtlPeripheralEnable(SYSCTL\_PERIPH\_ADC0);

ROM\_ADCHardwareOversampleConfigure(ADC0\_BASE, 32);

ROM\_ADCSequenceConfigure(ADC0\_BASE, 1, ADC\_TRIGGER\_PROCESSOR, 0);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE, 1, 0, ADC\_CTL\_TS);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE, 1, 1, ADC\_CTL\_TS);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE, 1, 2, ADC\_CTL\_TS);

ROM\_ADCSequenceStepConfigure(ADC0\_BASE,1,3,ADC\_CTL\_TS|ADC\_CTL\_IE|ADC\_CTL\_END);

ROM\_ADCSequenceEnable(ADC0\_BASE, 1);

uint32\_t ui32Period = ((**SysCtlClockGet**())\*50) /100;

**TimerLoadSet**(TIMER1\_BASE, TIMER\_A, ui32Period -1);

**IntEnable**(INT\_TIMER1A);

**TimerIntEnable**(TIMER1\_BASE, TIMER\_TIMA\_TIMEOUT);

**IntMasterEnable**();

**TimerEnable**(TIMER1\_BASE, TIMER\_A);

**while**(1)

{

**while**(!ROM\_ADCIntStatus(ADC0\_BASE, 1, false))

{

}

ROM\_ADCSequenceDataGet(ADC0\_BASE, 1, ui32ADC0Value);

ui32TempAvg = (ui32ADC0Value[0] + ui32ADC0Value[1] + ui32ADC0Value[2] + ui32ADC0Value[3] + 2)/4;

ui32TempValueC = (1475 - ((2475 \* ui32TempAvg)) / 4096)/10;

ui32TempValueF = ((ui32TempValueC \* 9) + 160) / 5;

**if**(ui32TempValueF > 72)

ROM\_GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_2, 4);

**else**

ROM\_GPIOPinWrite(GPIO\_PORTF\_BASE, GPIO\_PIN\_2, 0);

}

}

**void** **Timer1IntHandler**(**void**)

{

// Clear the timer interrupt

**TimerIntClear**(TIMER1\_BASE, TIMER\_TIMA\_TIMEOUT);

// Read the current state of the GPIO pin and

// write back the opposite state

ROM\_ADCIntClear(ADC0\_BASE, 1);

ROM\_ADCProcessorTrigger(ADC0\_BASE, 1);

}

**------------------------------------------------------------------------------------**