Temple University

College of Engineering

Department of Electrical and Computer Engineering (ECE)

Student Lab Report Cover Page

Course Number : 3613

Course Section : 002

Experiment # : Lab # 10

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TUid# : 915614617

Date : 11/4/2020

Grade : _____ **/100**

TA Name : Sung Choi

ACTIVITIES:

Show your code and video result.

Note: In the result video, you must show your face, code running on the Atmel Studio 7, the switch values, and the full results for all cases.

Activity 1

1. Code and Description

Code with Full-Comment:

```
//Robert Bara Lab 10
//Activity 1 example. Checking PB0, LED blinking with 0.5 and 1 sec delay
#include <avr/io.h>
#define F_CPU 16000000UL
#include <util/delay.h>     //Use built-in delay
//PB0=1, Switch Open
void bit0(void)
{
	PORTA=1; //0b00000001
	for(int i=0;i<8;i++) //bit0 to 7
	{	_delay_ms(500);
		PORTA=PORTA<<1;		//logical shift left so it shifts to each LED

	}
}
//PB0=0, Switch Closed
void bit1(void)
{
	PORTA=128; //0b10000000
	for(int i=0;i<8;i++)//bit 7 to 0
	{	_delay_ms(1000);
		PORTA=PORTA>>1;		//right shift the bit to change LEDs
	}
}
//Start Main function
int main(void)
{
    int i=0xff;
	DDRB |=0x00;  //configure the PB0 bit as input
	PORTB |=0XFF;                       //sets up pullup resistors
	DDRA |=0XFF;                        //configure portA as output
	//Keep checking PINB bit 0
	while (1)
	{
		if (PINB&0B00000001) //Check the bit 0 is not equal to 0
		{
			bit0();		//if PB0=1 or Switch Open

		}
		else
		{
```

```
                bit1();       //if PB0=0 or Switch Closed
            }
        }
}
```

2. Result

Result Video Link (The video must show the switch bit 0 value and the full LED bits that turn on one at a time. Check the resulting video provided for the operation.):
https://youtu.be/yiqFvNo1b5s

Activity 2

1. Code and Description

Code with Full-Comment:

```
//Activity 2 example
#include <avr/io.h>
#define F_CPU 16000000UL
#include <util/delay.h>

//7-SEGMENT DISPLAY PATTERNS
#define zero 0b00111111
#define one 0b00000110
#define two 0b01011011
#define three 0b01001111
#define four 0b01100110
#define five 0b01101101
#define six 0b01111101
#define seven 0b0000111
#define eight 0b01111111
#define nine  0b01100111
#define A     0b01110111
#define B       0b01111100
#define C       0b00111001
#define D       0b1011110
#define E       0B01111001
#define F     0B01110001

//START MAIN
int main(void)
{ //initializing inputs and outputs
       DDRB=DDRB&0b11110000;       //PORTB BIT 0,1,2,3 as input
       DDRA=0XFF;
       PORTB=0XFF;
       unsigned char x;            //assign a variable x
       while (1)
       {
              x = PINB;
              x = x & 0b00001111;  //masking the input
              switch(x)
              {
                     case 1:                     //PINB=1
                     PORTA=one;
                     break;
```

```
                        case 2:                     //PINB=2
                        PORTA=two;
                        break;
                        case 3:                     //PINB=3
                        PORTA=three;
                        break;
                        case 4:                     //PINB=4
                        PORTA=four;
                        break;
                        case 5:                     //PINB=5
                        PORTA=five;
                        break;
                        case 6:                     //PINB=6
                        PORTA=six;
                        break;
                        case 7:                     //PINB=7
                        PORTA=seven;
                        break;
                        case 8:                     //PINB=8
                        PORTA=eight;
                        break;
                        case 9:                     //PINB=9
                        PORTA=nine;
                        break;
                        case 10:                    //PINB=10
                        PORTA=A;
                        break;
                        case 11:                    //PINB=11
                        PORTA=B;
                        break;
                        case 12:                    //PINB=12
                        PORTA=C;
                        break;
                        case 13:                    //PINB=13
                        PORTA=D;
                        break;
                        case 14:                    //PINB=14
                        PORTA=E;
                        break;
                        case 15:                    //PINB=15
                        PORTA=F;
                        break;
                        default: PORTA=zero;
                        break;
                }
        }
        return 0;
}
```

2. Result

Result Video Link (Video showing your results of all cases.):

https://youtu.be/yiqFvNo1b5s Skip to (0:48)

ECE3613 Processor System Laboratory Rubric

Lab #: 10
Section: 001 / 002
Name: _____

Activity	Part	Contents	Full Points	Earned Points	Comment
1		Code	10		Code and Full Comments
	Video	Result PB0=0	20		
	Video	Result PB0=1	20		
	Subtotal		50		
2		Code	10		Code and Full Comments
		Result Video	40		2.5 points for each case
	Subtotal		50		
Total			**100**		