

CS224 / Lab 7.

Sec 2

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## **PART2\_B**

### **a) SFRs**

I-O Devices

A DC motor->PORTA, TRISA, LATA

2 Button Switches ->PORTE, TRISE, LATE

### **b) code**

```
#include <P32.xxx.h>
```

```
//DC motor
```

```
// J4: Control1 : 10, MOTOR1:3
```

```
// Control2 : 2, MOTOR2:6
```

```
//Push Buttons
```

```
//J1 Button0 : 1
```

```
// Button1 : 10
```

```
void main() {
```

```
AD1PCFG = 0xFFFF; // Configure AN pins as digital I/O
```

```
JTAGEN_bit = 0; // Disable JTAG
```

```
TRISE = 0xFFFF //portE inputs(switch buttons)
```

```
TRISA = 0x0000 //portA outputs for DC motor
```

```
LATA = 0xffff; //default values
```

```
LATE = 0x0000; //default values
```

```
while(1) {
```

```
if(PORTEbits.RB0 & PORTEbits.RB1) { //if you push two button at the same time, no turn
```

```
PORTAbits.CONTROL1 = 0;
```

```
PORTAbits.CONTROL2 = 0;
```

```
}
```

```

else{
    PORTAbits.CONTROL1 = PORTEbits.RB0; //if you push button 0(RB0) turn counter-
clockwise
    PORTAbits.CONTROL2 = PORTEbits.RB1; //if you push button 1(RB1) turn clockwise
}
}
}

```

## **PART2\_C**

### **c) SFRs**

I-O Devices

Seven Segment Module--> > D->TRISA, PORTA,

AN->TRISE, PORTE

### **d) code**

/\*

Configuration for the code below:

Connect portA to J1 Port of 4 Digit Seven Segment Module

Jumpers of portA are : 5V, pull down ( top one to left, other to right )

Connect portE to J2 Port of 4 Digit Seven Segment Module

Jumpers of portE are : 5V, pull down ( top one to left, other to right )

\*/

// Hexadecimal values for digits in 7 segment

unsigned char binary\_pattern[]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F};

void main() {

AD1PCFG = 0xFFFF; // Configure AN pins as digital I/O

JTAGEN\_bit = 0; // Disable JTAG

TRISA = 0x00; //portA is output to D

TRISE = 0x00; //portE is output to AN

int i = 1;

while(1)

{

//Digit1

```

PORTA=binary_pattern[i % 10];
PORTE=0x01;
Delay_ms(1);

// Digit 2
PORTA=binary_pattern[(i + 1) % 10]; // Put 2 to the second digit
PORTE=0x02; // Open second digit
Delay_ms(1);

// Digit 3
PORTA=binary_pattern[(i + 2) % 10];
PORTE=0x04;
Delay_ms(1);

// Digit 4
PORTA=binary_pattern[(i + 3) % 10];
PORTE=0x08;
Delay_ms(1);

Delay_ms(1000); // wait 1 second
i++;
}

} //main

```

## **PART2\_D**

### **e) SFRs**

I-O Devices

8 LED outputs → LATA , TRISA

3 Button Switches → PORTE, TRISE

### **f) code**

```
void main() {
```

```
AD1PCFG = 0xFFFF;
```

```
JTAGEN_bit = 0;
```

```
TRISA = 0; //PORTA is output for LEDs
```

```
TRISE = 1; //PORTE is input to read push-buttons
```

```
int speed = 1000; // one second (default), make it smaller for faster demonstration
```

```
Delay_ms(speed);
```

```
int c = 0 //counter
```

```
LATA = 0xffff; //LEDs off by default
```

```
LATE = 0x0000;
```

```
//Loop
```

```
while(1)//always keep going
```

```
{
```

```
    PORTE = 0x0000;//reset push-buttons
```

```
    if(PORTEbits.RF2 == 1)//reset is pressed
```

```
    {
```

```
        LATA = 0b11111111;
```

```
        c = 0;
```

```
        continue;
```

```
    }
```

```
//1 is pressed, 0 is unpressed
```

```
if(PORTEbits.RF0 == 1 && PORTEbits.RF1 == 1) //if both pressed, ignore
```

```
{
```

```
    continue;
```

```
}
```

```
else if(PORTEbits.RF0 == 1)//left to right (RF0 is pressed)
```

```
{
```

```
    LATA = c % 128;
```

```
    c++;
```

```
}
```

```
else if(PORTEbits.RF1 == 1)//right to left (RF1 is pressed)
```

```
{
```

```
    LATA.F0 = ((c % 128) & 0b10000000) != 0;
```

```
    LATA.F1 = ((c % 128) & 0b01000000) != 0;
```

```
    LATA.F2 = ((c % 128) & 0b00100000) != 0;
```

```
    LATA.F3 = ((c % 128) & 0b00010000) != 0;
```

```
    LATA.F4 = ((c % 128) & 0b00001000) != 0;
```

```
    LATA.F5 = ((c % 128) & 0b00000100) != 0;
```

```
    LATA.F6 = ((c % 128) & 0b00000010) != 0;
```

```
    LATA.F7 = ((c % 128) & 0b00000001) != 0;
```

```
    c++;
```

```
}
```

```
        Delay_ms(speed);  
    }  
} //end of main
```