

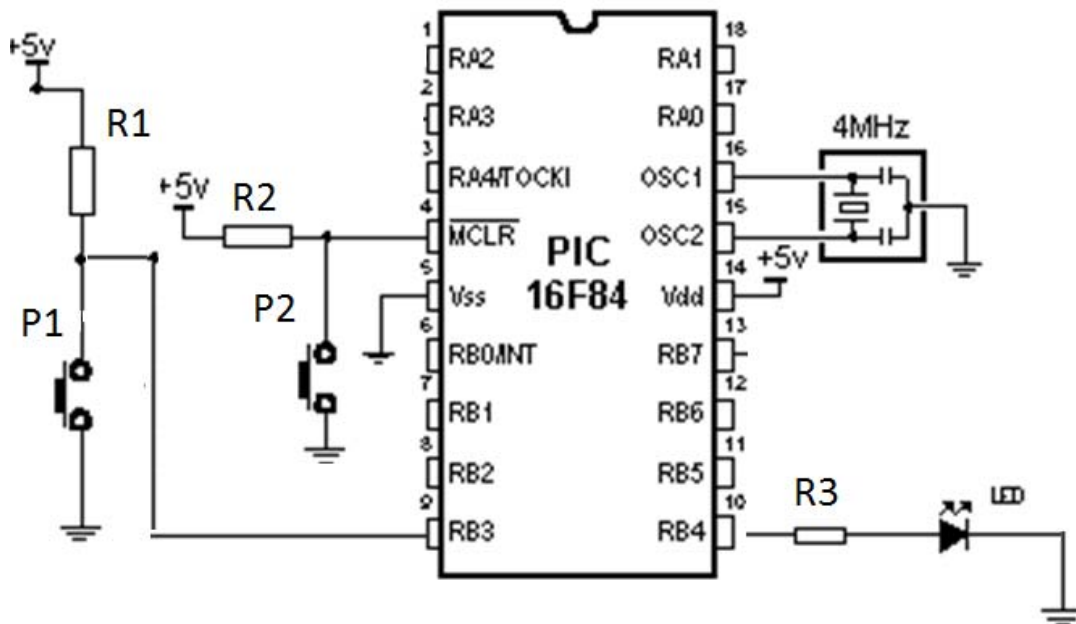
Course name: Practical App. CS II
 Course Code: -
 Lecturer: Dr. Ahmed ElShafee

Exam number: Midterm, model answer
 Exam Date: 21/04/2013
 Time Allowed: 60 minutes

Name: _____
 ID: _____

[1]	[2]	[3]	[4]	Total
/5	/2.5	/2.5	/10	/20

[1] for the following schematic PIC16f84A microcontroller, write an assembly program that makes the led flash when pressing the press button. Led becomes off when press button is released. Study the code below, and complete the "FLASH" subroutine. Use a pre-defined subroutine called "delay1S"



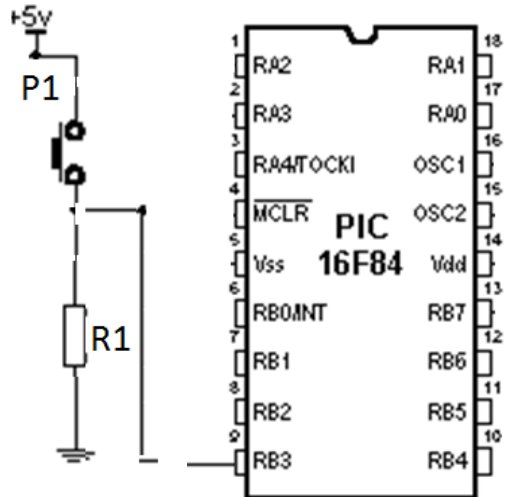


```
.ORG 000
    GOTO start
.org 004
    GOTO start
start:
    movlw b'00001111'
    Bsf STATUS, RP0
    movwf TRISB
    Bcf STATUS, RP0
loop:
    btfss PORTB,3
    goto FLASH
    BCF PORTB,4
    goto loop
```

FLASH:

```
btfsc PORTB,3
GOTO LOOP
bsf portb,4
CALL delay1S
BCF PORTB,4
CALL delay1S
GOTO FLASH
```

[2] complete the following table

Q	Answer
What is the value of R1	10K
R2	10K
R3	100
Redraw the press “P1” button connection to convert it from active low to active high →	
What would happen if you pressed “P2”?	Reset
What would be happened if you remove “P2”?	nothing

.....

.....

.....

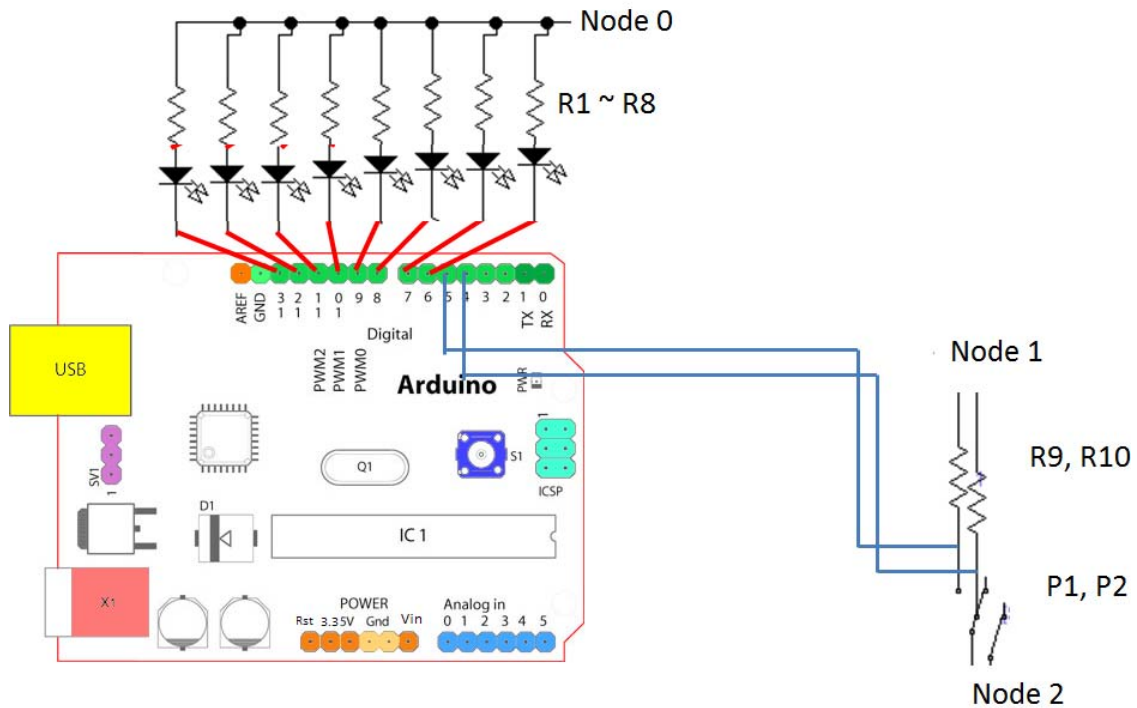
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[3] study the following Arduino MC board, then complete the following table



.....

Q	Answer
What is the value of R1~ R8	100
What is the value of R9~ R10	10K
Type pin name/number that would be connected to “node 0” to make led active low	5V
Type pin name/number that would be connected to “node 1” to make “P1”, “P2” active high	Gnd
Type pin name/number that would be connected to “node 2” to make “P1”, “P2” active high	5V

[4] write Arduino C program that make “P1” as “UP” button and ” P2” as “DOWN” button. Make leds acts as level indicator. When you press “UP” if all leds are off, “Led 13” will be on, after a10 milli seconds if “UP” button pressed again, then “Led 12” led will become on. Make sure if all leds are on, and “P1” is press nothing will happen. If you press “DOWN” button, and all leds are one, “Led 6” becomes off, if pressed again, “Led 5” becomes off. And so on till all leds become off. Make sure that if “DOWN” button is pressed and all leds are off, nothing will happen.

Study attached code below then write the missing functions “Increase”, and “Decrease”

<pre> #define Led7 13 #define Led6 12 #define Led5 11 #define Led4 10 #define Led3 9 #define Led2 8 #define Led1 7 #define Led0 6 #define up 5 #define down 4 int up_status=0; int down_status=0; int led7_status=0; int led6_status=0; int led5_status=0; int led4_status=0; int led3_status=0; int led2_status=0; int led1_status=0; int led0_status=0; void setup() { pinMode(Led0, OUTPUT); pinMode(Led1, OUTPUT); pinMode(Led2, OUTPUT); pinMode(Led3, OUTPUT); pinMode(Led4, OUTPUT); pinMode(Led5, OUTPUT); pinMode(Led6, OUTPUT); pinMode(Led7, OUTPUT); pinMode(up,INPUT); pinMode(down,INPUT); } </pre>	<pre> void loop() { up_status=digitalRead(up); if(up_status==LOW) { delay(100); up_status=digitalRead(up); if(up_status==LOW) { <u>Increase()</u>; } } down_status=digitalRead(down); if(down_status==LOW) { delay(100); down_status=digitalRead(down); if(down_status==LOW) { <u>Decrease()</u>; } } digitalWrite(Led0,led0_status); digitalWrite(Led1,led1_status); digitalWrite(Led2,led2_status); digitalWrite(Led3,led3_status); digitalWrite(Led4,led4_status); digitalWrite(Led5,led5_status); digitalWrite(Led6,led6_status); digitalWrite(Led7,led7_status); } </pre>
---	---



```
Void Increase(void)
```

```
{
```

```
Void Increase(void)
```

```
{
```

```
if(led6_status==HIGH)
```

```
    led7_status=HIGH;
```

```
else if(led5_status==HIGH)
```

```
    led6_status=HIGH;
```

```
else if(led4_status==HIGH)
```

```
    led5_status=HIGH;
```

```
else if(led3_status==HIGH)
```

```
    led4_status=HIGH;
```

```
else if(led2_status==HIGH)
```

```
    led3_status=HIGH;
```

```
else if(led1_status==HIGH)
```

```
    led2_status=HIGH;
```

```
else if(led0_status==HIGH)
```

```
    led1_status=HIGH;
```

```
else if(led0_status==LOW)
```

```
    led0_status=HIGH;
```

```
}
```

```
}
```



```
Void Decrease(void)
```

```
{
```

```
    if(led7_status==HIGH)
        led7_status=LOW;
    else if(led6_status==HIGH)
        led6_status=LOW;
    else if(led5_status==HIGH)
        led5_status=LOW;
    else if(led4_status==HIGH)
        led4_status=LOW;
    else if(led3_status==HIGH)
        led3_status=LOW;
    else if(led2_status==HIGH)
        led2_status=LOW;
    else if(led1_status==HIGH)
        led1_status=LOW;
    else if(led0_status==HIGH)
        led0_status=LOW;
```

```
}
```