HACETTEPE UNIVERSITY

COMPUTER SCIENCE DEPARTMENT

EMBEDDED SYSTEMS LAB.

LAB. REPORT 1

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i. Which part of the code turns on and off the LEDs?

```
55 int main(void){
56   PortF_Init();  // make PF1 out (PF1 built-in LED)
57   while(1){
58     GPIO_PORTF_DATA_R = 0x02;  // LED is red
59     Delay();
60     Led = GPIO_PORTF_DATA_R;   // read previous
61     Led = Led^0x02;            // toggle red LED, PF1
62     GPIO_PORTF_DATA_R = Led;   // output
63     Delay();
64     GPIO_PORTF_DATA_R = 0x04;  // LED is blue
65     Delay();
66     GPIO_PORTF_DATA_R = 0x00;  // LED is off
67     Delay();
68     GPIO_PORTF_DATA_R = 0x08;   // LED is green
69     Delay();
70     GPIO_PORTF_DATA_R = 0x00;  // LED is off
71     Delay();
72   }
73 }
74
```

Turn on the LEDs

Turn off the LEDs

ii. What is the purpose of Delay() function?

We use Delay() function in order to observe changes in LEDs' blinking.

iii. How can you make the LED flash slower? Which part of the code needs to change and how?

```
49 void Delay(void){unsigned long volatile time;
50   time = 145448*10;  // 0.1sec
51   while(time){
52     time--;
53   }
54 }
```

When we increase the time variable, LEDs flash slower

iv. From what you see in the code, how can you make the LED flash just one color, e.g. green?

```
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56   PortF_Init();  // make PF1 out (PF1 built-in LED)
57   while(1){
58     GPIO_PORTF_DATA_R = 0x02;  // LED is red
59     /*Delay();
60     Led = GPIO_PORTF_DATA_R;   // read previous
61     Led = Led^0x02;            // toggle red LED, PF1
62     GPIO_PORTF_DATA_R = Led;   // output
63     Delay();
64     GPIO_PORTF_DATA_R = 0x04;  // LED is blue
65     Delay();
66     GPIO_PORTF_DATA_R = 0x00;  // LED is off
67     Delay();
68     GPIO_PORTF_DATA_R = 0x08;   // LED is green
69     Delay();
70     GPIO_PORTF_DATA_R = 0x00;  // LED is off
71     Delay();*/
72   }
73 }
74
```

- Red LED is constantly on

```
55 int main(void){
56   PortF_Init();  // make PF1 out (PF1 built-in LED)
57   while(1){
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59     Delay();
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62     GPIO_PORTF_DATA_R = Led;   // output
63     Delay();
64     /*GPIO_PORTF_DATA_R = 0x04;  // LED is blue
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70     GPIO_PORTF_DATA_R = 0x00;  // LED is off
71     Delay();*/
72   }
73 }
74
```

- Red LED is blinking