Lab 5: Blink LED with a specific delay in 8051

1 Problem Statement

Write assembly an d C language program to:

1. Blink LEDs on Port 1 of 8051 with specific delay:
   (a) Write assembly language program to blink all four LEDs in P1.4 to P1.7 with approximate delay of 1s
   (b) Write C language program to blink all four LEDs in P1.4 to P1.7 with approximate delay of 1s
2. Blink a specific LED (LED 1,2,3 or 4):
   (a) Write assembly language program to blink any one of the LEDs among P1.4 to P1.7 such that it is turned ON for longer period and OFF for shorter period.
   (b) Write C language program to blink any one of the LEDs among P1.4 to P1.7 such that it is turned ON for longer period and OFF for shorter period.
3. Blink LEDs in sequence with specific delay:

2 Procedure

2.1 Sample codes in Assembly and C language to blink LEDs

Assembly code:

```
org 0H
ljmp main
org 100H
                ;upper nibble of Port p1 corresponds to LEDs and lower nibble of P1 corresponds to
                        Slider switches in Pt-51

                main:
                        mov p1, #0F0H   ;set or turn ON LED
                        acall delay     ;calling a delay of approx 1 sec from delay subroutine
                        mov p1, #000H   ;clear or turn OFF LED
                        acall delay     ;calling a delay of approx 1 sec from delay subroutine
                        sjmp main       ;short jump to main label to continue blinking

                ;code lines written below will generate some delay (approx 1 sec)

                delay:
                        mov R2,#255     ;move value 255 to register R2

                delay1:
                        mov R1, #255            ;move value 255 to register R2
                        here: djnz R1, here     ;decrement and jump if R1 not equal to zero to 'here'
                        djnz R2,delay1           ;decrement and jump if R2 not equal to zero to 'delay1'
                ret

end
```

Figure 1: Assembly code to blink all LEDs with approximately 1s delay

C code:

```
#include <AT89C513xA.h>

void delay(void);

          /*upper nibble of port p1 corresponds to LEDs and lower nibble of p1 corresponds
          to Slider    switches    in Pt-51*/

void main(void)
{
    while(1)
    {
         P1 = 0xF0; /* Turn ON all LED's*/
         delay();   /*Call delay*/
         P1 = 0x00; /* Turn OFF all LED's*/
         delay();   /*Call delay*/
    }
}

 /*delay for a specific period (approx 1s)*/
void delay(void)
{
    int i,j;
    for(i=0;i<0xff;i++)
         for(j=0;j<0xff;j++);
}
```

Figure 2: C code to blink all LEDs with approximately 1s delay