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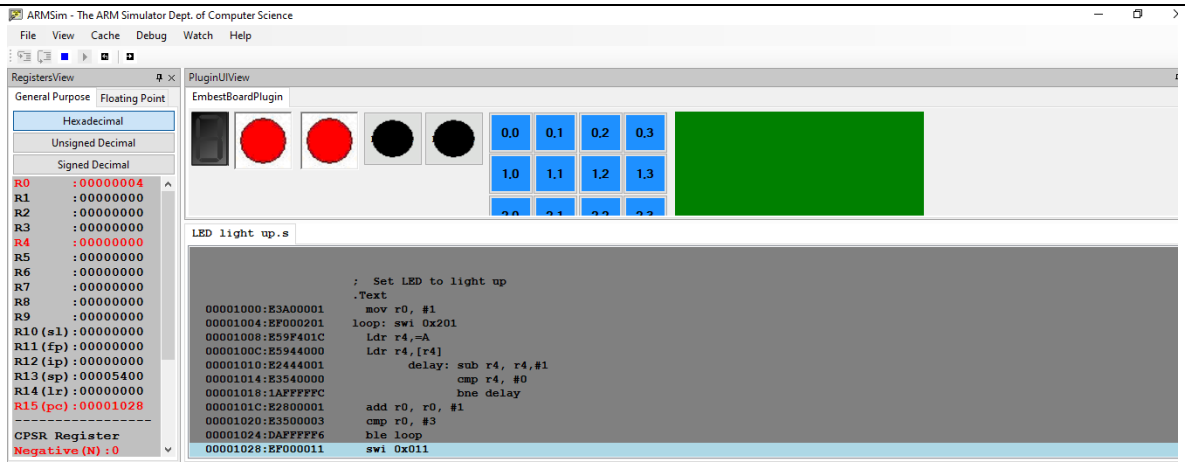
Microprocessor & Computer Architecture - UE20CS252

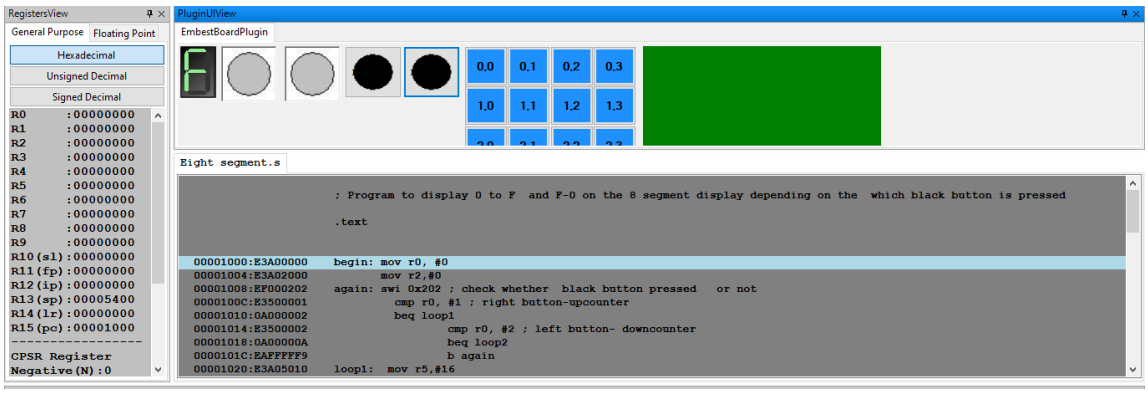
Sl. No	Programs
Week No.7	1. Demonstration of programs using plug-ins using ARMSIM. a. Set the LED to be light up. ***; Set LED to light up*** ***.Text*** ***mov r0, #1*** ***loop:*** ***swi 0x201*** ***Ldr r4,=A*** ***Ldr r4,[r4]*** ***delay:*** ***sub r4, r4,#1*** ***cmp r4, #0*** ***bne delay*** ***add r0, r0, #1*** ***cmp r0, #3*** ***ble loop*** ***swi 0x011*** ***.Data*** ***A:.word 84000***



b. Display hexadecimal digits [0-9,A-F] on the 8 segment display.

```
.text
begin:
        mov r0, #0
        mov r2,#0
again:
        swi 0x202 ; check whether  black button pressed   or not
        cmp r0, #1 ; right button-upcounter
        beq loop1
        cmp r0, #2 ; left button- downcounter
        beq loop2
        b again
loop1:
        mov r5,#16
    ldr r1,=zero
    back1:ldrb r0, [r1]
        swi 0x200   ; Set 8 segment display to light up
        bl delay
            add r1,r1,#1
            sub r5, r5,#1
            cmp r5, #0
            bne back1
            b again

loop2:
            mov r5,#16
            ldr r1,=F
            back2: ldrb r0, [r1]
            swi 0x200   ; Set 8 segment display to light up
            bl delay
            sub r1, r1, #1
```

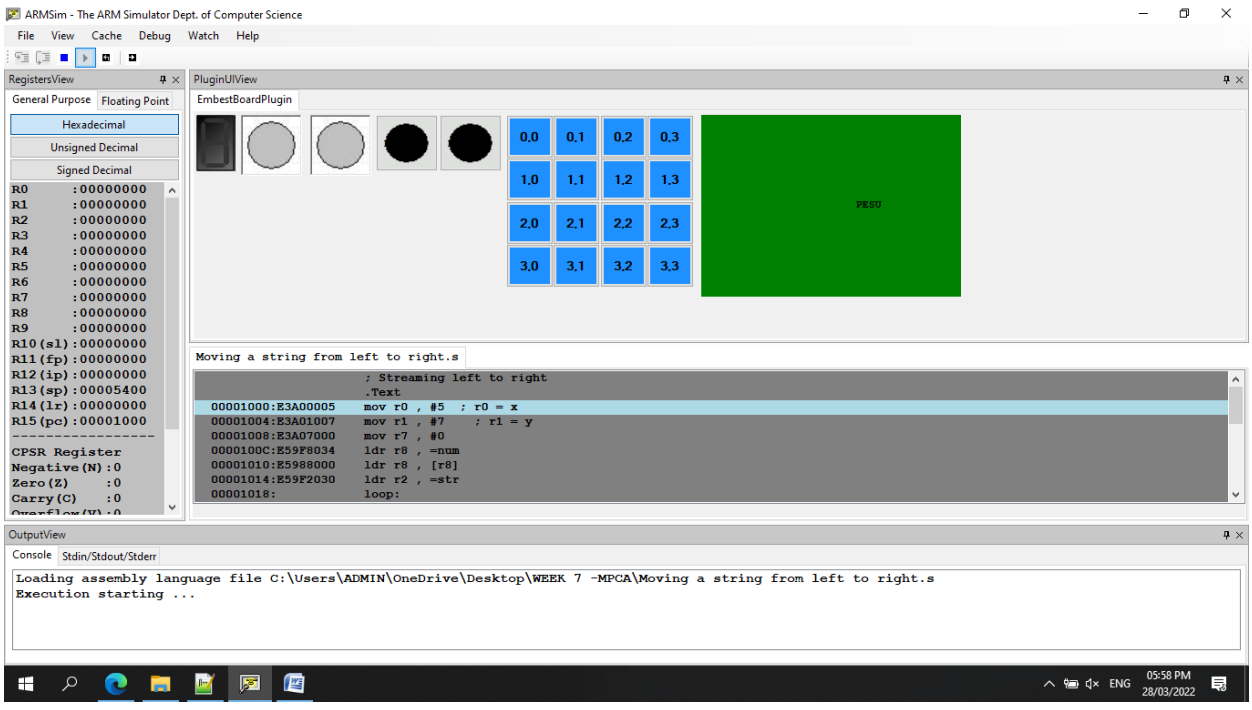
```
                sub r5, r5,#1
                cmp r5, #0
                bne back2
                b again

delay:
                mov r4, #64000
loop3:
                sub r4, r4, #1
                cmp r4, #0
                bge loop3
                mov pc, lr

.data
                zero: .byte  0b11101101
                one:  .byte  0b01100000
                two:  .byte  0b01101110
                three:  .byte  0b11111010
                four:  .byte  0b00110011
                five:  .byte  0b10101011
                six:  .byte  0b10101111
                seven:  .byte  0b01110000
                eight:  .byte  0b11101111
                nine:  .byte  0b11100011
                A:  .byte  0b11100111
                B:  .byte  0b00101111
                C:  .byte  0b10001101
                D:  .byte  0b01101110
                E:  .byte  0b10001111
                F:  .byte  0b10000111
```



c. Move a string from LEFT to RIGHT on the LCD display panel.

```
; Streaming left to right
```

```
.Text
mov r0 , #5  ; r0 = x
mov r1 , #7    ; r1 = y
mov r7 , #0
ldr r8 , =num
ldr r8 , [r8]
ldr r2 , =str
loop:
    swi 0x204   ; display a string on the screen (R2: address)
    bl sum
    cmp r0 , #60
    addne r0 , r0 , #1
    swieq 0x11
    b loop
sum:  cmp r7 , r8
    addne r7 , r7 , #1
    bne sum
    swi 0x206
    mov r7 , #0
    mov pc , lr
.Data
str:  .asciz  "PESU"
num:  .word  15000
```



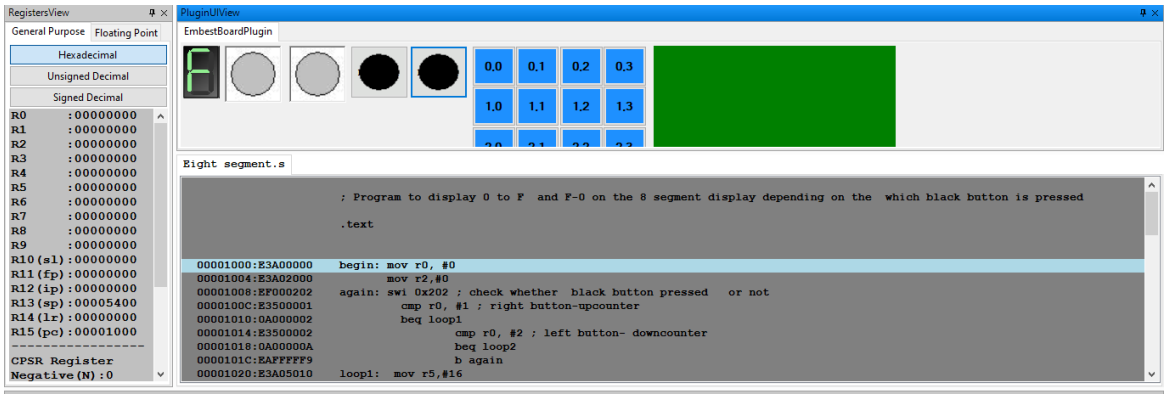
Student Exercises:

1. Execute the following programs on ARMSIM – PLUG-INS.

   a. Display hexadecimal digits [0-9,A-F] on the 8 segment display.

```
.text
begin:
        mov r0, #0
        mov r2,#0
again:
        swi 0x202 ; check whether  black button pressed   or not
        cmp r0, #1 ; right button-upcounter
        beq loop1
        cmp r0, #2 ; left button- downcounter
        beq loop2
        b again
loop1:
        mov r5,#16
    ldr r1,=zero
    back1:ldrb r0, [r1]
        swi 0x200   ; Set 8 segment display to light up
        bl delay
            add r1,r1,#1
            sub r5, r5,#1
            cmp r5, #0
            bne back1
            b again

loop2:
            mov r5,#16
            ldr r1,=F
            back2: ldrb r0, [r1]
            swi 0x200   ; Set 8 segment display to light up
            bl delay
            sub r1, r1, #1
            sub r5, r5,#1
            cmp r5, #0
            bne back2
            b again

delay:
            mov r4, #64000
loop3:
```

```
        sub r4, r4, #1
        cmp r4, #0
        bge loop3
        mov pc, lr

.data
        zero: .byte  0b11101101
        one:  .byte  0b01100000
        two:  .byte  0b01101110
        three:  .byte  0b11111010
        four:  .byte  0b00110011
        five:  .byte  0b10101011
        six:  .byte  0b10101111
        seven:  .byte  0b01110000
        eight:  .byte  0b11101111
        nine:  .byte  0b11100011
        A:  .byte  0b11100111
        B:  .byte  0b00101111
        C:  .byte  0b10001101
        D:  .byte  0b01101110
        E:  .byte  0b10001111
        F:  .byte  0b10000111
```



b. Move a string from RIGHT to LEFT on the LCD display panel.

```
    ; Streaming right to left
    .Text
    mov r0 , #30  ; r0 = x
    mov r1 , #7    ; r1 = y
    mov r7 , #0
    ldr r8 , =num
    ldr r8 , [r8]
    ldr r2 , =str
    loop:
```

```
    swi 0x204   ; display a string on the screen (R2: address)
    bl sum
    cmp r0 , #0
    subne r0 , r0 , #1
    swieq 0x11
    b loop
sum:  cmp r7 , r8
    addne r7 , r7 , #1
    bne sum
    swi 0x206
    mov r7 , #0
    mov pc , lr
.Data
str:  .asciz  "PESU"
num:  .word  15000
```