



Department of Computer Science & Engineering
Microprocessor & Computer Architecture–UE20CS252

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Sl.
No.

Programs

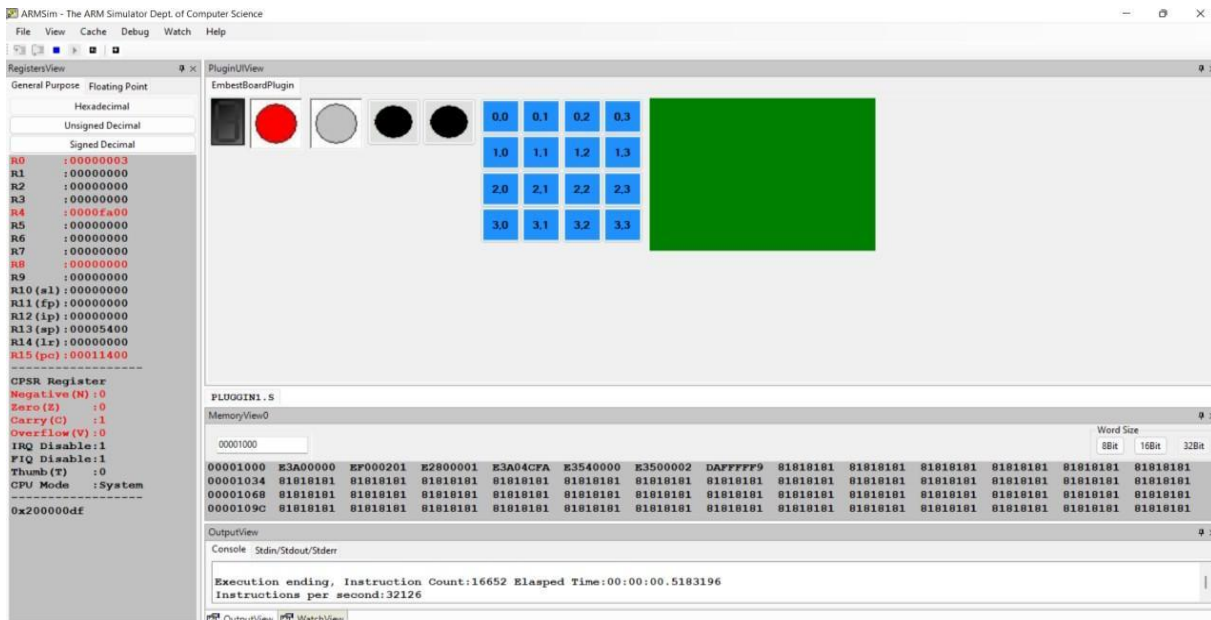
Week
No. 7

1. Demonstration of programs using plug-ins using ARMSIM.

a. Set the LED to be light up.

```
.TEXT
MOV R0,#0
LOOP:SWI 0X201
;TO LIGHT UP LED, R0=1 MEANS RIGHT LED IS ON,
;R0=2 MEANS LEFT IS ON, R0=3 MEANS BOTH LEDS ARE ON

ADD R0,R0,#1
MOV R4,#64000
;DELAY:SUB R4,R4,#1
CMP R4,#0
;BNE DELAY
CMP R0,#3
BLE LOOP
.END
```



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

```

.text
.global _start

begin:      mov r0, #0
            mov r2, #0
again:      swi 0x202 ; check whether          ; black button pressed or not
            cmp r0, #1
            beq loop1
            cmp r0, #2
            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

```

The screenshot displays the ARM simulator's main interface. On the left, the 'RegistersView' shows the state of various registers, including R0 through R15, CPSR, and FIQ. The 'PluginView' on the right features a 4x4 grid of LEDs, with the top-left LED illuminated. Below the LEDs, the 'MemoryView' shows a hex dump of memory starting at address 00001000. The 'OutputView' at the bottom displays the console output, indicating the loading of the assembly file 'D:\Armsim8\LAB\WEEK 7\HEXA-8-SEGMENT-DISPLAY.S' and the start of execution.

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

.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 STRING
```

BL SUM

```
CMP R0,#0
SUBNE R0,R0,#1
SWIEQ 0X011
B LOOP
```

SUM:

```
CMP R7,R8
ADDNE R7,R7,#1
BNE SUM
SWI 0X206 ;CLEAR ONE LINE IN THE DISPLAY ON THE LCD SCREEN
MOV R7,#0
MOV PC,LR
```

.DATA

STR: .ASCIZ "HELLO WORLD"

NUM: .WORD 15000

RegistersView

General Purpose Registers

Run

HEX

Unsigned Decimal

Signed Decimal

R0 :00000000

R1 :00000000

R2 :00000000

R3 :00000000

R4 :00000000

R5 :00000000

R6 :00000000

R7 :00000000

R8 :00000000

R9 :00000000

R10 (s1):00000000

R11 (fp):00000000

R12 (ip):00000000

R13 (sp):00005400

R14 (lr):00000000

R15 (pc):00001000

CPSR Register

Negative (N):0

Zero (Z):0

Carry (C):0

Overflow (V):0

IRQ Disable:1

FIQ Disable:1

Thumb (T):0

CPU Mode :System

0x000000df

PluginUI View

EmbestBoardPlugin

RIGHT-TO-LEFT.S

MemoryView0

00001000

Word Size

8Bit 16Bit 32Bit

00001000 E3A0001E E3A01007 E3A07000 E59F8034 E5988000 E59F2030 EF000204 EB000003 E3500000 12400001 0F000011 EAF00000 E1570008

00001034 12877001 1AFF0000 EF000206 E3A07000 E1A0F00E 0000105C 00001050 4C4C4548 4F57204F 00444C52 00003A98 81818181 81818181

00001068 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181

0000109C 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181

OutputView

Console Stdin/Stdout/Stderr

Loading assembly language file D:\ArmSim\LAB\WEEK 7\RIGHT-TO-LEFT.S

Execution starting ...

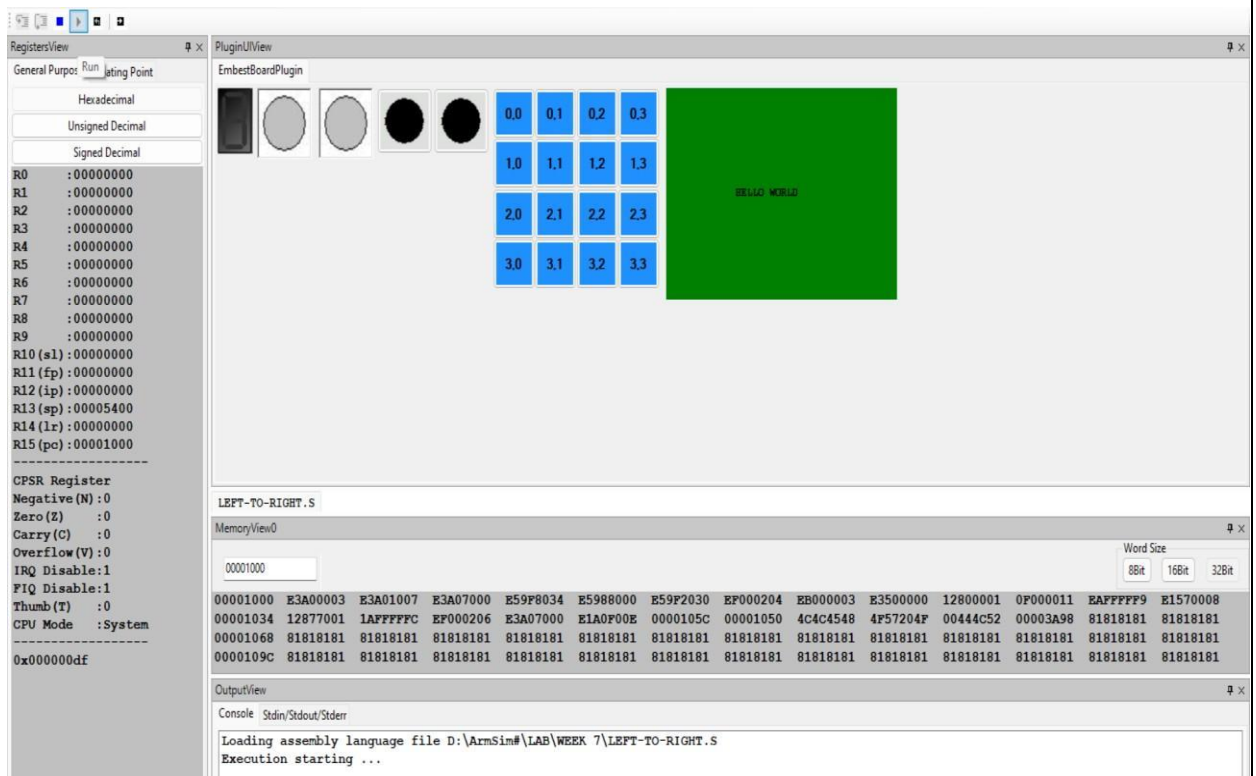
Student Exercises:

2. Execute the following programs on ARMSIM – plug–ins.
 - a. Move a string from LEFT to RIGHT on the LCD display panel.

```
.TEXT
MOV R0,#3 ; RO= 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 STRING

BL SUM
CMP R0,#0
ADDNE R0,R0,#1
SWIEQ 0X011
B LOOP
SUM:
CMP R7,R8
ADDNE R7,R7,#1
BNE SUM
SWI 0X206 ;CLEAR ONE LINE IN THE DISPLAY ON THE LCD SCREEN
MOV R7,#0
MOV PC,LR

.DATA
STR: .ASCIZ "HELLO WORLD"
NUM: .WORD 15000
```



MPCA–Laboratory/Assignment/Hands–on/Project