Microprocessors and Computer Architecture

Lab – Week 7

PES1UG20CS224

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

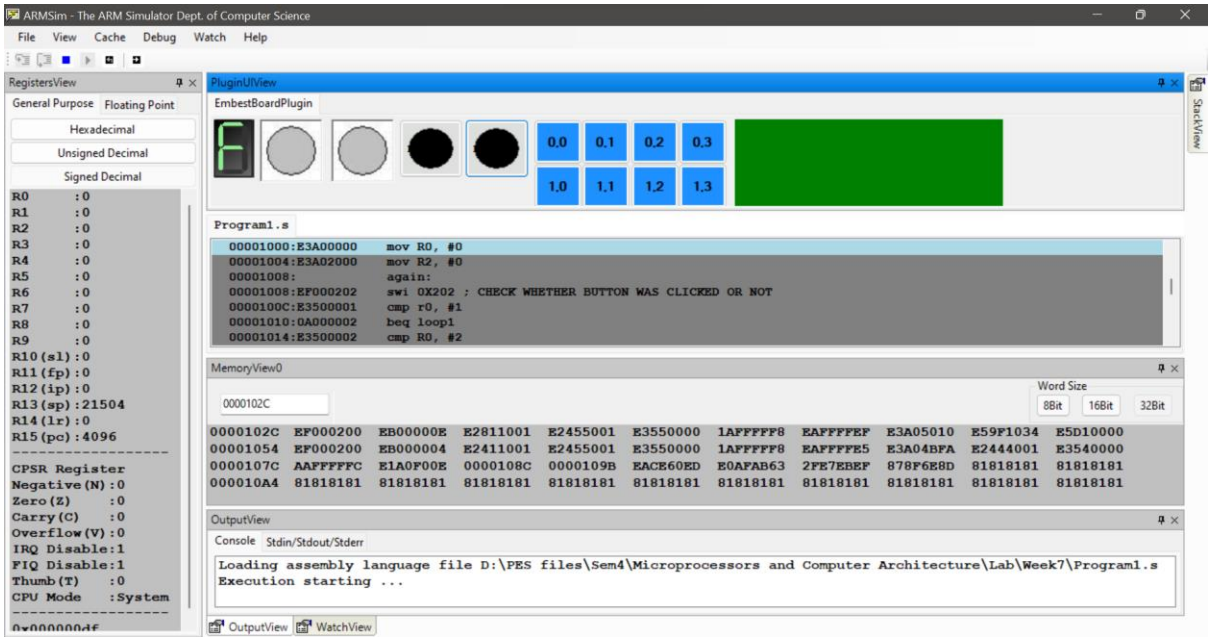
   Code :

```
.DATA
ZERO: .BYTE 0B11101101
ONE: .BYTE 0B01100000
TWO: .BYTE 0B11001110
THREE: .BYTE 0B11101010
FOUR: .BYTE 0B01100011
FIVE: .BYTE 0B10101011
SIX: .BYTE 0B10101111
SEVEN: .BYTE 0B11100000
EIGHT: .BYTE 0B11101111
NINE: .BYTE 0B11101011
A: .byte 0b11100111
B: .byte 0b00101111
C: .byte 0b10001101
D: .byte 0b01101110
E: .byte 0b10001111
F: .byte 0b10000111

.TEXT
; PROGRAM TO DISPLAY 0 TO F AND F TO 0
begin:
mov R0, #0
mov R2, #0
again:
swi 0X202 ; CHECK WHETHER BUTTON WAS CLICKED 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, #256000
loop3:
sub r4, r4, #1
cmp r4, #0
bge loop3
mov pc, lr
```

Output :



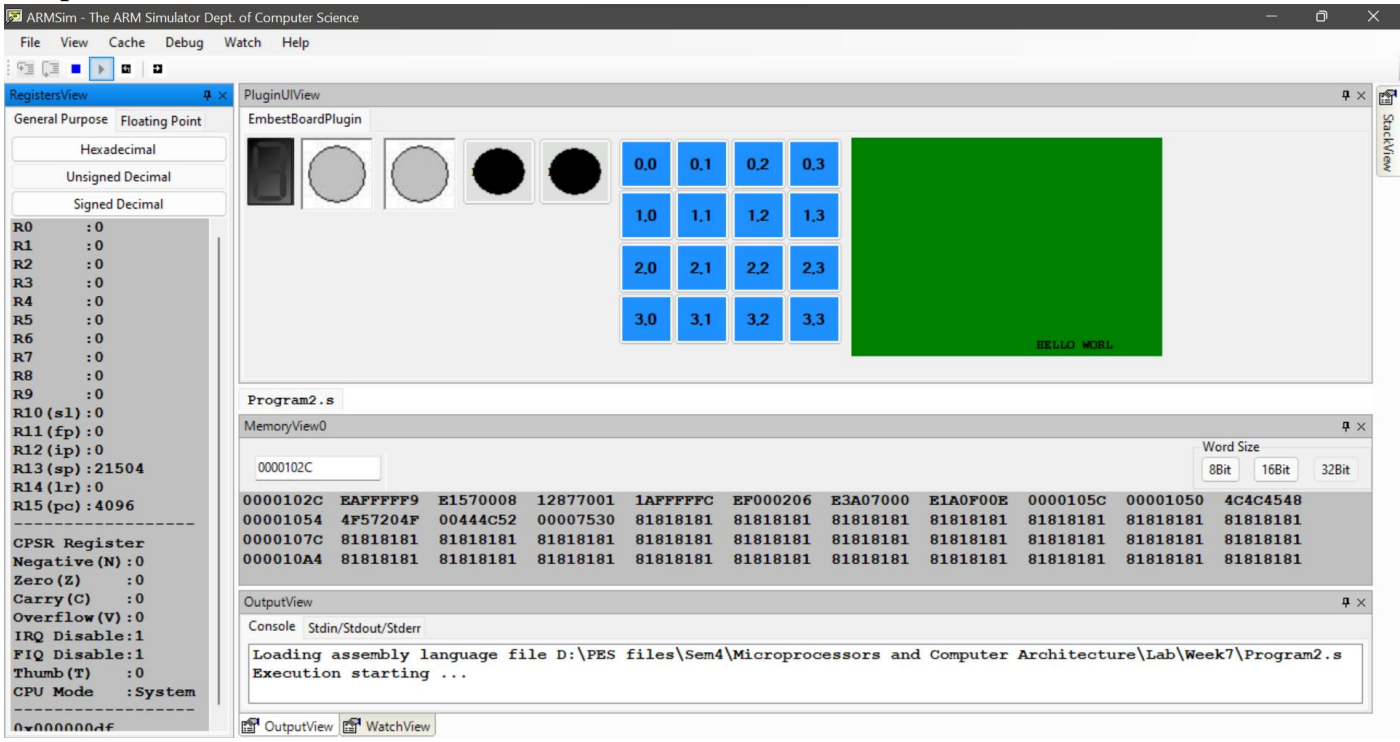
2. Move a string from LEFT to RIGHT on the LCD display panel.

Code :

```
.TEXT
        MOV R0,#0 ; R0=X
        MOV R1,#14 ;R1=Y
        MOV R7,#0
        LDR R8,=NUM
        LDR R8,[R8]
        LDR R2,=STR
 LOOP:      SWI 0X204 ; DISPLAY STRING ON SCREEN(R2)
        BL SUM
        CMP R0,#70
        ADDNE R0,R0,#1
        SWIEQ 0X011
        B LOOP
 SUM:       CMP R7,R8
        ADDNE R7,R7,#1
        BNE SUM
        SWI 0X206 ; CLEAR THE SCREEN
        MOV R7,#0
        MOV PC,LR

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

Output :


ARMSim - The ARM Simulator Dept. of Computer Science
File View Cache Debug Watch Help
RegistersView
General Purpose Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :0
R1 :0
R2 :0
R3 :0
R4 :0
R5 :0
R6 :0
R7 :0
R8 :0
R9 :0
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):21504
R14(lr):0
R15(pc):4096
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
PluginUIView
EmbestBoardPlugin
0,0 0,1 0,2 0,3
1,0 1,1 1,2 1,3
2,0 2,1 2,2 2,3
3,0 3,1 3,2 3,3
HELLO WORL
Program2.s
MemoryView0
0000102C
Word Size
8Bit 16Bit 32Bit
0000102C EAFFFFF9 E1570008 12877001 1AFFFFFC EF000206 E3A07000 E1A0F00E 0000105C 00001050 4C4C4548
00001054 4F57204F 00444C52 00007530 81818181 81818181 81818181 81818181 81818181 81818181 81818181
0000107C 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010A4 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
OutputView
Console Stdin/Stdout/Stderr
Loading assembly language file D:\PES files\Sem4\Microprocessors and Computer Architecture\Lab\Week7\Program2.s
Execution starting ...
OutputView WatchView
StackView