

Assignment 6

CS18M524 – Ananya Barat

1. Solved in file arm_lab_cs18m524_6_a.s

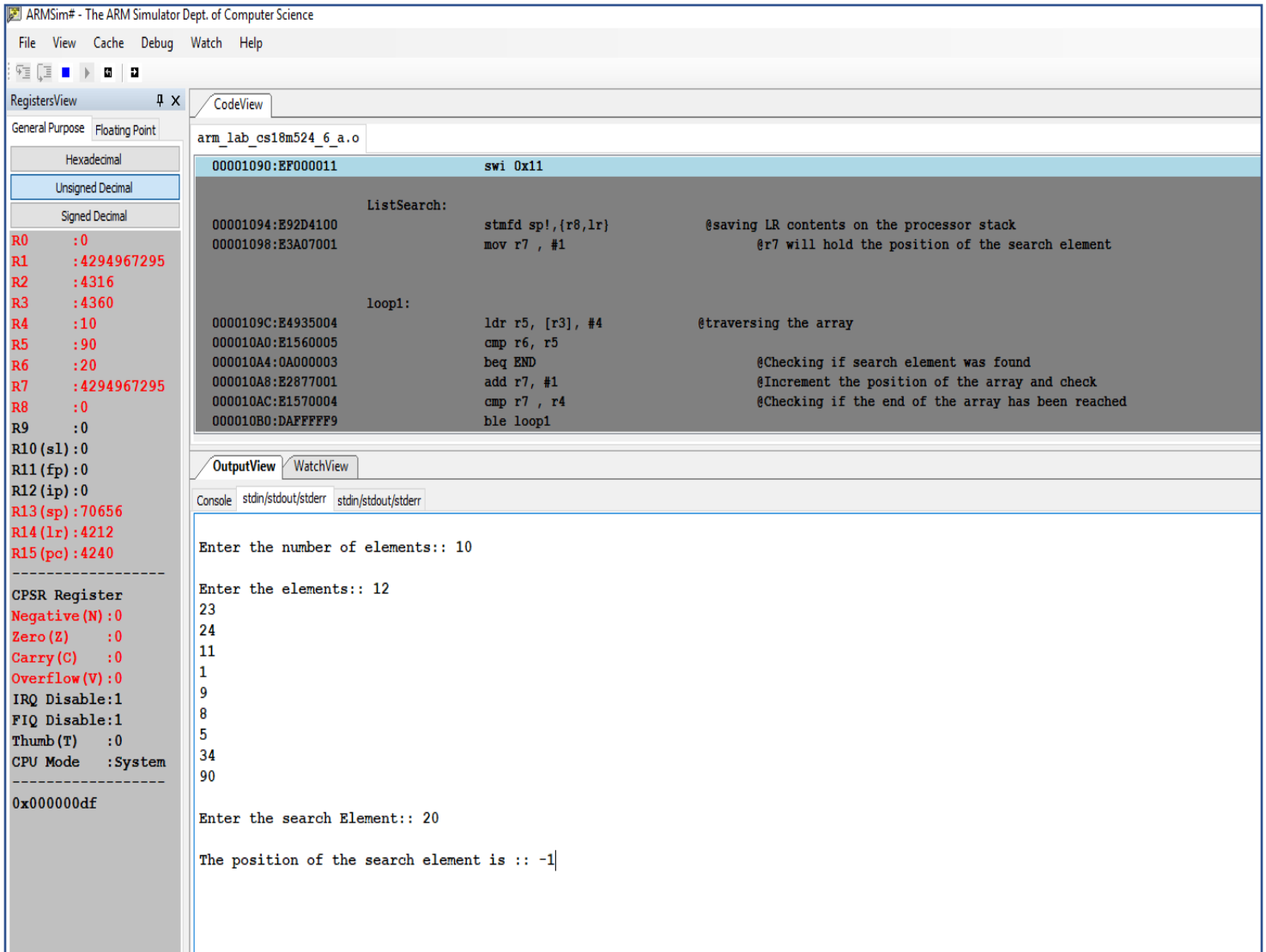
i> **Test Case 1:** When the element is present in the array and the elements are in unsorted order.

Expected Result: The first occurrence is shown as position.

The screenshot displays an ARM assembly simulator interface. On the left, the 'RegistersView' panel shows the state of registers R0 through R15 and the CPSR register. R0 is 0, R1 is 7, R2 is 4316, R3 is 4348, R4 is 7, R5 is 15, R6 is 15, R7 is 7, R8 is 0, R9 is 0, R10 (s1) is 0, R11 (fp) is 0, R12 (ip) is 0, R13 (sp) is 70656, R14 (lr) is 4212, and R15 (pc) is 4240. The CPSR register shows Negative (N) as 0, Zero (Z) as 1, Carry (C) as 0, Overflow (V) as 0, IRQ Disable as 1, FIQ Disable as 1, Thumb (T) as 0, and CPU Mode as System. The main window shows the 'CodeView' of the assembly file 'arm_lab_cs18m524_6_a.o'. The assembly code includes a 'swi 0x11' instruction, a 'ListSearch' section with 'stmfd sp!, {r8,lr}' and 'mov r7, #1', and a 'loop1' section with 'ldr r5, [r3], #4', 'cmp r6, r5', 'beq END', 'add r7, #1', 'cmp r7, r4', and 'ble loop1'. The 'OutputView' panel shows the user input: 'Enter the number of elements:: 7', 'Enter the elements:: 23', '31', '12', '5', '17', '9', '15', 'Enter the search Element:: 15', and the program output: 'The position of the search element is :: 7|'.

ii> **Test Case 2:** When element is not present in the array

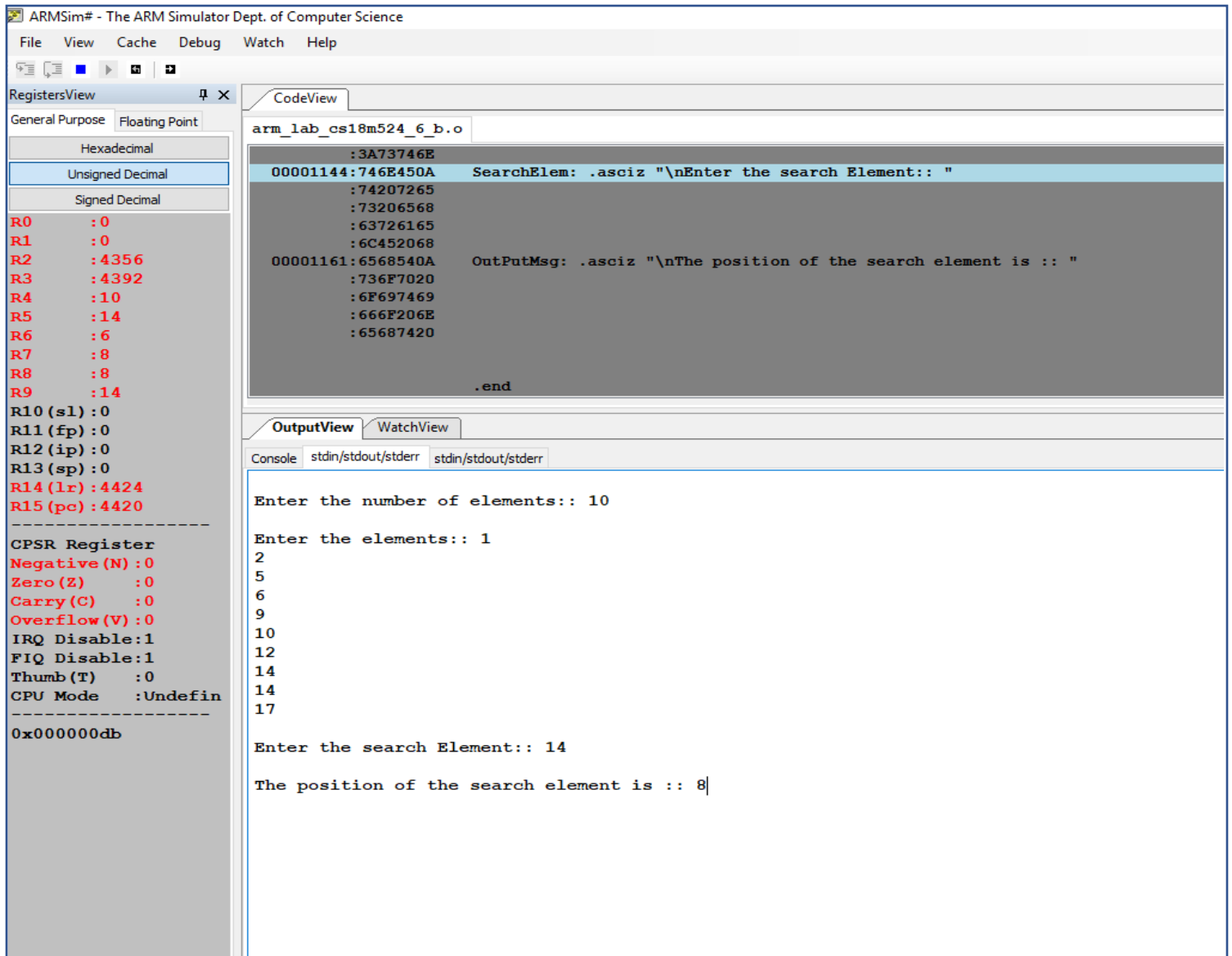
Expected Result : Output is -1.



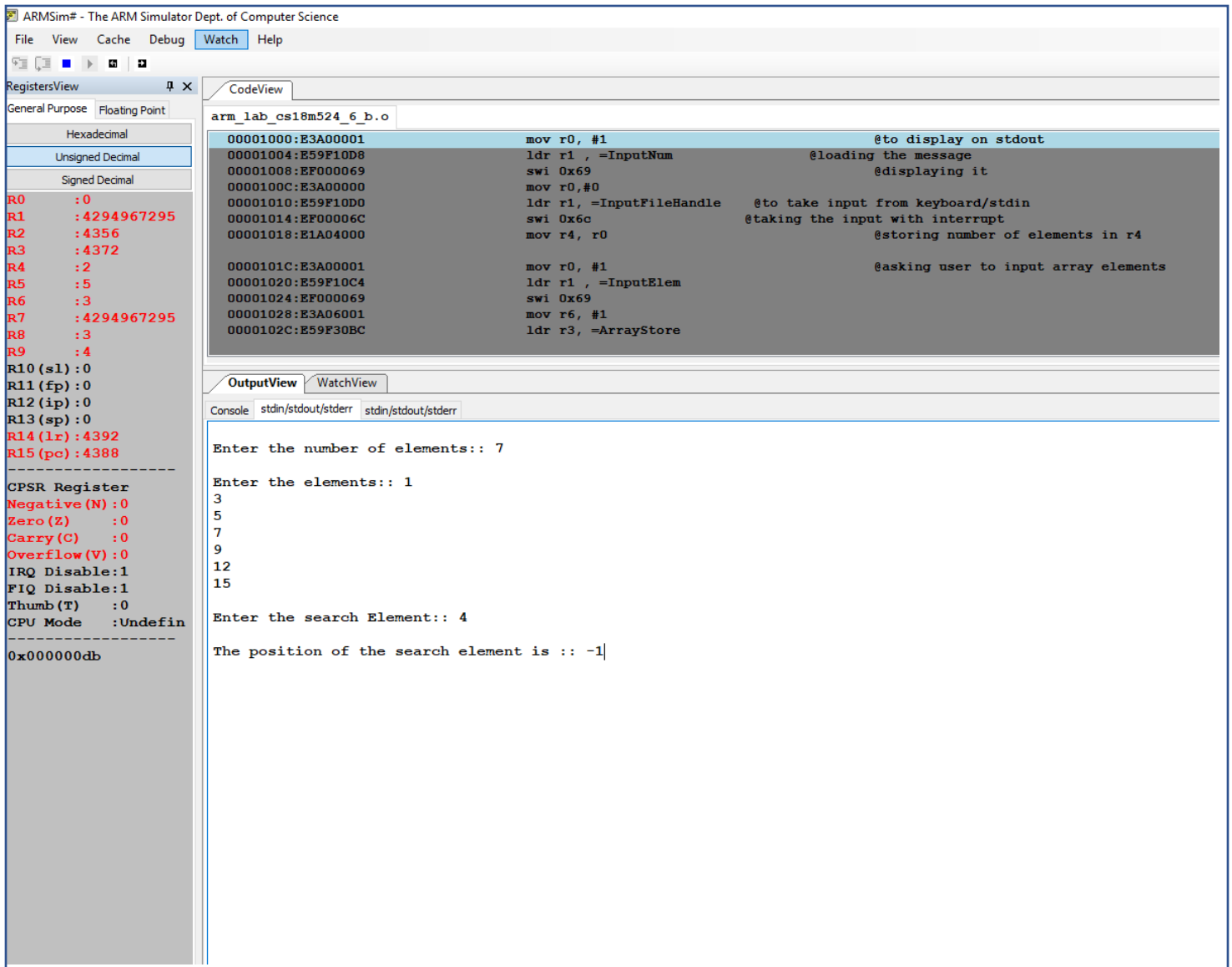
2. Solved in file arm_lab_cs18m524_6_b.s

i> **Test Case 1:** When the element is present in the array and there are duplicate inputs.

Expected Result: The first occurrence is shown as position.



ii> **Test Case 2:** When element is not present in the array
Expected Result : Output is -1.



3. Solved in file `arm_lab_cs18m524_6_c.s`

Test case: Showing the output for 3 different values of N.

FileViewCacheDebugWatchHelp

RegistersView

CodeView

General PurposeFloating Point

Hexadecimal

Unsigned Decimal

Signed Decimal

R0:0

R1:89

R2:4268

R3:11

R4:34

R5:55

R6:11

R7:89

R8:0

R9:0

R10(s1):0

R11(fp):0

R12(ip):0

R13(sp):70584

R14(lr):4192

R15(pc):4232

CPSR Register

Negative(N):0

Zero(Z):1

Carry(C):0

Overflow(V):0

IRQ Disable:1

FIQ Disable:1

Thumb(T):0

CPU Mode:System

0x400000df

arm_lab_cs18m524_6_c.o

00001000:E3A00001mov r0, #1@to display on stdout

00001004:E59F1074ldr r1, =InputNum@loading the message

00001008:EF000069swi 0x69@displaying it

0000100C:E3A00000mov r0, #0

00001010:E59F106Cldr r1, =InputFileHandle

00001014:EF00006Cswi 0x6c@ask the user to input the value N

00001018:E1A03000mov r3, r0

0000101C:E3A04001mov r4, #1@first value of series = 1

00001020:E3A05001mov r5, #1@Second value of series = 1

00001024:E3A07001mov r7, #1

00001028:E3530001cmp r3, #1

0000102C:0A00000Cbeq Output@if N =1 or N=2 Output =1

00001030:E3530002cmp r3, #2

OutputView

WatchView

Console

stdin/stdout/stderr

stdin/stdout/stderr

Enter the value N ::: 11

The value is :: 89

RegistersView

CodeView

General Purpose Floating Point

Hexadecimal

Unsigned Decimal

Signed Decimal

R0 :0
R1 :1
R2 :4268
R3 :2
R4 :1
R5 :1
R6 :0
R7 :1
R8 :0
R9 :0
R10 (s1):0
R11 (fp):0
R12 (ip):0
R13 (sp):70656
R14 (lr):0
R15 (pc):4232

CPSR Register

Negative (N):0

Zero (Z):1

Carry (C):0

Overflow (V):0

IRQ Disable:1

FIQ Disable:1

Thumb (T):0

CPU Mode :System

0x400000df

arm_lab_cs18m524_6_c.o

```
00001000:E3A00001    mov r0, #1                @to display on stdout
00001004:E59F1074    ldr r1, =InputNum         @loading the message
00001008:EF000069    swi 0x69                  @displaying it
0000100C:E3A00000    mov r0, #0
00001010:E59F106C    ldr r1, =InputFileHandle
00001014:EF00006C    swi 0x6C                  @ask the user to input the value N
00001018:E1A03000    mov r3, r0

0000101C:E3A04001    mov r4, #1                @first value of series = 1
00001020:E3A05001    mov r5, #1                @Second value of series = 1
00001024:E3A07001    mov r7, #1
00001028:E3530001    cmp r3, #1
0000102C:0A00000C    beq Output                @if N =1 or N=2 Output =1
00001030:E3530002    cmp r3, #2
```

OutputView

WatchView

Console stdin/stdout/stderr stdin/stdout/stderr

Enter the value N :: 2

The value is :: 1

ARMSim# - The ARM Simulator Dept. of Computer Science

FileViewCacheDebugWatchHelp

RegistersView

CodeView

General PurposeFloating Point

HexadecimalUnsigned DecimalSigned Decimal

R0:0

R1:8

R2:4268

R3:6

R4:3

R5:5

R6:6

R7:8

R8:0

R9:0

R10(s1):0

R11(fp):0

R12(ip):0

R13(sp):70624

R14(lr):4192

R15(pc):4232

CPSR Register

Negative(N):0

Zero(Z):1

Carry(C):0

Overflow(V):0

IRQ Disable:1

FIQ Disable:1

Thumb(T):0

CPU Mode:System

0x40000df

arm_lab_cs18m524_6_c.o

00001000:E3A00001mov r0, #1@to display on stdout

00001004:E59F1074ldr r1, =InputNum@loading the message

00001008:EF000069swi 0x69@displaying it

0000100C:E3A00000mov r0, #0

00001010:E59F106Cldr r1, =InputFileHandle

00001014:EF00006Cswi 0x6c@ask the user to input the value N

00001018:E1A03000mov r3, r0

0000101C:E3A04001mov r4, #1@first value of series = 1

00001020:E3A05001mov r5, #1@Second value of series = 1

00001024:E3A07001mov r7, #1

00001028:E3530001cmp r3, #1

0000102C:0A00000Cbeq Output@if N =1 or N=2 Output =1

00001030:E3530002cmp r3, #2

OutputViewWatchView

Consolestdin/stdout/stderrstdin/stdout/stderr

Enter the value N ::: 6

The value is :: 8|