

Microprocessor and Computer Architecture
UE21CS251B

4th Semester, Academic Year 2022-23

Date:

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Assignment 1

Program 1

Write a program in ARM7TDMI-ISA to search for an element in an array. Display appropriate messages on the standard output device. For Successful search display as “Successful Search” and if the search is unsuccessful, display as “Unsuccessful Search”. Use Binary search Technique.

- I. ARM Assembly Code
- II. Output Screen Shots (Two)

The output should be verified for search Successful and Search Unsuccessful

ARM Assembly Code:

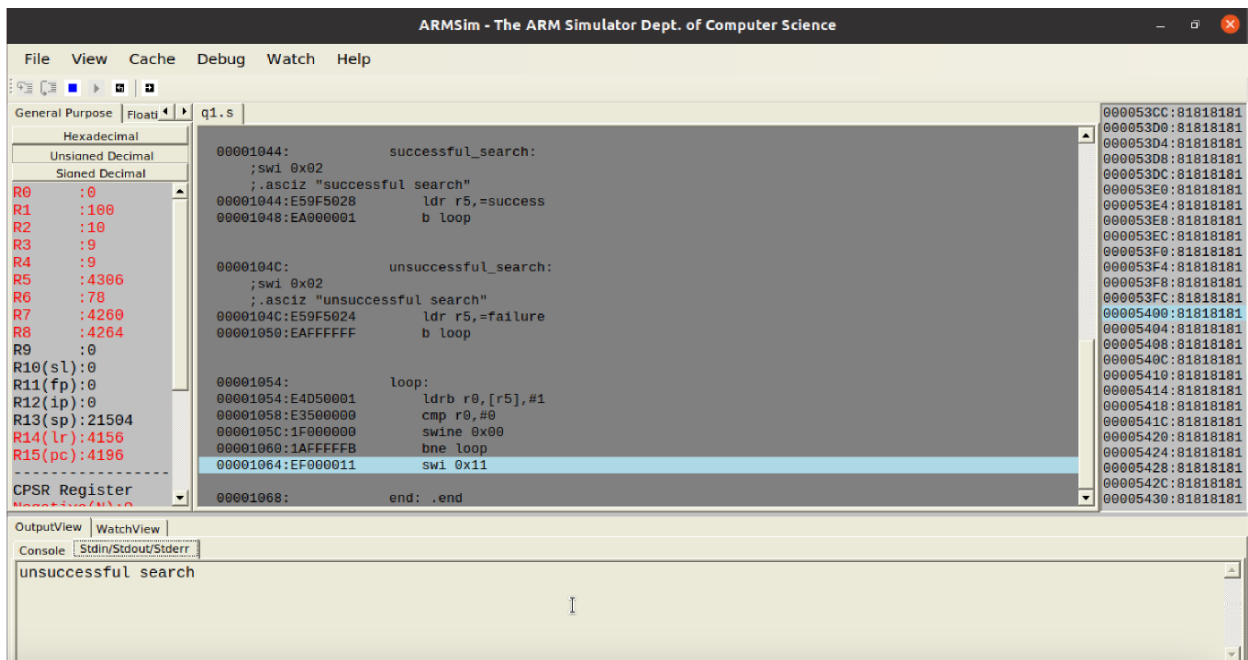
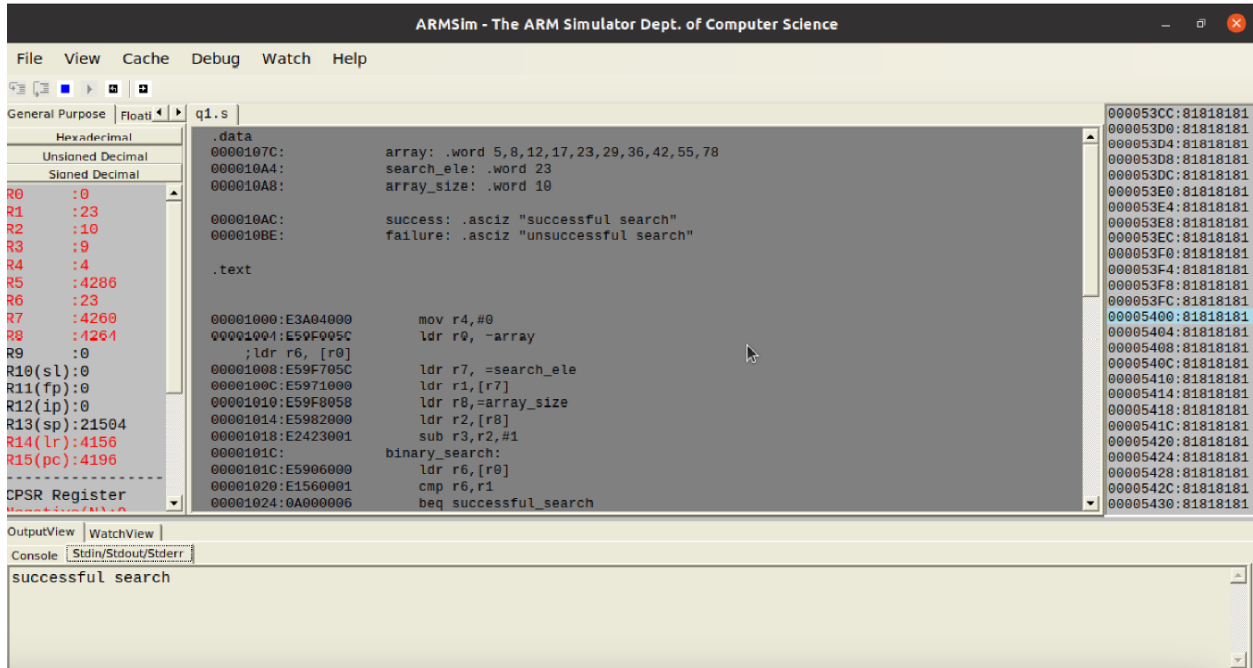
```
.data
array: .word 5,8,12,17,23,29,36,42,55,78
search_ele: .word 23
array_size: .word 10
success: .asciz "successful search"
failure: .asciz "unsuccessful search"
.text
```

```

mov r4,#0
ldr r0, =array
;ldr r6, [r0]
ldr r7, =search_ele
ldr r1,[r7]
ldr r8,=array_size
ldr r2,[r8]
sub r3,r2,#1
binary_search:
ldr r6,[r0]
cmp r6,r1
beq successful_search
add r0,r0,#4
cmp r3,r4
beq unsuccessful_search
add r4,r4,#1
bl binary_search
bx lr
swi 0x11
successful_search:
;swi 0x02
;.asciz "successful search"
ldr r5,=success
b loop
unsuccessful_search:
;swi 0x02
;.asciz "unsuccessful search"
ldr r5,=failure
b loop
loop:
ldrb r0,[r5],#1
cmp r0,#0
swine 0x00
bne loop
swi 0x11
end: .end

```

Output Screenshots



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Assignment 1 Program 2

Write a program in ARM7TDMI-ISA to find a sub string in a given main string.

Example1: Main string : My name is Bond.

Character : 'name'.

Expected Output : "String Present"

Example2: Main string : My name is Bond.

Character : 'James'.

Expected Output : "String Absent"

I. Output Screen Shots (Two)

The output should be verified for Substring Present and Substring Absent

.ARM Assembly Code

```
.data
STRING: .ASCIZ "My name is Bond"
SUBSTR: .ASCIZ "name"
OUTPUT1: .ASCIZ "String Present"
OUTPUT2: .ASCIZ "String Absent"
```

```

.text

LDR r0,=STRING
LDR r1,=SUBSTR

initmatch:
    LDRB r2,[r0],#1
    LDRB r3,[r1]
    CMP r2,#0
    BEQ notfound
    CMP r2,r3
    MOV r4,r0
    ADD r5,r1,#1
    BEQ submatch
    B initmatch

submatch:
    LDRB r2,[r4],#1
    LDRB r3,[r5],#1
    CMP r3,#0
    BEQ found
    CMP r2,r3
    BEQ submatch
    B initmatch

found:
    LDR r1,=OUTPUT1
    B LOOP

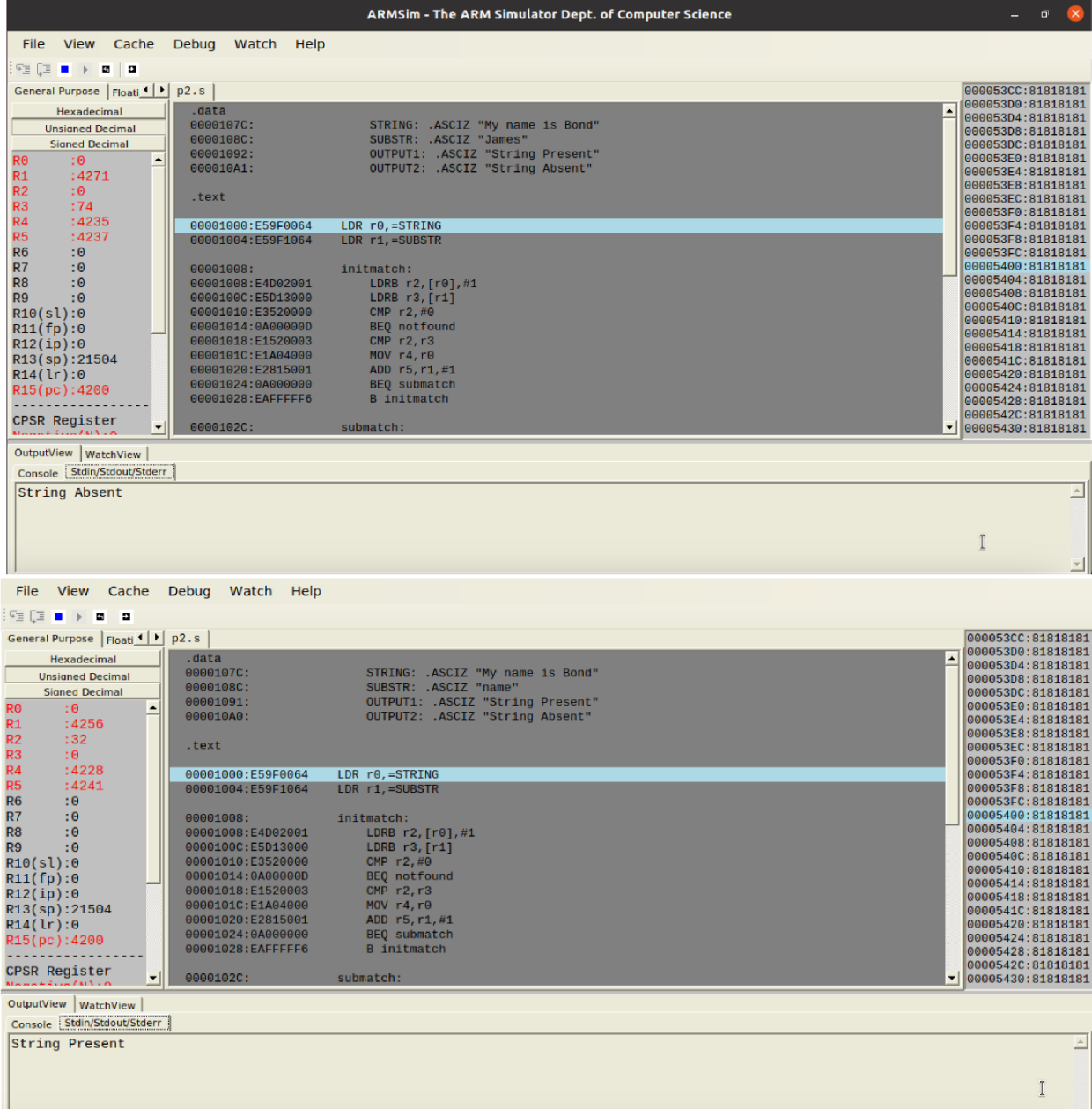
notfound:
    LDR r1,=OUTPUT2
    B LOOP

LOOP:
    LDRB R0,[R1],#1
    CMP R0,#0
    SWINE 0x00
    BNE LOOP

SWI 0x11

```

Output Screen Shots



Disclaimer:

- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

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