Microprocessor and Computer Architecture Laboratory

UE19CS256

4th Semester, Academic Year 2020-21

Date:

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section F

Week#____6_____ Program Number: ____1__

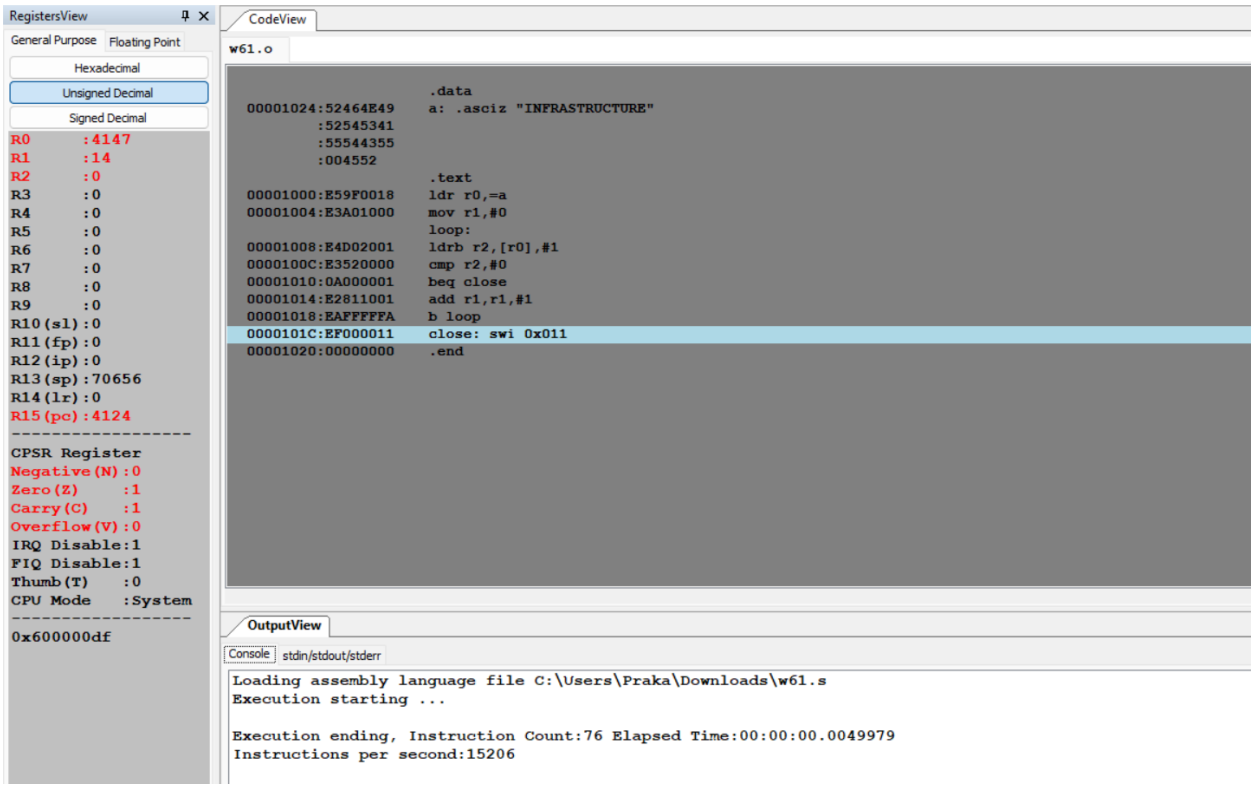
Write an ALP to find the length of a given string

I. ARM Assembly Code (1).

```
.data
a: .asciz "INFRASTRUCTURE"
.text
ldr r0,=a
mov r1,#0
loop:
ldrb r2,[r0],#1
cmp r2,#0
beq close
add r1,r1,#1
b loop
```

```
close: swi 0x011
.end
```

II. Output Screen Shot (One Example of your choice)



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Name: NAGAVENI L G	SRN:PES2UG21CS315	Section F

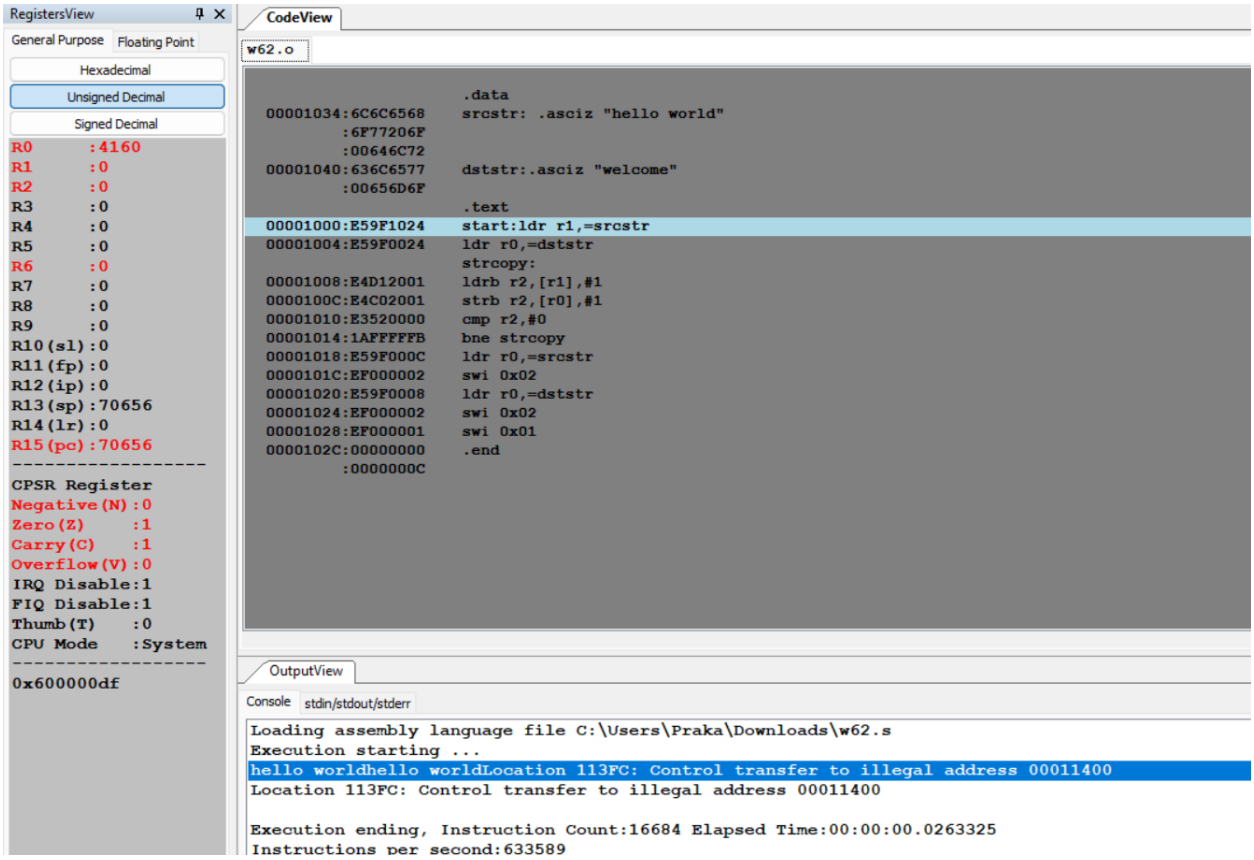
Week#____6_____ Program Number: ____2__

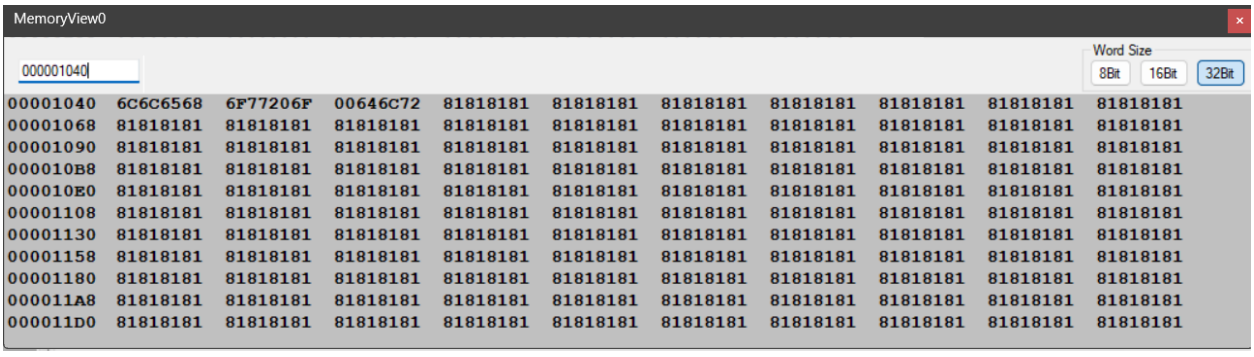
Write an ALP to copy string from one location to another

I. ARM Assembly Code (1).

```
.data
srcstr: .asciz "hello world"
dststr:.asciz "welcome"
.text
start:ldr r1,=srcstr
ldr r0,=dststr
strcopy:
ldrb r2,[r1],#1
strb r2,[r0],#1
cmp r2,#0
bne strcopy
ldr r0,=srcstr
swi 0x02
ldr r0,=dststr
swi 0x02
swi 0x01
.end
```

II. Output Screen Shot (One Example of your choice)





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Date:

Name: NAGAVENI L G	SRN:PES2UG21CS315	Section F

Week#____6_____ Program Number: ____3__

Write an ALP to find whether a given character is present in a string.

I. ARM Assembly Code (1).
II. Output Screen Shot -2 (One Example of your choice)

IF THE CHAR IS PRESENT

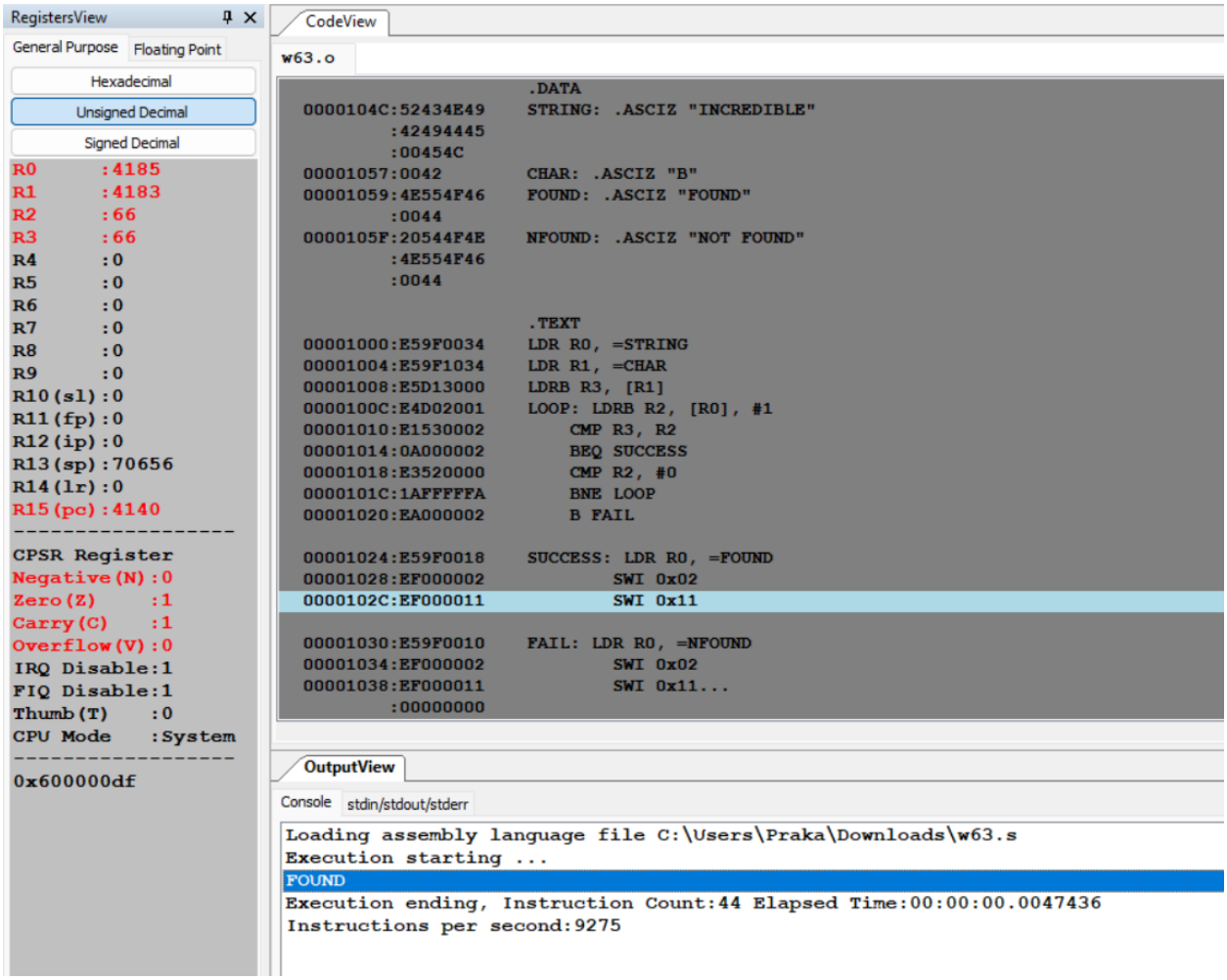
```
.DATA
STRING: .ASCIZ "INCREDIBLE"
CHAR: .ASCIZ "B"
FOUND: .ASCIZ "FOUND"
NFOUND: .ASCIZ "NOT FOUND"

.TEXT
LDR R0, =STRING
```

```
LDR R1, =CHAR
LDRB R3, [R1]
LOOP: LDRB R2, [R0], #1
    CMP R3, R2
    BEQ SUCCESS
    CMP R2, #0
    BNE LOOP
    B FAIL

SUCCESS: LDR R0, =FOUND
        SWI 0x02
        SWI 0x11

FAIL: LDR R0, =NFOUND
        SWI 0x02
        SWI 0x11
```



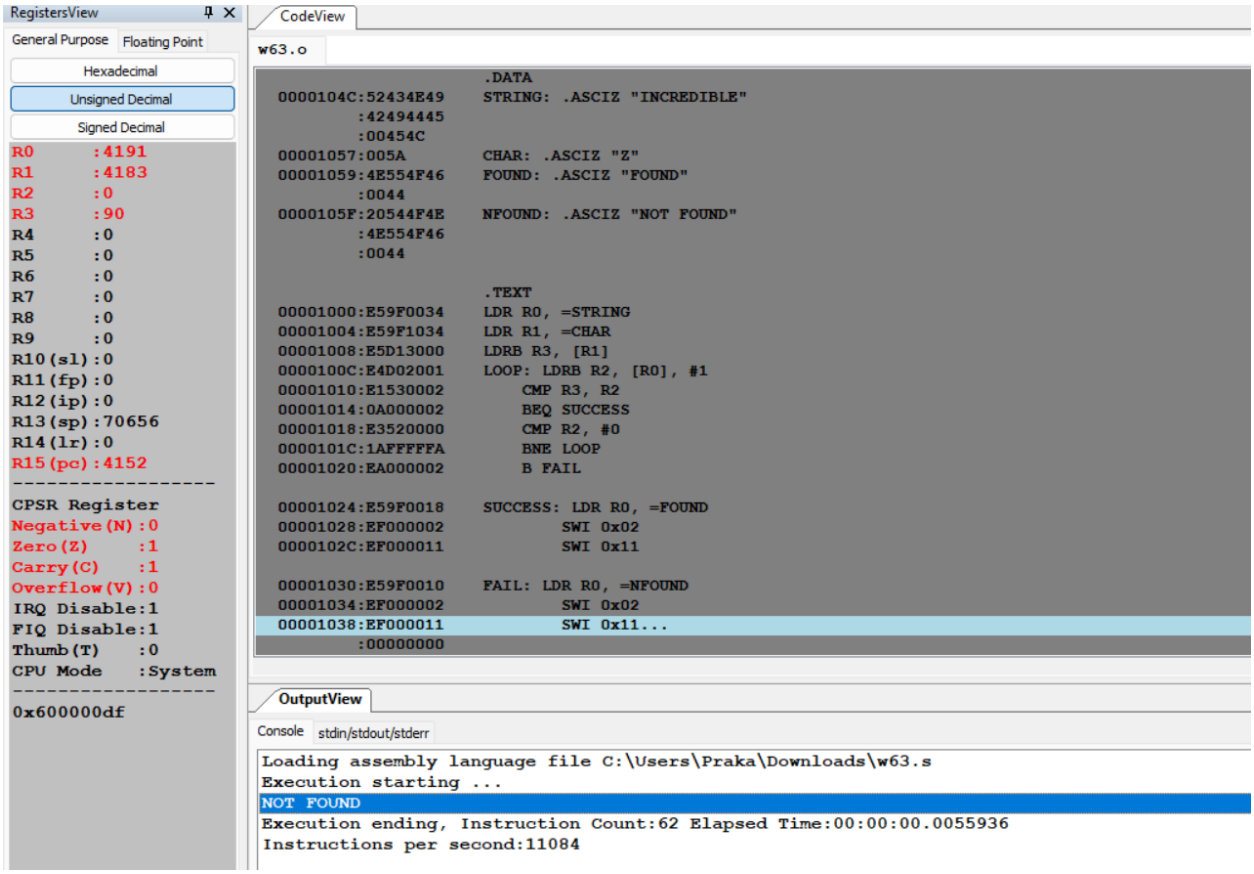
IF THE CHAR IS NOT PRESENT

```
.DATA
STRING: .ASCIZ "INCREDIBLE"
CHAR: .ASCIZ "Z"
FOUND: .ASCIZ "FOUND"
NFOUND: .ASCIZ "NOT FOUND"

.TEXT
LDR R0, =STRING
LDR R1, =CHAR
LDRB R3, [R1]
LOOP: LDRB R2, [R0], #1
    CMP R3, R2
    BEQ SUCCESS
    CMP R2, #0
    BNE LOOP
    B FAIL

SUCCESS: LDR R0, =FOUND
        SWI 0x02
        SWI 0x11

FAIL: LDR R0, =NFOUND
        SWI 0x02
        SWI 0x11
```


RegistersView
General Purpose
Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :4191
R1 :4183
R2 :0
R3 :90
R4 :0
R5 :0
R6 :0
R7 :0
R8 :0
R9 :0
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):70656
R14(lr):0
R15(pc):4152
CPSR Register
Negative(N):0
Zero(Z) :1
Carry(C) :1
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T) :0
CPU Mode :System
0x600000df
CodeView
w63.o
.DATA
0000104C:52434E49 STRING: .ASCIZ "INCREDIBLE"
:42494445
:00454C
00001057:005A CHAR: .ASCIZ "Z"
00001059:4E554F46 FOUND: .ASCIZ "FOUND"
:0044
0000105F:20544F4E NFOUND: .ASCIZ "NOT FOUND"
:4E554F46
:0044
.TEXT
00001000:E59F0034 LDR R0, =STRING
00001004:E59F1034 LDR R1, =CHAR
00001008:E5D13000 LDRB R3, [R1]
0000100C:E4D02001 LOOP: LDRB R2, [R0], #1
00001010:E1530002 CMP R3, R2
00001014:0A000002 BEQ SUCCESS
00001018:E3520000 CMP R2, #0
0000101C:1AFFFFFA BNE LOOP
00001020:EA000002 B FAIL
00001024:E59F0018 SUCCESS: LDR R0, =FOUND
00001028:EF000002 SWI 0x02
0000102C:EF000011 SWI 0x11
00001030:E59F0010 FAIL: LDR R0, =NFOUND
00001034:EF000002 SWI 0x02
00001038:EF000011 SWI 0x11...
:00000000
OutputView
Console
stdin/stdout/stderr
Loading assembly language file C:\Users\Praka\Downloads\w63.s
Execution starting ...
NOT FOUND
Execution ending, Instruction Count:62 Elapsed Time:00:00:00.0055936
Instructions per second:11084

Microprocessor and Computer Architecture Laboratory

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4th Semester, Academic Year 2020-21

Date:

Name: NAGAVENI L G	SRN:PES2UG21CS315	Section F

Week#____6_____ Program Number: ____4_

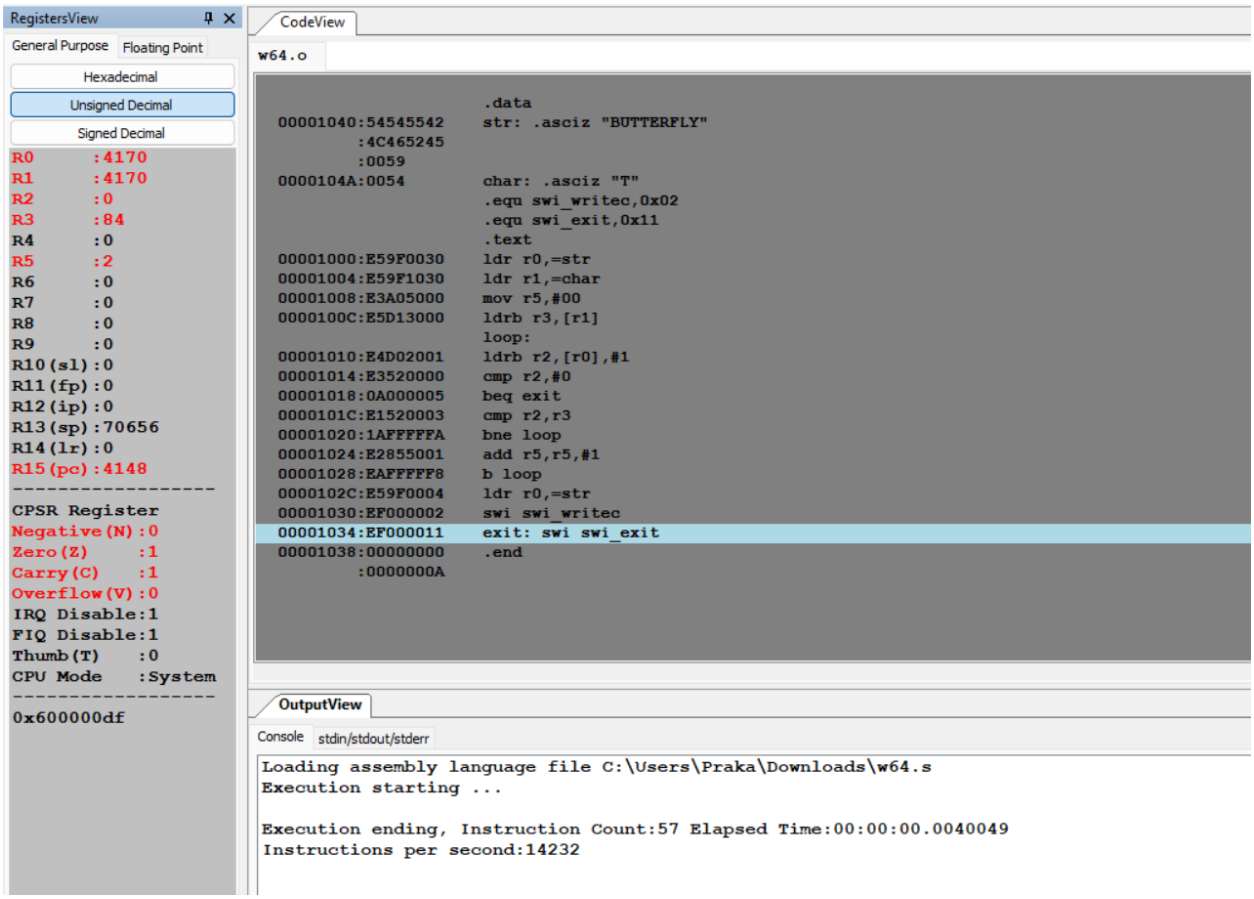
Write an ALP to find how many times a given character is present in a string

I. ARM Assembly Code (1).
II. Output Screen Shot (One Example of your choice)

If the char is present

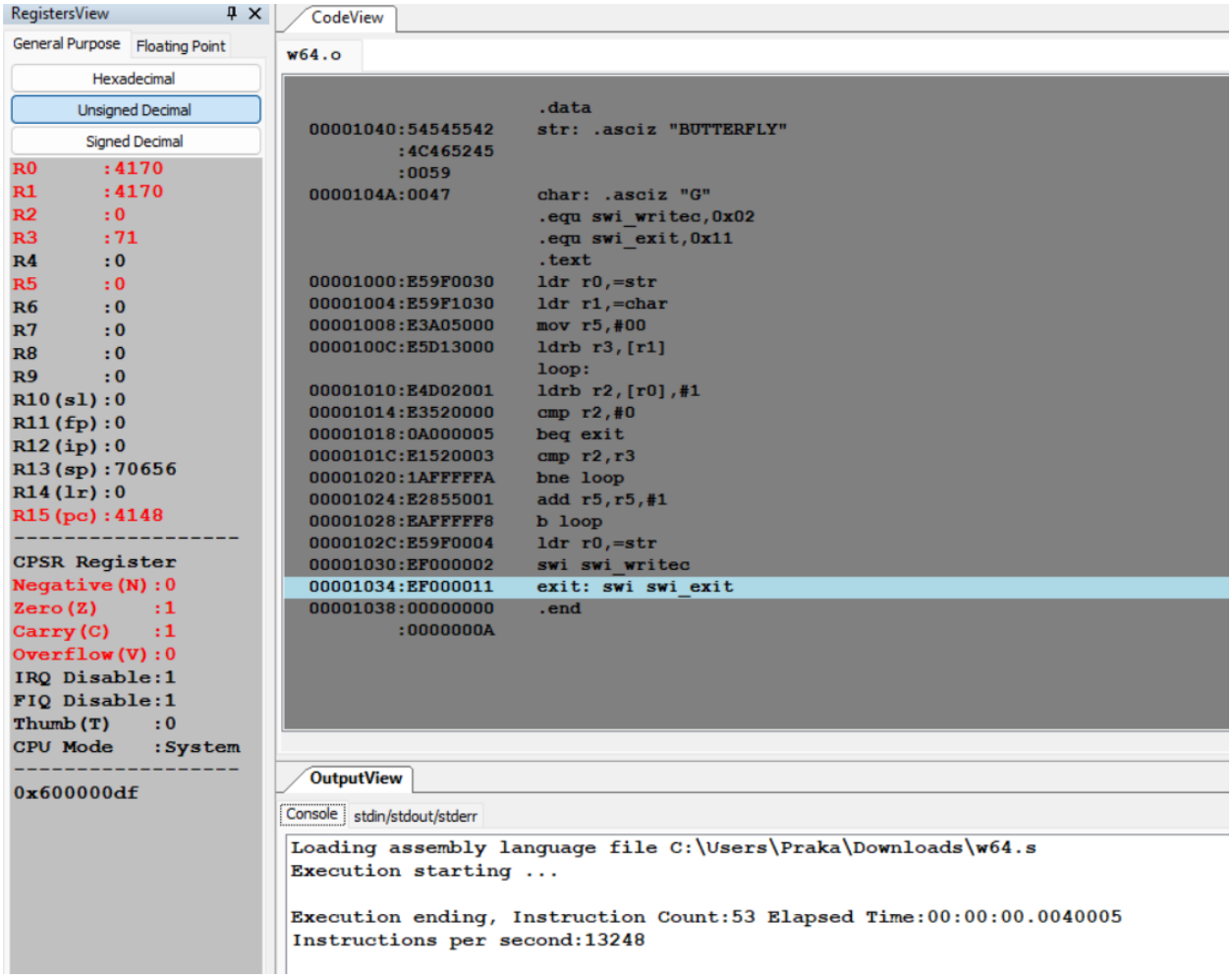
```
.data
str: .asciz "BUTTERFLY"
char: .asciz "T"
.equ swi_writec,0x02
.equ swi_exit,0x11
.text
ldr r0,=str
ldr r1,=char
mov r5,#00
ldrb r3,[r1]
loop:
ldrb r2,[r0],#1
```

```
cmp r2,#0
beq exit
cmp r2,r3
bne loop
add r5,r5,#1
b loop
ldr r0,=str
swi swi_writec
exit: swi swi_exit
.end
```



If the char is not present

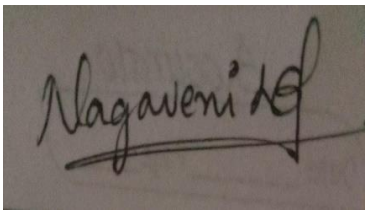
```
.data
str: .asciz "BUTTERFLY"
char: .asciz "G"
.equ swi_writec,0x02
.equ swi_exit,0x11
.text
ldr r0,=str
ldr r1,=char
mov r5,#00
ldrb r3,[r1]
loop:
ldrb r2,[r0],#1
cmp r2,#0
beq exit
cmp r2,r3
bne loop
add r5,r5,#1
b loop
ldr r0,=str
swi swi_writec
exit: swi swi_exit
.end
```


RegistersView
General Purpose
Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :4170
R1 :4170
R2 :0
R3 :71
R4 :0
R5 :0
R6 :0
R7 :0
R8 :0
R9 :0
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):70656
R14(lr):0
R15(pc):4148
CPSR Register
Negative(N):0
Zero(Z) :1
Carry(C) :1
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T) :0
CPU Mode :System
0x600000df
CodeView
w64.o
.data
00001040:54545542 str: .asciz "BUTTERFLY"
:4C465245
:0059
0000104A:0047 char: .asciz "G"
.equ swi_writec,0x02
.equ swi_exit,0x11
.text
00001000:E59F0030 ldr r0,=str
00001004:E59F1030 ldr r1,=char
00001008:E3A05000 mov r5,#00
0000100C:E5D13000 ldrb r3,[r1]
loop:
00001010:E4D02001 ldrb r2,[r0],#1
00001014:E3520000 cmp r2,#0
00001018:0A000005 beq exit
0000101C:E1520003 cmp r2,r3
00001020:1AFFFFFA bne loop
00001024:E2855001 add r5,r5,#1
00001028:EAFFFFF8 b loop
0000102C:E59F0004 ldr r0,=str
00001030:EF000002 swi swi_writec
00001034:EF000011 exit: swi swi_exit
00001038:00000000 .end
:0000000A
OutputView
Console
stdin/stdout/stderr
Loading assembly language file C:\Users\Praka\Downloads\w64.s
Execution starting ...
Execution ending, Instruction Count:53 Elapsed Time:00:00:00.0040005
Instructions per second:13248

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.

SIGNATURE



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Section: F
Date: 24-02-2023