Microprocessor and Computer Architecture

UE21CS251B

4th Semester, Academic Year 2021-22

Date:

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Include in your submission

ARM Assembly Code

Output Screen Shot

Week#____7_____ Program Number: ____1___

Title of the Program

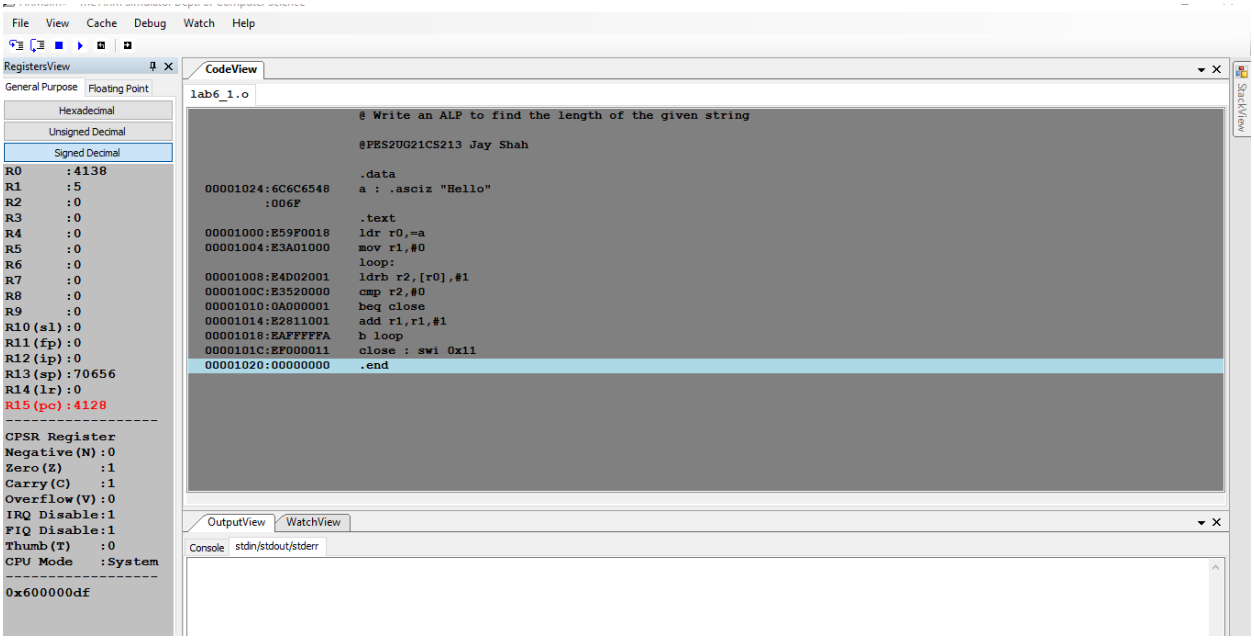
1. **Write an ALP to find the length of a given string**

Code:

```
.data
a : .asciz "Hello"
.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 0x11
.end
```

Output Screenshot:



Week#____7_____ Program Number: ____2___

Title of the Program

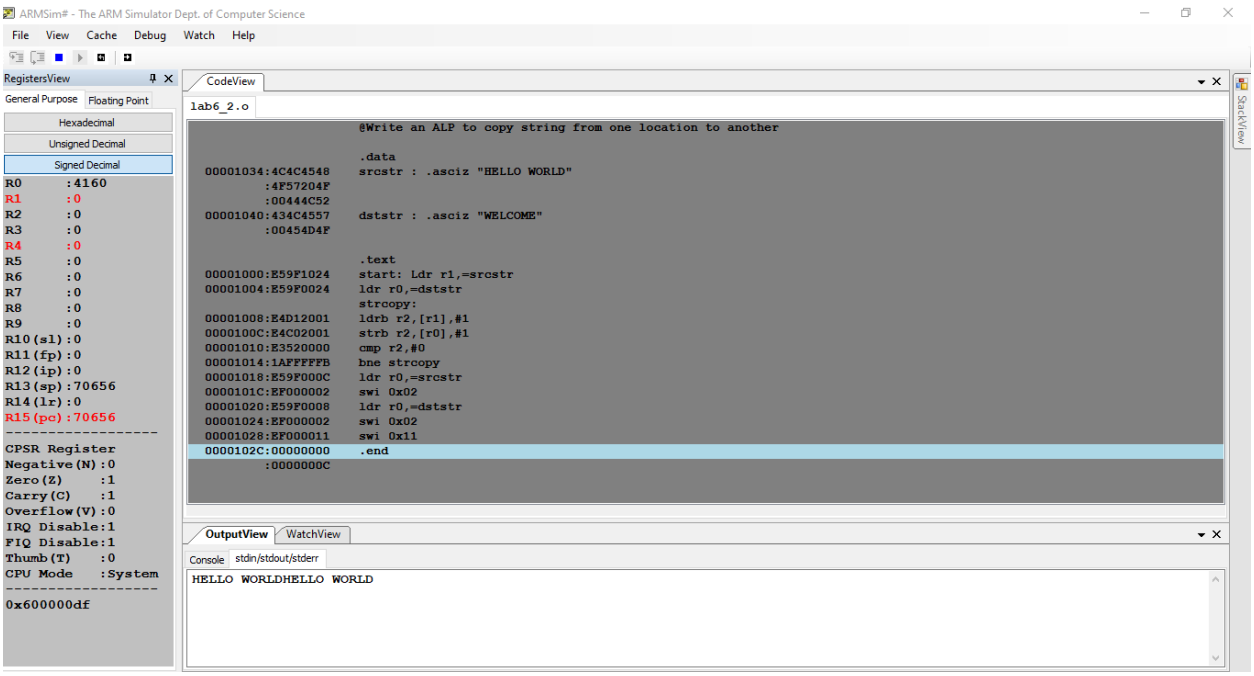
2. **Write an ALP to copy string from one location to another**

Code:

```
.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 0x1
.end
```

Output Screenshot:


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 :4160
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):70656
R14(lr):0
R15(pc):70656
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
lab6_2.o
@Write an ALP to copy string from one location to another
.data
00001034:4C4C4548 srcstr : .asciz "HELLO WORLD"
:4F57204F
:00444C52
00001040:434C4557 dststr : .asciz "WELCOME"
:00454D4F
.text
00001000:E59F1024 start: Ldr r1,=srcstr
00001004:E59F0024 ldr r0,=dststr
strcopy:
00001008:E4D12001 ldrb r2,[r1],#1
0000100C:E4C02001 strb r2,[r0],#1
00001010:E3520000 cmp r2,#0
00001014:1AFFFFFB bne strcopy
00001018:E59F000C ldr r0,=srcstr
0000101C:EF000002 swi 0x02
00001020:E59F0008 ldr r0,=dststr
00001024:EF000002 swi 0x02
00001028:EF000011 swi 0x11
0000102C:00000000 .end
:0000000C
OutputView WatchView
Console stdin/stdout/stderr
HELLO WORLDHELLO WORLD
StackView

Week#____7_____ Program Number: ____3___

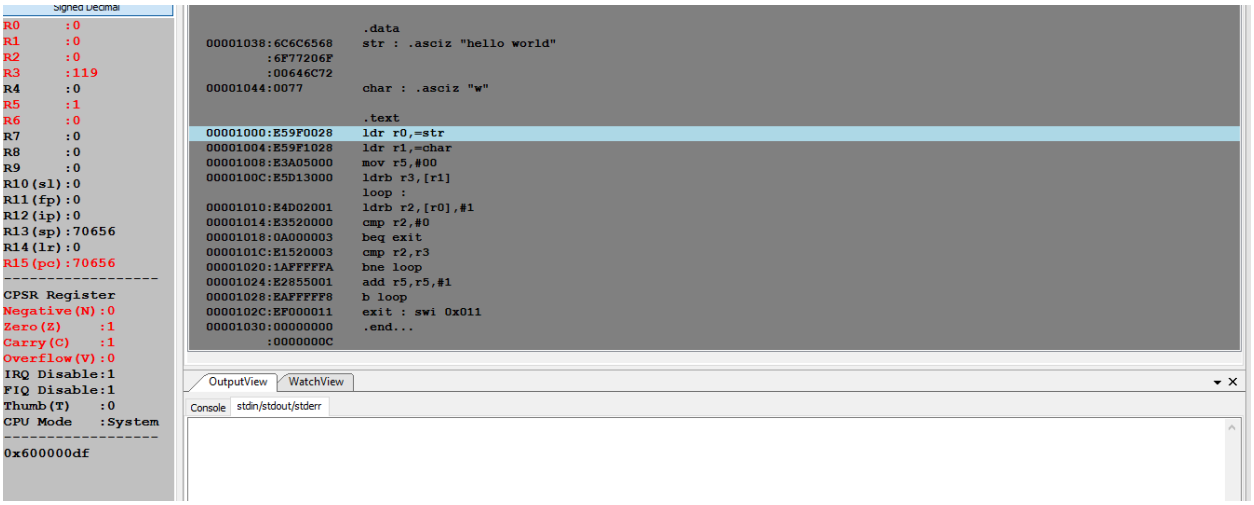
Title of the Program

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

Code:

```
data
str : .asciz "hello world"
char : .asciz "w"
.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
exit : swi 0x011
.end
```

Output Screenshot:


Signed Decimal
R0 :0
R1 :0
R2 :0
R3 :119
R4 :0
R5 :1
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):70656
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
.data
00001038:6C6C6568 str : .asciz "hello world"
:6F77206F
:00646C72
00001044:0077 char : .asciz "w"
.text
00001000:E59F0028 ldr r0,=str
00001004:E59F1028 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
00001018:0A000003 beq exit
0000101C:E1520003 cmp r2,r3
00001020:1AFFFFFA bne loop
00001024:E2855001 add r5,r5,#1
00001028:EAFFFFF8 b loop
0000102C:EF000011 exit : swi 0x011
00001030:00000000 .end...
:0000000C
OutputView
WatchView
Console
stdin/stdout/stderr

Week#____7_____ Program Number: ____4___

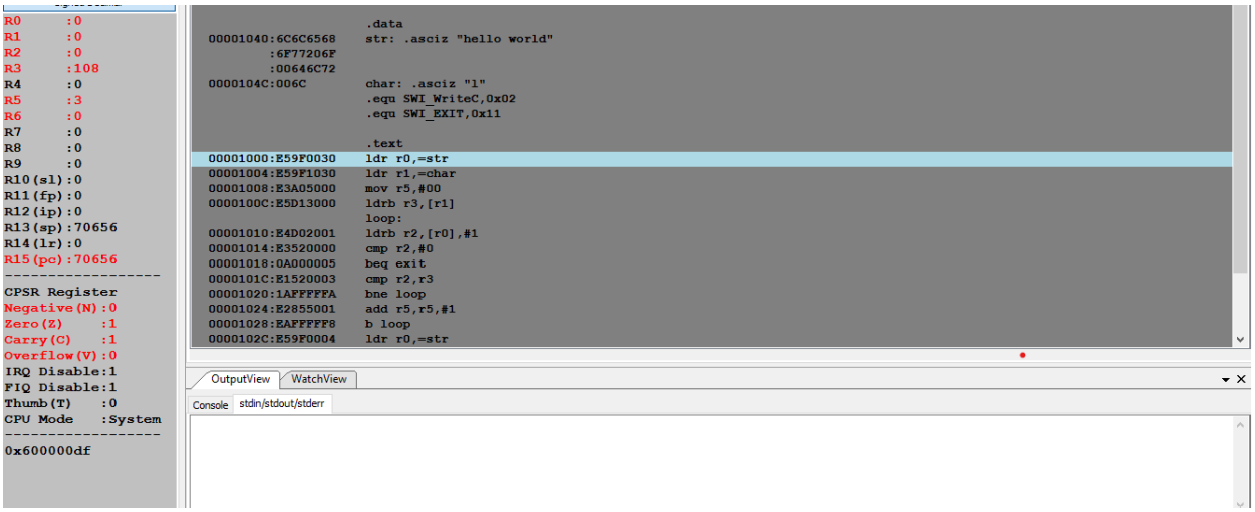
Title of the Program

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

Code:

```
.data
str: .asciz "hello world"
char: .asciz "l"
.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
```

Output Screenshot:



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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