

**MICROPROCESSOR AND COMPUTER ARCHITECTURE  
LABORATORY**

**UE19CS256**

**4TH SEMESTER, ACADEMIC YEAR 2020-21**

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**Date: 04-03-2021**

**Week#5**

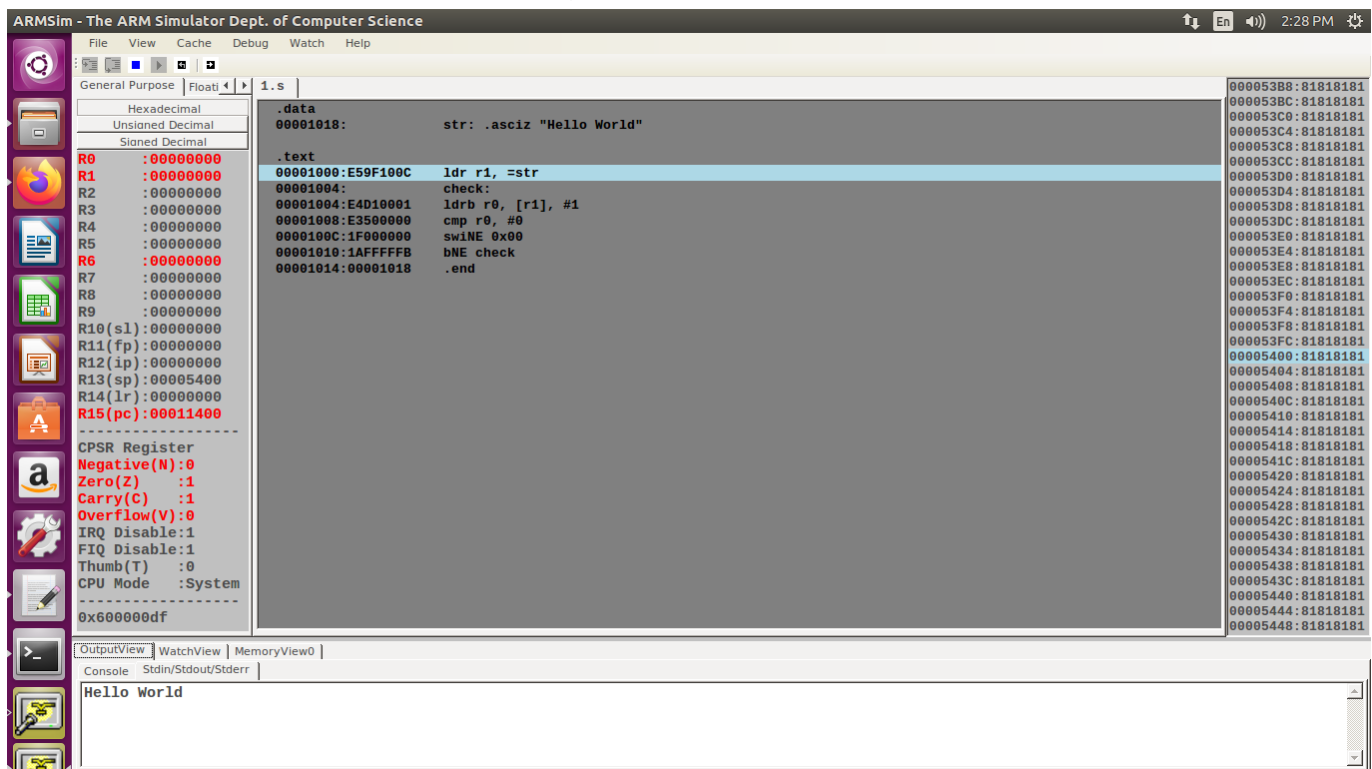
# Program Number: 1

## Write an ALP to display Hello World

### I. ARM Assembly Code

```
[oi] Week5_Program1_PES2UG19CS075.s
1  .data
2      str: .asciz "Hello World"
3
4  .text
5      ldr r1, =str
6      check:
7          ldrb r0, [r1], #1
8          cmp r0, #0
9          swiNE 0x00
10         bNE check
11 .end
12
```

### II. Output Screen Shot



## Program Number: 2

Write an ALP to find the length of a given string

### I. ARM Assembly Code

```
[10] Week5_Program2_PES2UG19CS075.s
1  .data
2      str: .asciz "Hello"
3
4  .text
5      ldr r0, =str
6      mov r1, #0
7      check:
8          ldrb r2, [r0], #1
9          cmp r2, #0
10         addNE r1, r1, #1
11         bNE check
12     swi 0x11
13     .end
14
```

### II. Output Screen Shot

The screenshot displays the ARMSim - The ARM Simulator interface. The main window shows the assembly code being executed, with the instruction `swi 0x11` highlighted. The register window on the left shows the state of the registers, with R15 (PC) at 00001018. The output window at the bottom shows the execution progress, including the instruction count and elapsed time.

ARMSim - The ARM Simulator Dept. of Computer Science

File View Cache Debug Watch Help

General Purpose | Float | 2. s

Hexadecimal  
Unsigned Decimal  
Signed Decimal

R0 : 00001026  
R1 : 00000005  
R2 : 00000000  
R3 : 00000000  
R4 : 00000000  
R5 : 00000000  
R6 : 00000000  
R7 : 00000000  
R8 : 00000000  
R9 : 00000000  
R10 (s1): 00000000  
R11 (fp): 00000000  
R12 (ip): 00000000  
R13 (sp): 00005400  
R14 (lr): 00000000  
R15 (pc): 00001018

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  
00001020: str: .asciz "Hello"

.text  
00001000:E59F0014 ldr r0, =str  
00001004:E3A01000 mov r1, #0  
00001008: check:  
00001008:E4D02001 ldrb r2, [r0], #1  
0000100C:E3520000 cmp r2, #0  
00001010:12811001 addNE r1, r1, #1  
00001014:1AFFFFFB bNE check  
00001018:EF000011 swi 0x11  
0000101C:00001020 .end

OutputView | WatchView | MemoryView0 |  
Console | Stdin/Stdout/Stderr |

Execution starting ...

Execution ending, Instruction Count:27 Elapsed Time:00:00:00.0041590  
Instructions per second:6491

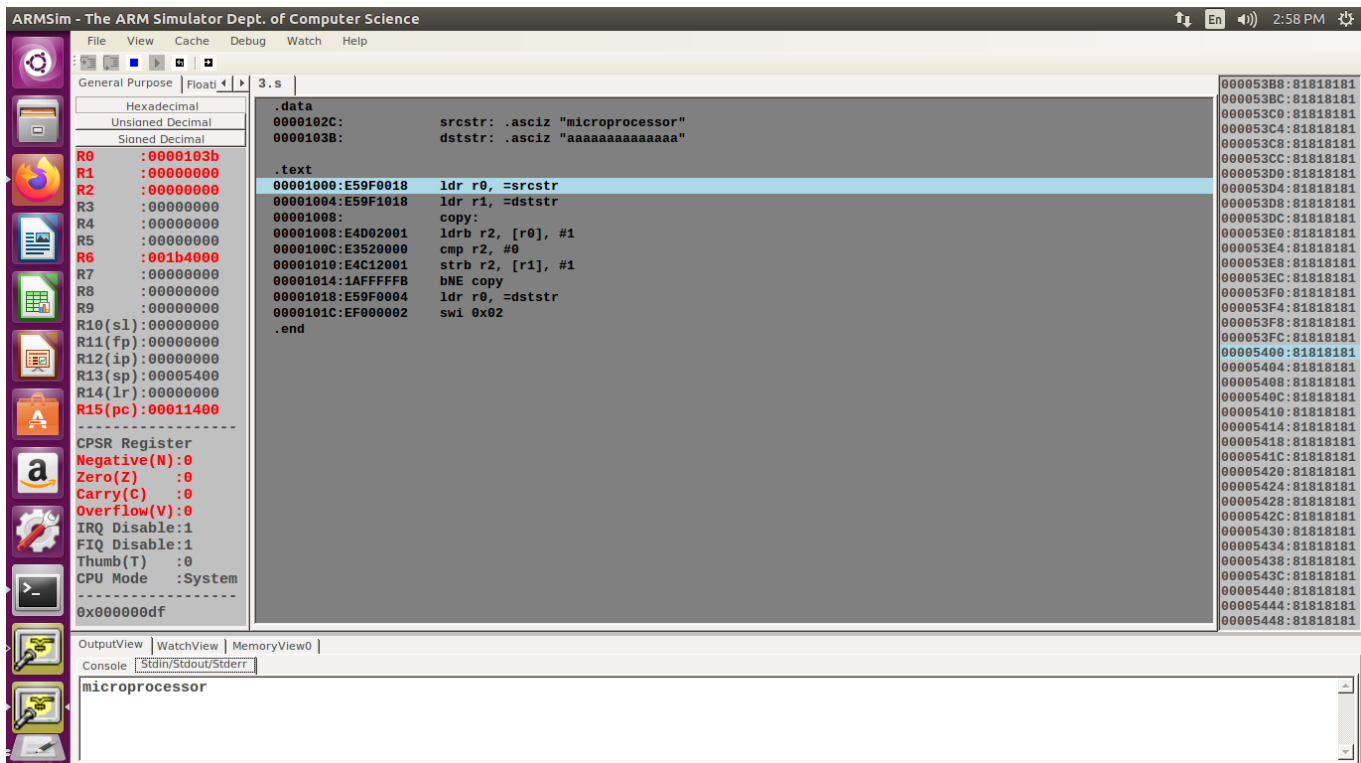
## Program Number: 3

Write an ALP to copy string from one location to another

### I. ARM Assembly Code

```
Week5_Program3_PES2UG19CS075.s
1  .data
2      srcstr: .asciz "microprocessor"
3      dststr: .asciz "aaaaaaaaaaaaa"
4
5  .text
6      ldr r0, =srcstr
7      ldr r1, =dststr
8      copy:
9          ldrb r2, [r0], #1
10         cmp r2, #0
11         strb r2, [r1], #1
12         bNE copy
13         ldr r0, =dststr
14         swi 0x02
15     .end
16
```

### II. Output Screen Shot



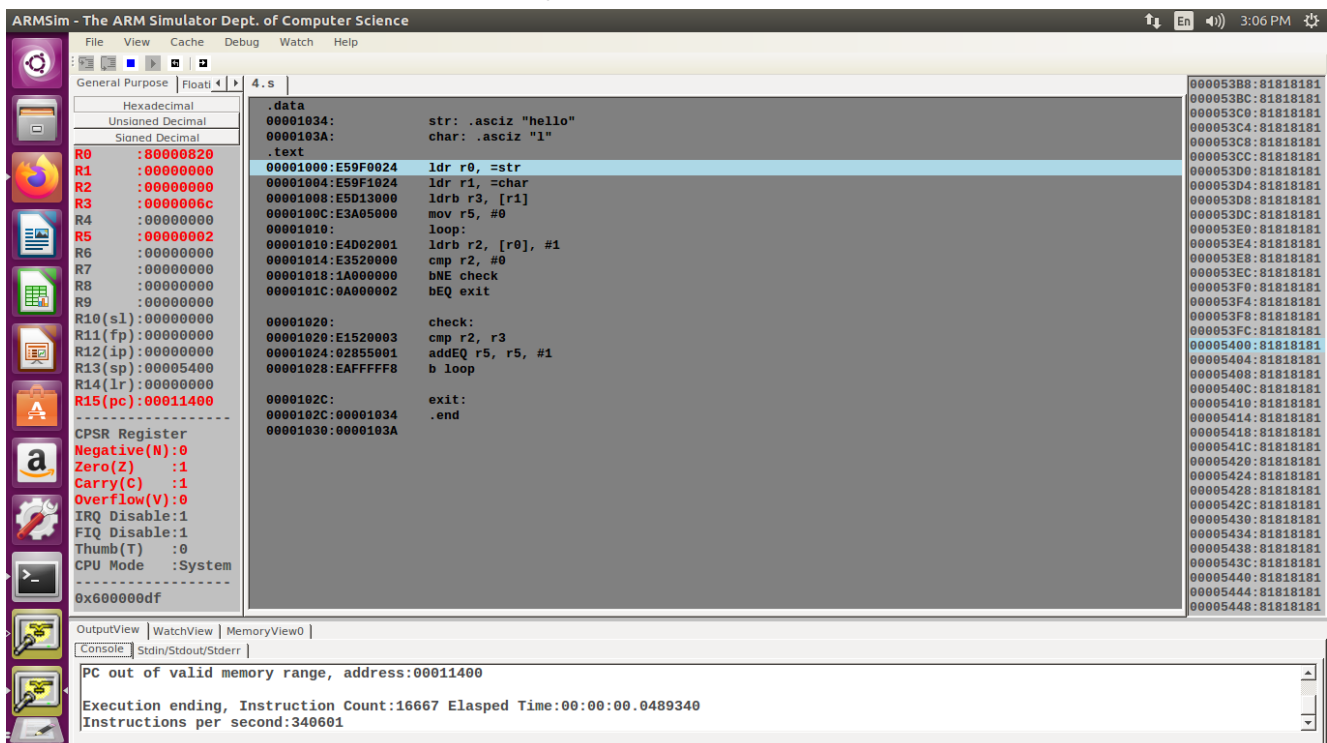
## Program Number: 4

Write an ALP to find whether a given character is present in a string. If present, find how many times the given character is present in a string.

### I. ARM Assembly Code

```
[0] Week5_Program4_PES2UG19CS075.s
1  .data
2      str: .asciz "hello"
3      char: .asciz "l"
4  .text
5      ldr r0, =str
6      ldr r1, =char
7      ldrb r3, [r1]
8      mov r5, #0
9      loop:
10         ldrb r2, [r0], #1
11         cmp r2, #0
12         bNE check
13         bEQ exit
14
15     check:
16         cmp r2, r3
17         addEQ r5, r5, #1
18         b loop
19
20     exit:
21     .end
22
```

### II. Output Screen Shot



### **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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Date: **04-03-2021**