Microprocessor and Computer Architecture Laboratory

UE19CS256

4th Semester, Academic Year 2020-21
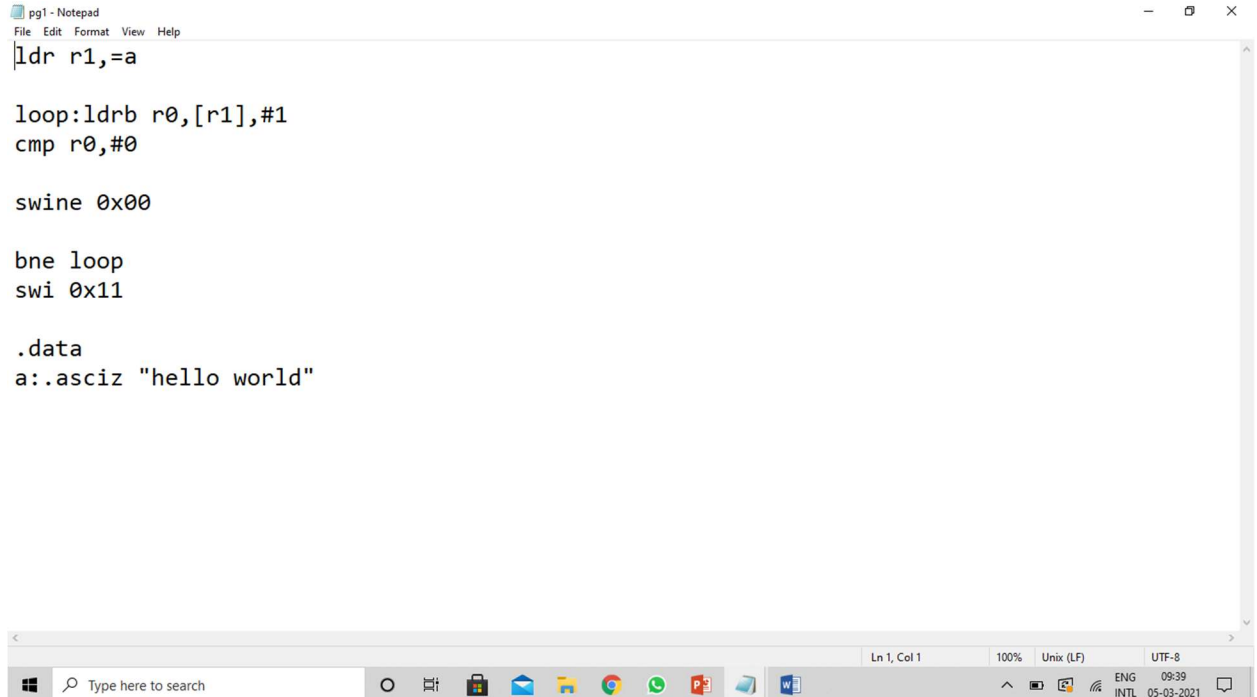
Date:

Name: Achyut Jagini	SRN:PES2UG19CS013	Section A

Week#_____5_____   Program Number: _____1__

Write an ALP to display hello world


```
ldr r1,=a

loop:ldrb r0,[r1],#1
cmp r0,#0

swine 0x00

bne loop
swi 0x11

.data
a:.asciz "hello world"
```

```
.text
ldr r0,=a
mov r1,#0

loop:
add r0,r0,#1

ldrb r2,[r0]
add r1,r1,#1

cmp r2,#0
bne loop



swi 0x11

.data
a:.asciz "hello"
```

ARMSim - The ARM Simulator Dept. of Computer Science

File   View   Cache   Debug   Watch   Help

General Purpose | Floati ◄ ► | pg1.s

Hexadecimal		
Unsigned Decimal		
Signed Decimal		
R0 :108		
R1 :4128		
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):21504		
R14(lr):0		
R15(pc):4104		

CPSR Register		
Negative(N):0		
Zero(Z) :0		
Carry(C) :1		
Overflow(V):0		
IRQ Disable:1		
FIQ Disable:1		

```
00001000:E59F1010    ldr r1,=a

00001004:E4D10001    loop:ldrb r0,[r1],#1
00001008:E3500000    cmp r0,#0

0000100C:1F000000    swine 0x00

00001010:1AFFFFFB    bne loop
00001014:EF000011    swi 0x11

.data
0000101C:            a:.asciz "hello world"
```

```
000053C0:81818181
000053C4:81818181
000053C8:81818181
000053CC:81818181
000053D0:81818181
000053D4:81818181
000053D8:81818181
000053DC:81818181
000053E0:81818181
000053E4:81818181
000053E8:81818181
000053EC:81818181
000053F0:81818181
000053F4:81818181
000053F8:81818181
000053FC:81818181
00005400:81818181
00005404:81818181
00005408:81818181
0000540C:81818181
00005410:81818181
00005414:81818181
00005418:81818181
0000541C:81818181
00005420:81818181
00005424:81818181
00005428:81818181
0000542C:81818181
00005430:81818181
00005434:81818181
00005438:81818181
0000543C:81818181
```

OutputView | WatchView
Console | Stdin/Stdout/Stderr

```
Loading assembly language file /home/achyutjagini/armsim/week5/pg1.s
Execution starting ...

Execution ending, Instruction Count:26 Elasped Time:00:00:00.0060100
Instructions per second:4326
```

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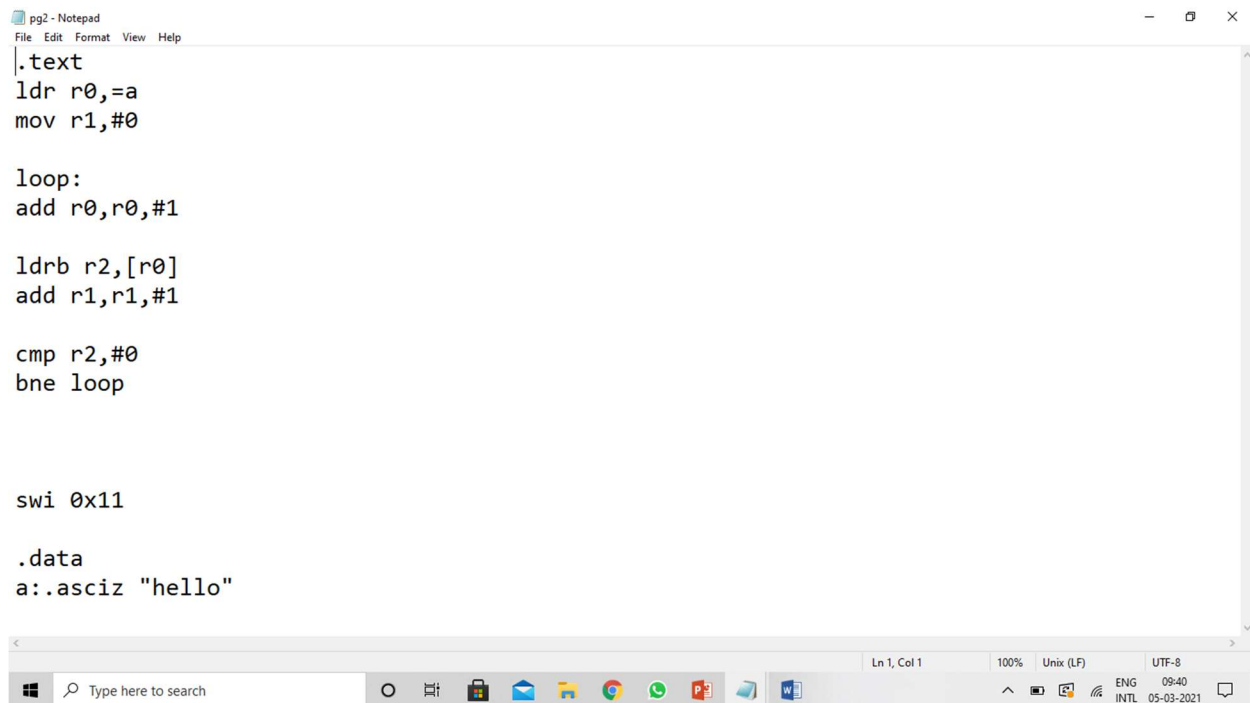
Date:

Name:	SRN:	Section

Week#_____5_____   Program Number: _____2__

Write an ALP to find the length of a given string

```
.text
ldr r0,=a
mov r1,#0

loop:
add r0,r0,#1

ldrb r2,[r0]
add r1,r1,#1

cmp r2,#0
bne loop



swi 0x11

.data
a:.asciz "hello"
```
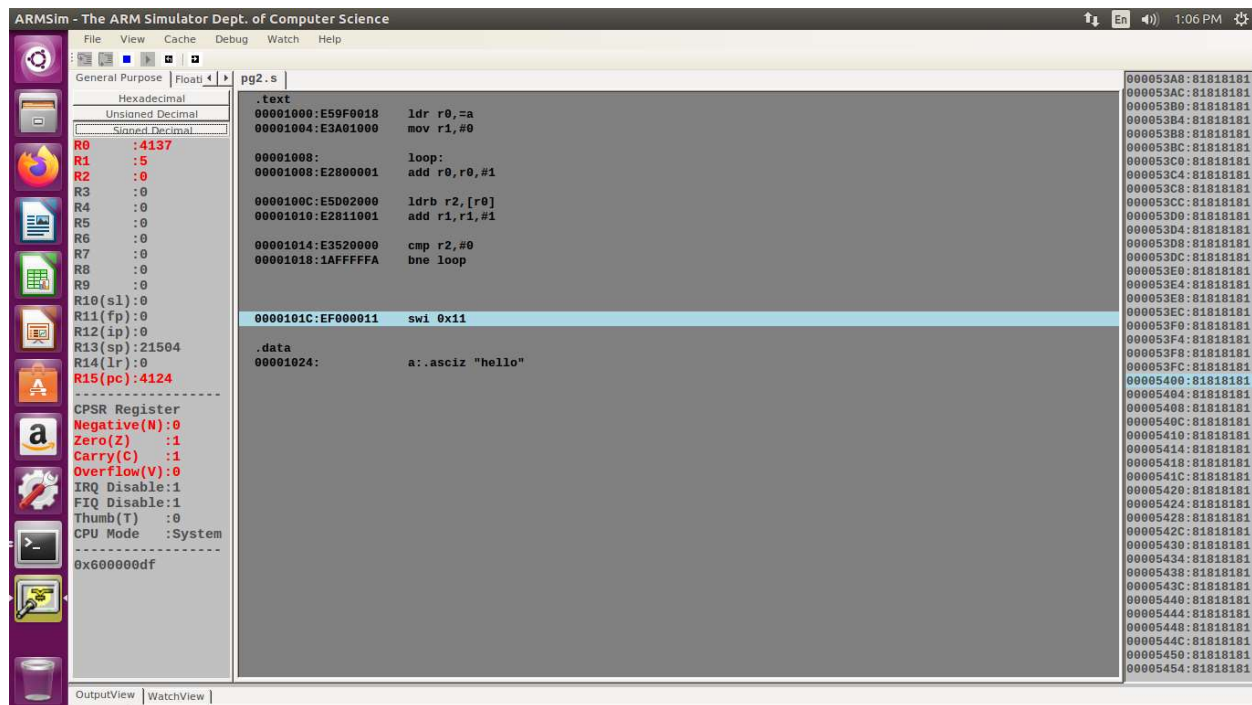
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4th Semester, Academic Year 2020-21

Date:

Name:	SRN:	Section

Week#____5_____   Program Number: ____3__

Write an ALP to copy string from one location to another

```
ldr r0,=srcstr
ldr r1,=dststr
A:
ldrb r2,[r0]
add r0,r0,#1

str r2,[r1]

add r1,r1,#1
@ldrb r2,[r0]
cmp r2,#0

bne A
swi 0x02
.data
srcstr:.asciz "pesu"
dststr:.asciz "aaaa"
```

ARMSim - The ARM Simulator Dept. of Computer Science

File   View   Cache   Debug   Watch   Help

RegistersView   pg3.s

General Purpose   Floating Point

Hexadecimal
Unsigned Decimal
Signed Decimal

```
R0      :4141
R1      :4145
R2      :112
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):21504
R14(lr):0
R15(pc):4116
------------------
CPSR Register
Negative(N):0
Zero(Z)    :0
Carry(C)   :0
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T)   :0
CPU Mode   :System
------------------
0x000000df
```

```
00001000:E59F001C    ldr r0,=srcstr
00001004:E59F101C    ldr r1,=dststr
00001000:            A:
00001008:E5D02000    ldrb r2,[r0]
0000100C:E2800001    add r0,r0,#1

00001010:E5812000    str r2,[r1]

00001014:E2811001    add r1,r1,#1
                     @ldrb r2,[r0]
00001018:E3520000    cmp r2,#0

0000101C:1AFFFFF9    bne A
00001020:EF000002    swi 0x02
                     .data
0000102C:            srcstr:.asciz "pesu"
00001031:            dststr:.asciz "aaaa"
```

StackView

MemoryView0

Word Size
8Bit 16Bit 32Bit

```
00000000
00000000  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
0000002C  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
00000058  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
00000084  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
```

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4th Semester, Academic Year 2020-21

Date:

Name:	SRN:	Section

Week#_____5_____   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.

```
ldr r0,=str
ldr r1,=char


a:
ldrb r3,[r1] @key character in r3
ldrb r2,[r0] @string character in r2

add r0,r0,#1
cmp r2,r3

addeq r5,r5,#1
cmp r2,#0

bne a


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

RegistersView

General Purpose Floating Point

Hexadecimal
Unsigned Decimal
Signed Decimal

```
R0      :-2147481572
R1      :0
R2      :0
R3      :108
R4      :0
R5      :2
R6      :0
R7      :0
R8      :0
R9      :0
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):21504
R14(lr):0
R15(pc):4164
-------------------
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
```

4self.s

```
00001000:E59F001C    ldr r0,=str
00001004:E59F101C    ldr r1,=char

00001008:            a:
00001008:E5D13000    ldrb r3,[r1] @key character in r3
0000100C:E5D02000    ldrb r2,[r0] @string character in r2

00001010:E2800001    add r0,r0,#1
00001014:E1520003    cmp r2,r3

00001018:02855001    addeq r5,r5,#1
0000101C:E3520000    cmp r2,#0

00001020:1AFFFFF8    bne a

                     .data
0000102C:            str:.asciz "hello"

00001032:            char:.asciz "l"
```

MemoryView0

```
Word Size
                                                      8Bit  16Bit  32Bit
00000000
00000000  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
0000002C  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
00000058  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
00000084  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????  ????????
```