Computer Organization and Architecture

CCCS 217

Part 2

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Code

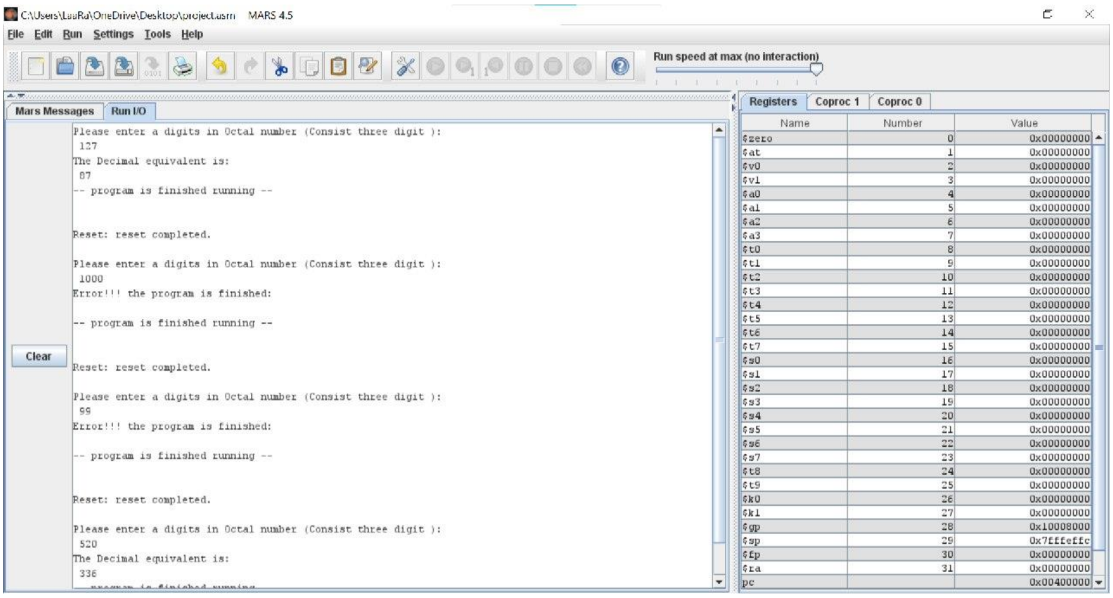
```
.data

startMassage:   .asciiz "Please enter a digits in Octal number (Consist three digit ):\n "
result:   .asciiz "The Decimal equivalent is:\n "
error: .asciiz "Error!!! the program is finished:\n "

.text

main:

   # load the service 4 is to print string
   li $v0, 4
   #  address of string in memory of the startMassage
   la $a0, startMassage
   # print startMassage
   syscall

   # load the service 5 to read intger
   li $v0, 5
   # to read the octal number from user
   syscall

   # store the result in &t0
   move $t0, $v0

   # load 0 into $t1
   # decimal value in loop
   li $t1, 0

   # load 1 into $t2
```

```
    # i value in loop
    li $t2, 1

    # initialization value to cheack if input between 100 and 999

     li $t3,100 #b
     li $t4,999 #c

    # input a<b 100, if the condition is true jump to error1 method to finished program
    blt $t0,$t3,error1

    # input a>c 999, if the condition is true jump to error1 method
    bgt $t0,$t4,error1

    # input a>=b 100, if the condition is true jump to grater method
    bge $t0,$t3,grater

    grater:

    # input a<=c 999, if the condition is true jump to loop
    ble $t0,$t4,loop



loop:
    # get the last digit in $t5 using remainder
    rem $t5, $t0, 10

    # remove the last digit from $t0 using division
    div $t0, $t0, 10

    # multiply the last digit by 8^i
```

```
mul $t5, $t5, $t2

# add $t5 to $t1 , $t1=0
add $t1, $t1, $t5

# multiply $t2 by 8
mul $t2, $t2, 8

# branch to loop if $t0 is not 0 will go to loop agian
bne $t0, $zero, loop

# move $t1 >> the result from loop to $t0
move $t0, $t1



#         finshed the loop          #



# print the result
# load the service 4 is to print string
li $v0, 4
#  address of string in memory of the result message
la $a0, result
syscall

# print the decimal equivalent
# move $t0 to $a0
move $a0, $t0
# load the service 1 is to print integer
li $v0, 1
syscall
```

```
exit:

   # by this exit program

   li $v0, 10

   # print the result message

   syscall


error1:

   # load the service 4 is to print string

   li $v0, 4

   #  address of string in memory of the error message

   la $a0, error

   # print the result

   syscall

   # exit program

   li $v0, 10

   # print the result message

   syscall
```

Output:


C:\Users\LaaRa\OneDrive\Desktop\project.asm MARS 4.5
File
Edit
Run
Settings
Tools
Help
Run speed at max (no interaction)
Mars Messages
Run I/O
Clear
Registers
Coproc 1
Coproc 0

```
Please enter a digits in Octal number (Consist three digit ):
 127
The Decimal equivalent is:
 87
-- program is finished running --


Reset: reset completed.

Please enter a digits in Octal number (Consist three digit ):
 1000
Error!!! the program is finished:

-- program is finished running --


Reset: reset completed.

Please enter a digits in Octal number (Consist three digit ):
 99
Error!!! the program is finished:

-- program is finished running --


Reset: reset completed.

Please enter a digits in Octal number (Consist three digit ):
 520
The Decimal equivalent is:
 336
-- program is finished running --
```

Name	Number	Value
$zero	0	0x00000000
$at	1	0x00000000
$v0	2	0x00000000
$v1	3	0x00000000
$a0	4	0x00000000
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000000
$t1	9	0x00000000
$t2	10	0x00000000
$t3	11	0x00000000
$t4	12	0x00000000
$t5	13	0x00000000
$t6	14	0x00000000
$t7	15	0x00000000
$s0	16	0x00000000
$s1	17	0x00000000
$s2	18	0x00000000
$s3	19	0x00000000
$s4	20	0x00000000
$s5	21	0x00000000
$s6	22	0x00000000
$s7	23	0x00000000
$t8	24	0x00000000
$t9	25	0x00000000
$k0	26	0x00000000
$k1	27	0x00000000
$gp	28	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400000