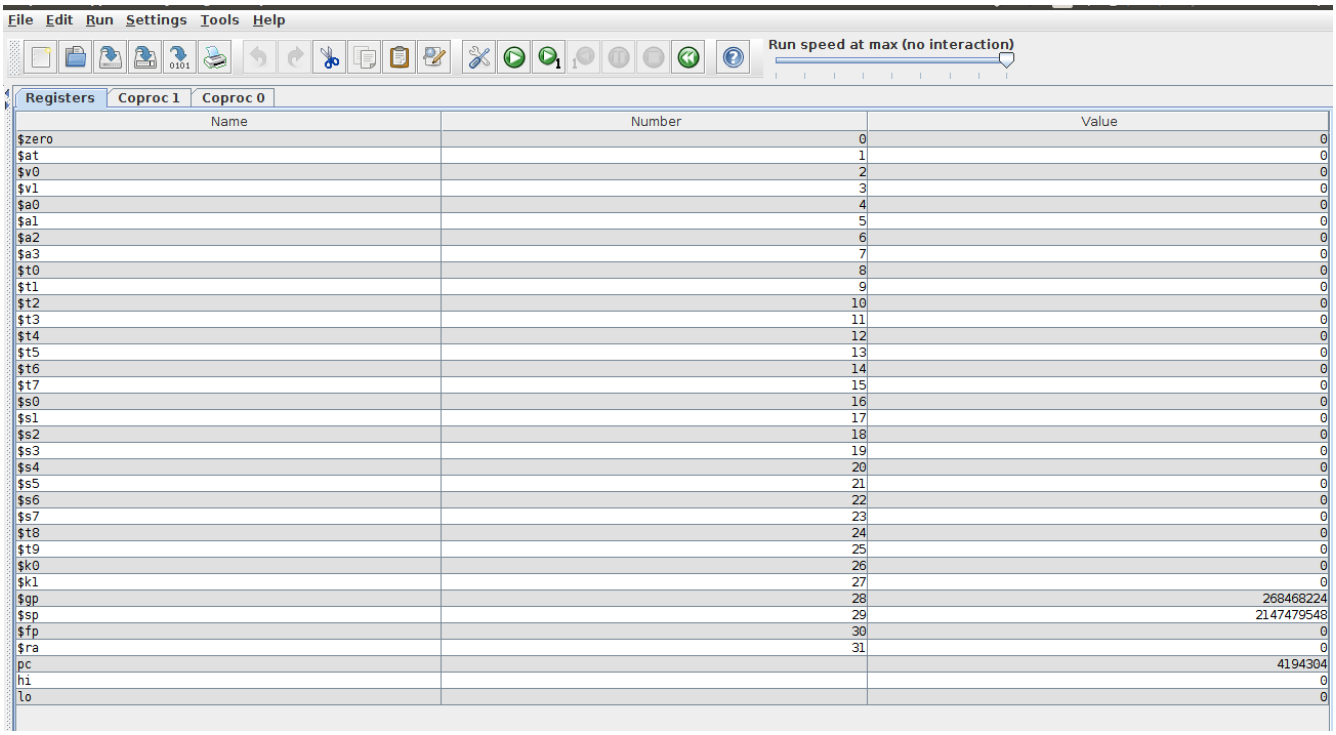
```
#LabPart1.asm

#Z = (A-B) * (C+D) + (E-F) - (A/C);

#############################################################
#                                                           #
#               DTAT SEGMENT                        #
#                                                           #
#############################################################

.data

        A: .word  15       # int A = 15
        B: .word  10       # int B = 10
        C: .word  5        # int C = 5
        D: .word  2        # int D = 2
        E: .word  18       # int E = 18
        F: .word  -3       # int F = -3
        Z: .word  0        # int Z = 0


#############################################################
#                                                           #
#               TEXT SEGMENT                        #
#             MAIN CODE START NOW                   #
#                                                           #
#############################################################

.text

main:

        lw $t0, A          #load word $t0 = A = 15
        lw $t1, B          #load word $t1 = B = 10
        subu $t0, $t0, $t1   # $t0 = A-B = $t0 - $t1


        lw $t1, C          # load word $t1 = C = 5
        lw $t2, D          # load word $t0 = D = 2
        addu $t1, $t1, $t2   # $t1 = C+D = $t1 + $t2


        mult $t0, $t1       # (A-B) * (C+D) = $t0 * $t1

        mflo $t0           # $t0 = lo = (A-B) * (C+D) = $t0 * $t1


        lw $t1, E          # load word $t1 = E = 18
```

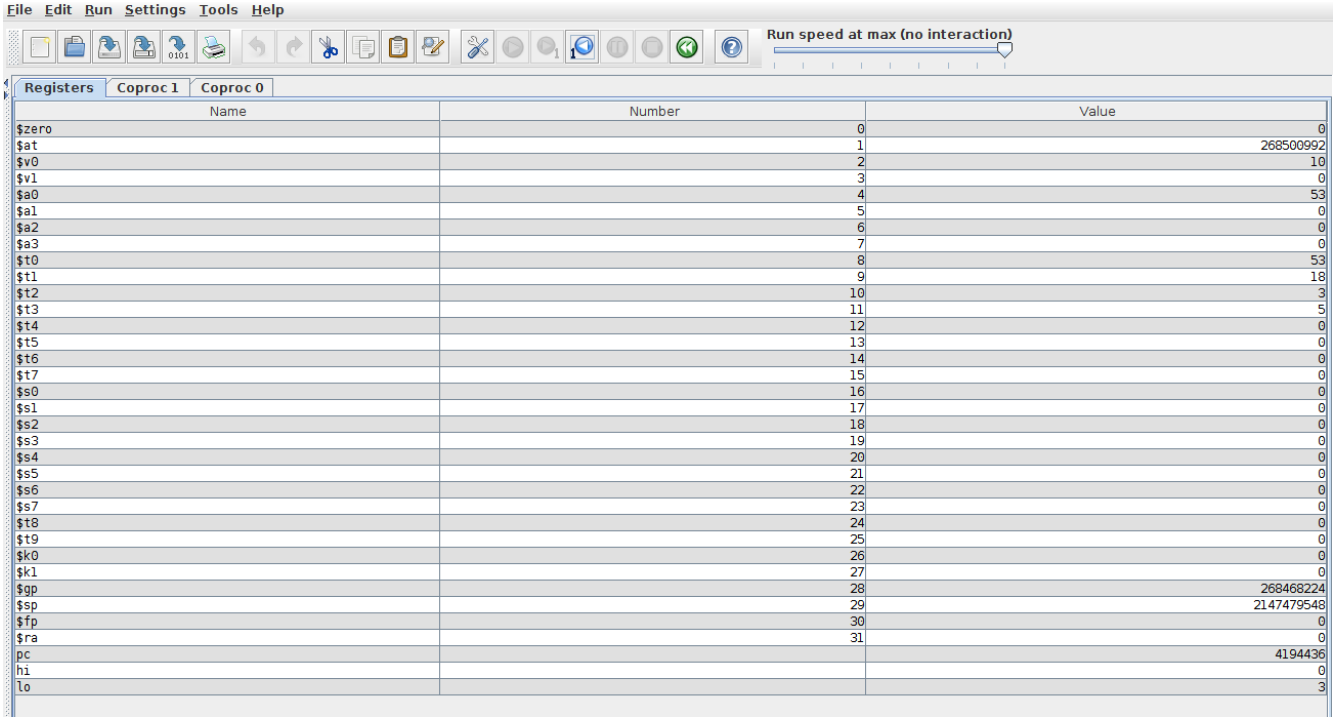
```
        lw $t2, F           # load word $t1 = F = -3
        subu $t1, $t1, $t2   # $t1  = E-F = $t1 - $t2


        lw $t2, A           # load word $t2 = A = 15
        lw $t3, C           # load word $t3 = C = 5
        div $t2, $t3         #  A/C = $t2 / $t3


        mflo $t2            # $t2 = lo = A/C = $t2 / $t3

        subu $t1, $t1, $t2   # $t1 = (E-F) - (A/C) = $t1 - $t2

        addu $t0, $t0, $t1   # $t0  = (A-B) * (C+D) + (E-F) - (A/C) = $t0 + $t1

        sw $t0, Z           # store word Z = $t0




        lw $a0, Z           # load word $a0 = Z
        li $v0, 1           # print the integer $a0
        syscall



#####################################################
#                                   #
#           EXIT FROM PROGRAM             #
#                                   #
#####################################################

exit:

        li $v0, 10          # exit
        syscall
```

1. Two screenshots of the MIPS register panel:
Before program runs:



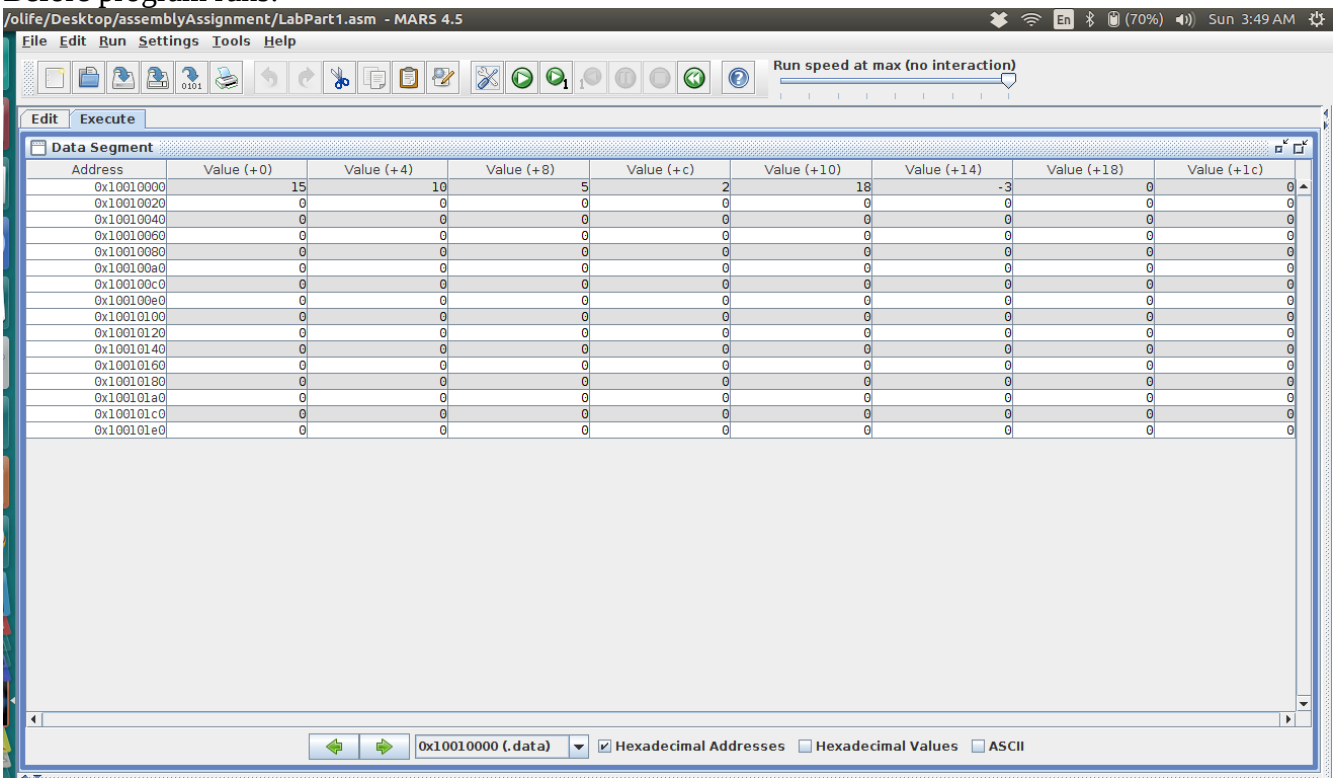

| Name | Number | Value |
|---|---|---|
| $zero | 0 | 0 |
| $at | 1 | 0 |
| $v0 | 2 | 0 |
| $v1 | 3 | 0 |
| $a0 | 4 | 0 |
| $a1 | 5 | 0 |
| $a2 | 6 | 0 |
| $a3 | 7 | 0 |
| $t0 | 8 | 0 |
| $t1 | 9 | 0 |
| $t2 | 10 | 0 |
| $t3 | 11 | 0 |
| $t4 | 12 | 0 |
| $t5 | 13 | 0 |
| $t6 | 14 | 0 |
| $t7 | 15 | 0 |
| $s0 | 16 | 0 |
| $s1 | 17 | 0 |
| $s2 | 18 | 0 |
| $s3 | 19 | 0 |
| $s4 | 20 | 0 |
| $s5 | 21 | 0 |
| $s6 | 22 | 0 |
| $s7 | 23 | 0 |
| $t8 | 24 | 0 |
| $t9 | 25 | 0 |
| $k0 | 26 | 0 |
| $k1 | 27 | 0 |
| $gp | 28 | 268468224 |
| $sp | 29 | 2147479548 |
| $fp | 30 | 0 |
| $ra | 31 | 0 |
| pc | | 4194304 |
| hi | | 0 |
| lo | | 0 |

After program runs:

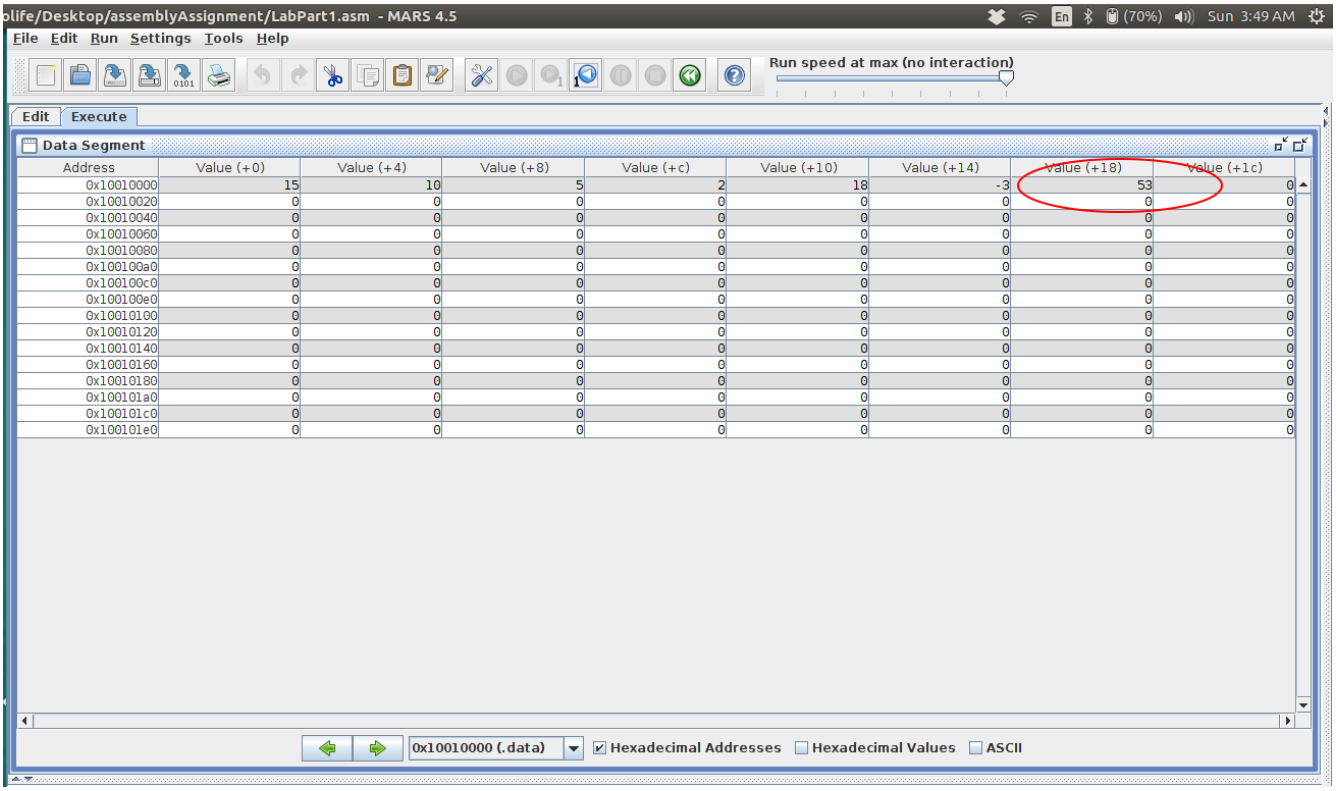



| Name | Number | Value |
|---|---|---|
| $zero | 0 | 0 |
| $at | 1 | 268500992 |
| $v0 | 2 | 10 |
| $v1 | 3 | 0 |
| $a0 | 4 | 53 |
| $a1 | 5 | 0 |
| $a2 | 6 | 0 |
| $a3 | 7 | 0 |
| $t0 | 8 | 53 |
| $t1 | 9 | 18 |
| $t2 | 10 | 3 |
| $t3 | 11 | 5 |
| $t4 | 12 | 0 |
| $t5 | 13 | 0 |
| $t6 | 14 | 0 |
| $t7 | 15 | 0 |
| $s0 | 16 | 0 |
| $s1 | 17 | 0 |
| $s2 | 18 | 0 |
| $s3 | 19 | 0 |
| $s4 | 20 | 0 |
| $s5 | 21 | 0 |
| $s6 | 22 | 0 |
| $s7 | 23 | 0 |
| $t8 | 24 | 0 |
| $t9 | 25 | 0 |
| $k0 | 26 | 0 |
| $k1 | 27 | 0 |
| $gp | 28 | 268468224 |
| $sp | 29 | 2147479548 |
| $fp | 30 | 0 |
| $ra | 31 | 0 |
| pc | | 4194436 |
| hi | | 0 |
| lo | | 3 |

2. Two screenshots of the MIPS memory panel (data tab):
Before program runs:




After program runs:



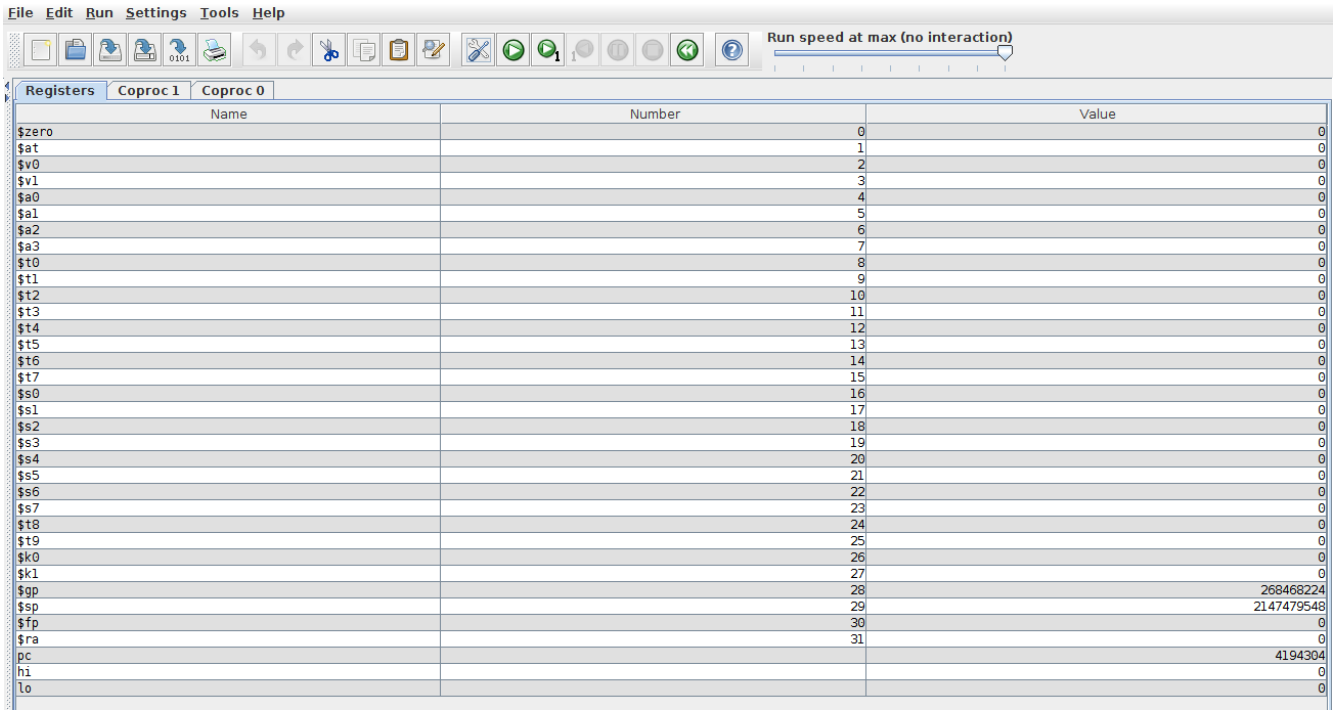
#LabPart2.asm

```
#################################################################
#                                               #
#               DTAT SEGMENT                            #
#                                               #
#################################################################


.data

        A: .word  10       # int A = 10
        B: .word  15       # int B = 15
        C: .word  6        # int C = 6
        Z: .word  0        # int Z = 0


#################################################################
#                                               #
#               TEXT SEGMENT                            #
#             MAIN CODE START NOW                       #
#                                               #
#################################################################
.text

main:

        lw $t0, A                       # load word $t0 = 15
        lw $t1, B                       # load word $t1 = 10
        lw $t2, C                       # load word $t2 = 6

#################################################################
#                                               #
#         if(A > B || ((C+1) == 7))                 #
#                                               #
#################################################################

        bgt $t0, $t1, ifAction              # if (A>B) then jump ifAction
        addiu $t3, $t2, 1                   # $t3 = (C+1) = $t2 +1
        li $t4, 7                       # $t4 = 7
        bne $t3, $t4, elseIfCondition       # if ( (C+1)!= 7) = ($t3 != $t4) then jump to elseIfCondition


ifAction:

        li $t5, 1                       # $t5 = 1
        sw $t5, Z                         # store word Z = $t5 = 1

      j switch                      # unConditional jump to switch
```

```
#############################################################
#                                   #
#         else if(A < B && C > 5)                 #
#                                   #
#############################################################

elseIfCondition:

        bgt $t0, $t1, else              # if  (A>B) = ($t0 > $t1) jump to else
        li $t4, 5                       # $t4 = 5
        blt $t2, $t4, else              # if  (C < 5) = ($t2 < $t4) jump to else

        li $t5, 2                       # $t5 = 2
        sw $t5, Z                       # store word Z = $t5 = 2

        j switch                        # unConditional jump to switch

#############################################################
#                                   #
#                 else                    #
#                                   #
#############################################################

else:

        li $t5, 3                       # $t5 = 3
        sw $t5, Z                       # store word Z = $t5 = 3

#############################################################
#                                   #
#               switch(Z)                   #
#                                   #
#############################################################

switch:

        lw $t4, Z                       # load word $t4 = Z

###############       case 1:                 ######################

case1:

        li $t5, 1                       # $t5 = 1
        bne $t4, $t5, case2             # if ($t4 != $t5) then jump to case2
        li $t5, -1                      # $t5 = 0 + (-1)
        sw $t5, Z                       # store word Z = $t5

        j print                         # unConditional jump to print
```

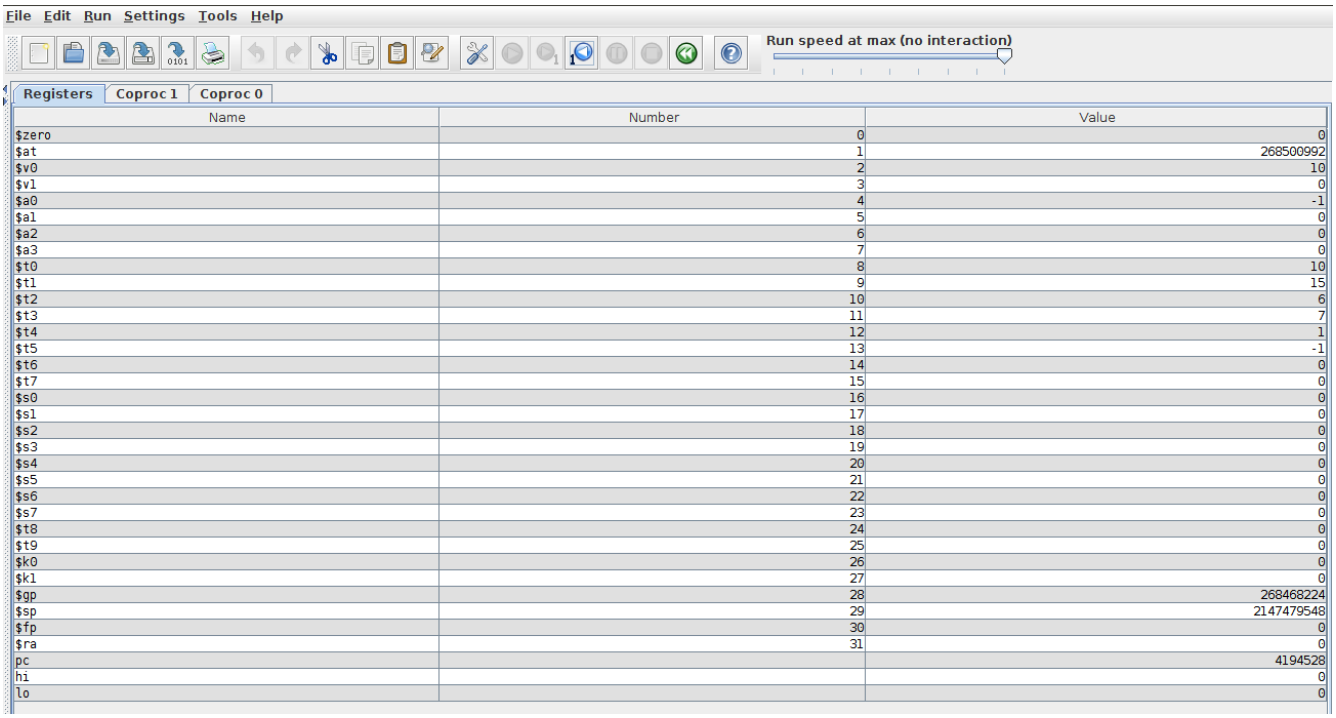
```
###############       case 2:                 ######################

case2:

        li $t5, 2                       # $t5 = 2
        bne $t4, $t5, case3                 # if ($t4 != $t5) then jump to case3
        li $t5, -2                      # $t5 = -2
        sw $t5, Z                         # store word Z = $t5

        j print                         # unConditional jump to print

###############       case 3:                 ######################

case3:

        li $t5, 3                       # $t5 = 3
        bne $t4, $t5, default               # if ($t4 != $t5) then jump to default
        li $t5, -3                      # $t5 = -3
        sw $t5, Z                         # store word Z =$t5

        j print                         # unConditional jump to print

###############       default:        ######################

default:

        li $t5, 0                       # $t5 = 0
        sw $t5, Z                         # store word Z =$t5

##########      print result      ########################

print:

        lw $a0,Z                          # load word from Z to $a0
        li $v0, 1                       # print integer value
        syscall

#########################################################
#                                       #
#           EXIT FROM PROGRAM                   #
#                                       #
#########################################################

exit:

        li $v0, 10                        # exit
        syscall
```

3. Two screenshots of the MIPS register panel:
Before program runs:



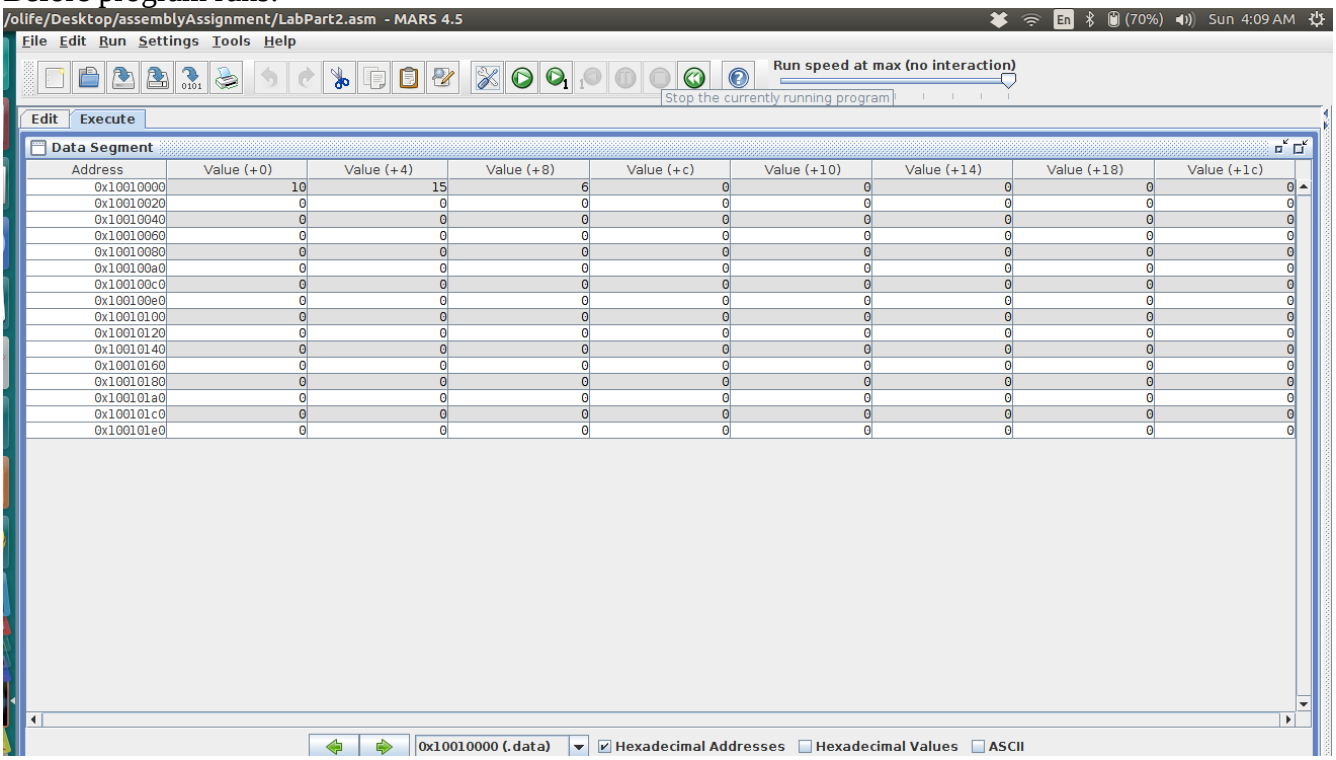

| Name | Number | Value |
|---|---|---|
| $zero | 0 | 0 |
| $at | 1 | 0 |
| $v0 | 2 | 0 |
| $v1 | 3 | 0 |
| $a0 | 4 | 0 |
| $a1 | 5 | 0 |
| $a2 | 6 | 0 |
| $a3 | 7 | 0 |
| $t0 | 8 | 0 |
| $t1 | 9 | 0 |
| $t2 | 10 | 0 |
| $t3 | 11 | 0 |
| $t4 | 12 | 0 |
| $t5 | 13 | 0 |
| $t6 | 14 | 0 |
| $t7 | 15 | 0 |
| $s0 | 16 | 0 |
| $s1 | 17 | 0 |
| $s2 | 18 | 0 |
| $s3 | 19 | 0 |
| $s4 | 20 | 0 |
| $s5 | 21 | 0 |
| $s6 | 22 | 0 |
| $s7 | 23 | 0 |
| $t8 | 24 | 0 |
| $t9 | 25 | 0 |
| $k0 | 26 | 0 |
| $k1 | 27 | 0 |
| $gp | 28 | 268468224 |
| $sp | 29 | 2147479548 |
| $fp | 30 | 0 |
| $ra | 31 | 0 |
| pc | | 4194304 |
| hi | | 0 |
| lo | | 0 |

After program finishes:

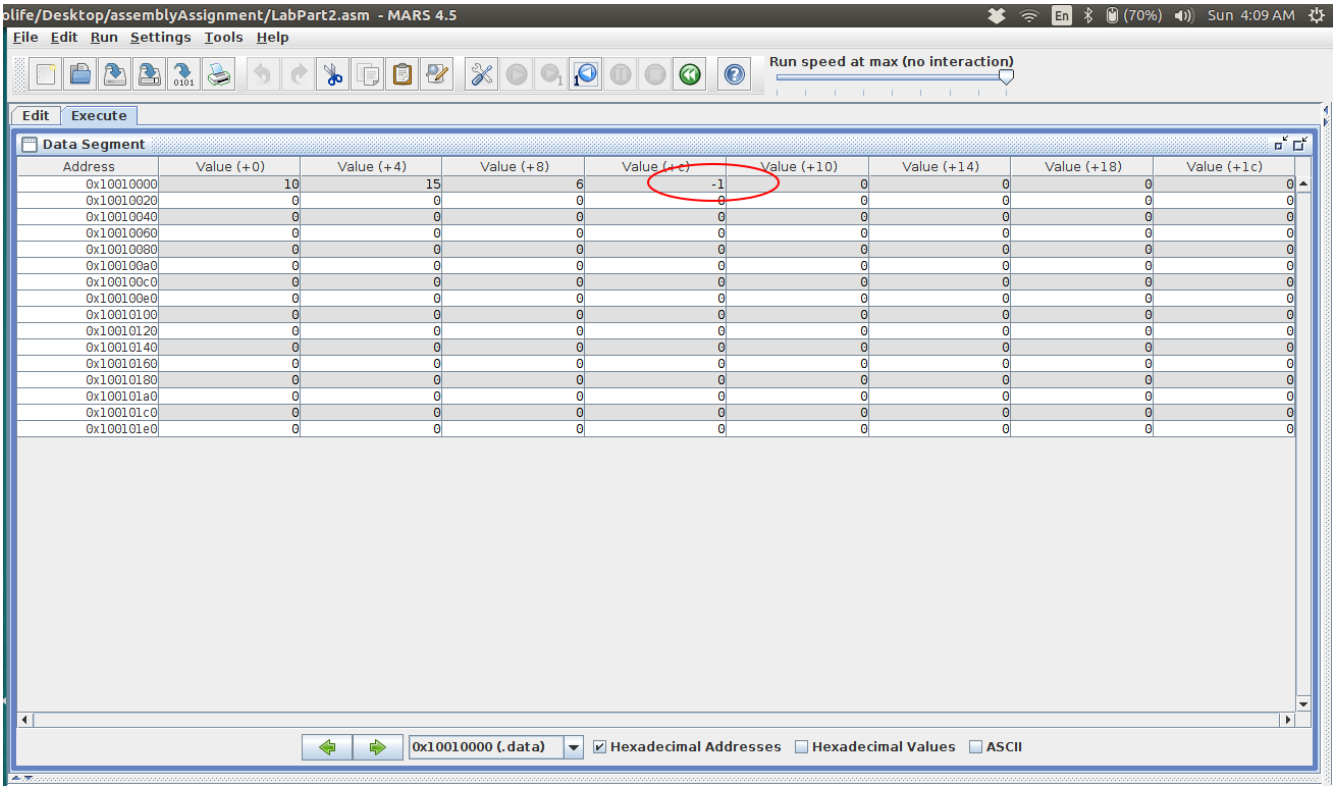



| Name | Number | Value |
|---|---|---|
| $zero | 0 | 0 |
| $at | 1 | 268500992 |
| $v0 | 2 | 10 |
| $v1 | 3 | 0 |
| $a0 | 4 | -1 |
| $a1 | 5 | 0 |
| $a2 | 6 | 0 |
| $a3 | 7 | 0 |
| $t0 | 8 | 10 |
| $t1 | 9 | 15 |
| $t2 | 10 | 6 |
| $t3 | 11 | 7 |
| $t4 | 12 | 1 |
| $t5 | 13 | -1 |
| $t6 | 14 | 0 |
| $t7 | 15 | 0 |
| $s0 | 16 | 0 |
| $s1 | 17 | 0 |
| $s2 | 18 | 0 |
| $s3 | 19 | 0 |
| $s4 | 20 | 0 |
| $s5 | 21 | 0 |
| $s6 | 22 | 0 |
| $s7 | 23 | 0 |
| $t8 | 24 | 0 |
| $t9 | 25 | 0 |
| $k0 | 26 | 0 |
| $k1 | 27 | 0 |
| $gp | 28 | 268468224 |
| $sp | 29 | 2147479548 |
| $fp | 30 | 0 |
| $ra | 31 | 0 |
| pc | | 4194528 |
| hi | | 0 |
| lo | | 0 |

4. Two screenshots of the MIPS memory panel (data tab):
Before program runs:




After program finishes:

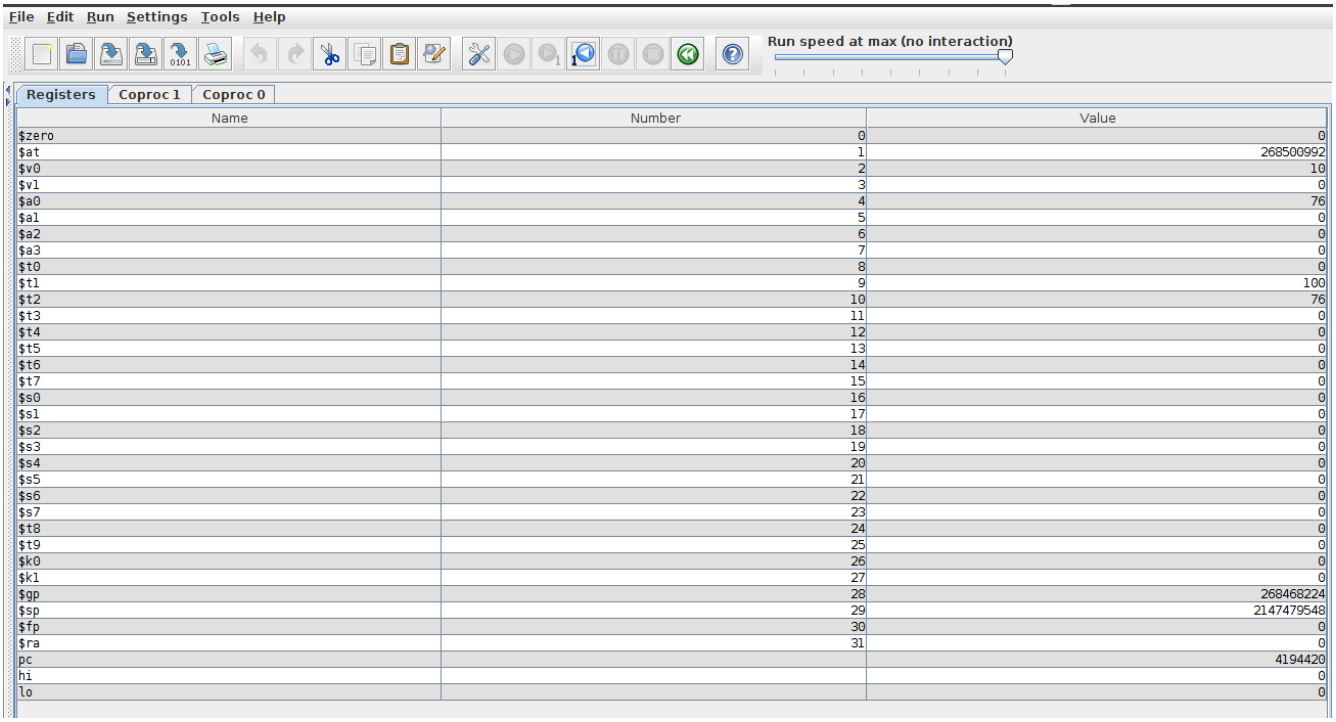


#LabPart3.asm

```
#################################################################
#                                               #
#               DTAT SEGMENT                    #
#                                               #
#################################################################
.data

        Z: .word 4              # int Z = 4;
        i: .word 0              # int i = 0;

#################################################################
#                                               #
#               TEXT SEGMENT                    #
#             MAIN CODE START NOW                       #
#                                               #
#################################################################
.text

main:

        lw $t2, Z                       # load word $t2 = Z;
#################################################################
#                                               #
#       for(i=0; i<=21; i=i+3) {Z++;}           #
#                                               #
#################################################################

        lw $t0, i                       # load word $t0 = i = 0;
        li $t1, 21                      # $t1 = 21

forLoop:

        bgt $t0, $t1, exitForLoop           # if (i>21) = ($t0 > $t1) then exitForLoop
        addiu $t2, $t2, 1               # Z++  =  $t2 = $t2 + 1
        addiu $t0, $t0, 3               # i++  =  $t0 = $t0 + 1

        j forLoop                       # unConditional jump to forLoop

exitForLoop:

#################################################################
#                                               #
#       do { Z++; } while (Z<100);              #
#                                               #
#################################################################
```

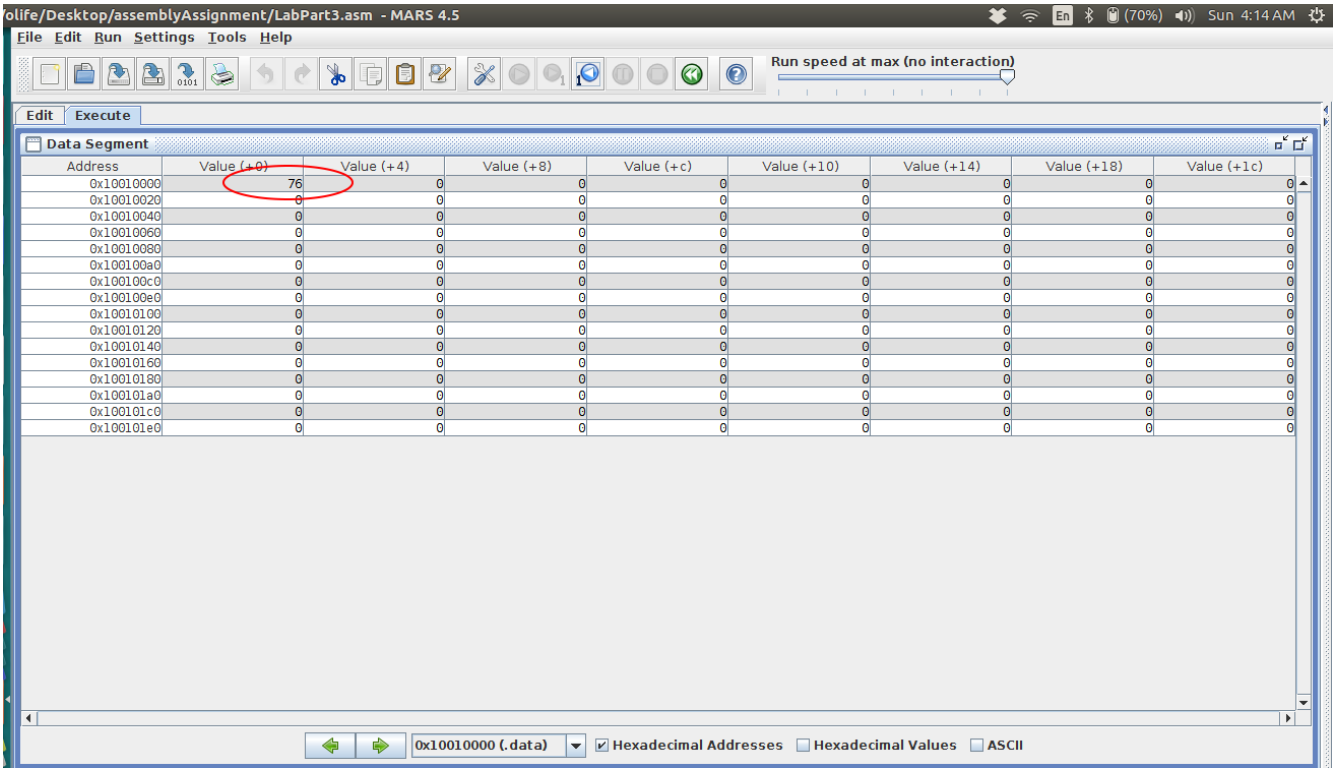
```
        li $t1, 100                     # $t1 = 100

doWhileLoop:

        addiu $t2, $t2, 1               # Z++  $t2 = $t2 + 1
        blt $t2, $t1, doWhileLoop           # if (Z<100) = ( $t2 < $t1 ) then jump to doWhileLoop

#############################################################
#                                       #
#       while(i > 0) { Z--;                     #
#                           i--;}                           #
#                                       #
#############################################################

whileLoop:

        blez $t0, exitWhileLoop             # if (i<=0) = ($t0 <= 0) then jump to  exitWhileLoop
        addiu $t0, $t0, -1              # i--  = $t0 = $t0 + (-1)
        addiu $t2, $t2, -1              # Z--  = $t2 = $t2 + (-1)

        j whileLoop                     # unConditional jump whileLoop


exitWhileLoop:

        sw $t2, Z                       # store value from $t2 to Z
        sw $t0, i                       # store value from $t0 to i

################## print result ############################

print:

        lw $t2, Z                       # load word from Z to $t2
        move $a0, $t2                       # move $a0 = $t2
        li $v0,1                        # print integer
        syscall

#########################################################
#                                       #
#             EXIT FROM PROGRAM                   #
#                                       #
#########################################################

exit:

        li $v0, 10                      # exit
        syscall
```

5. One screen shots of the MIPS register panel:
After program finishes:




| Name | Number | Value |
|---|---|---|
| $zero | 0 | 0 |
| $at | 1 | 268500992 |
| $v0 | 2 | 10 |
| $v1 | 3 | 0 |
| $a0 | 4 | 76 |
| $a1 | 5 | 0 |
| $a2 | 6 | 0 |
| $a3 | 7 | 0 |
| $t0 | 8 | 0 |
| $t1 | 9 | 100 |
| $t2 | 10 | 76 |
| $t3 | 11 | 0 |
| $t4 | 12 | 0 |
| $t5 | 13 | 0 |
| $t6 | 14 | 0 |
| $t7 | 15 | 0 |
| $s0 | 16 | 0 |
| $s1 | 17 | 0 |
| $s2 | 18 | 0 |
| $s3 | 19 | 0 |
| $s4 | 20 | 0 |
| $s5 | 21 | 0 |
| $s6 | 22 | 0 |
| $s7 | 23 | 0 |
| $t8 | 24 | 0 |
| $t9 | 25 | 0 |
| $k0 | 26 | 0 |
| $k1 | 27 | 0 |
| $gp | 28 | 268468224 |
| $sp | 29 | 2147479548 |
| $fp | 30 | 0 |
| $ra | 31 | 0 |
| pc | | 4194420 |
| hi | | 0 |
| lo | | 0 |

6. One screenshot of the MIPS memory panel (data tab):
After program finishes:




| Address | Value (+0) | Value (+4) | Value (+8) | Value (+c) | Value (+10) | Value (+14) | Value (+18) | Value (+1c) |
|---|---|---|---|---|---|---|---|---|
| 0x10010000 | 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010040 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010060 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010080 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100100a0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100100c0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100100e0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100101a0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100101c0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100101e0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

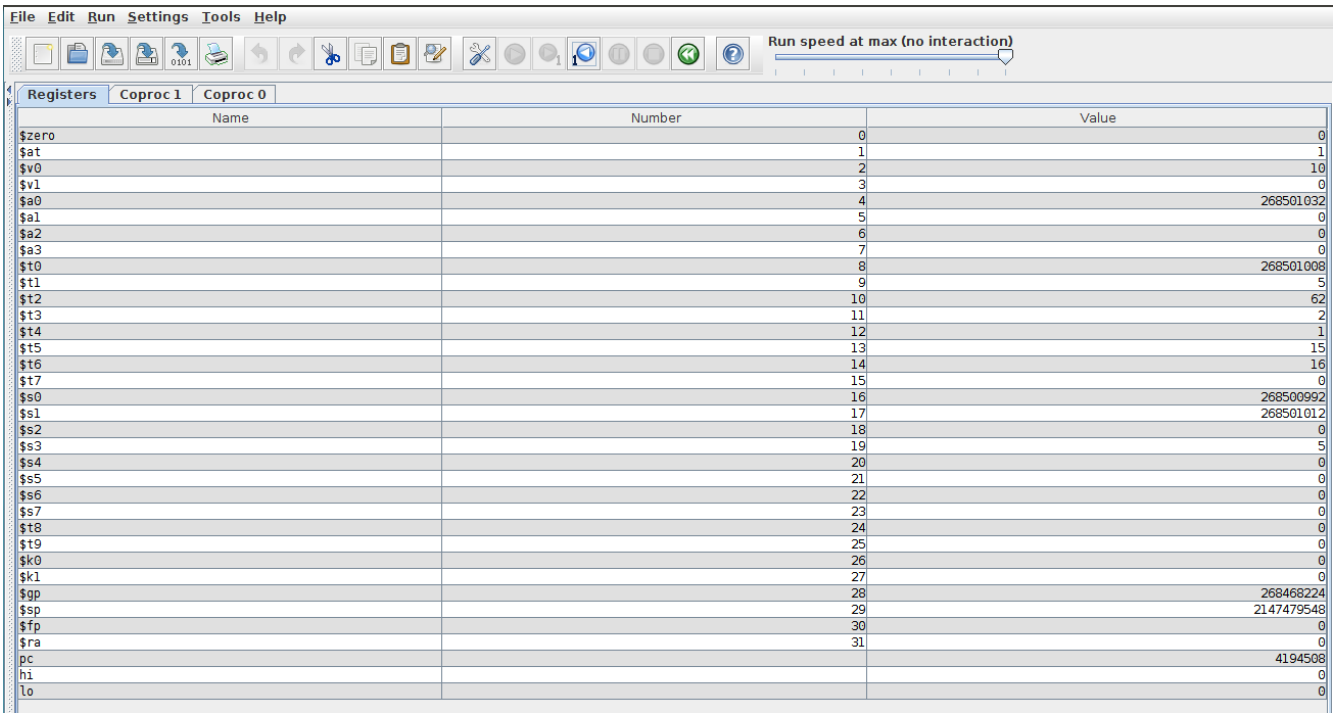
#LabPart4.asm

```
#################################################################
#                                       #
#               DTAT SEGMENT                        #
#                                       #
#################################################################

.data

        A: .word 0:5                    # declear an array of size 5
        B: .word 1, 2, 4, 8, 16         # initialize an array B
        newLine: .asciiz "\n"           # newLine string

#################################################################
#                                       #
#               TEXT SEGMENT                        #
#             MAIN CODE START NOW                     #
#                                       #
#################################################################

.text

main:

        la $s0, A                       # load the address of array A
        la $s1, B                       # load the address of array B

        move $t0, $s0                   # $t0 = $s0 move the addess of array A
        move $t1, $s1                   # $t1 = $s1 move the addess of array B

#################################################################
#                                       #
#       for(i=0; i<5; i++) {                    #
#                               A[i] = B[i] - 1;                #
#                       }                                               #
#################################################################


        li $t2, 0                       # i = $t2 = 0
        li $s3, 5                       # $s3 = 5

forLoop:


        lw $t4, 0($t1)                  # load the value of B[i] to $t4 ( $t4 = B[$t1] )

        addiu $t5, $t4, -1              # B[i]-1 = ($t5 = $t4-1)
```

```
        sw $t5, 0($t0)                  # store the value of $t5 to A[i] = B[i]-1; ( A[$t0] = $t5 )

        addiu $t2, $t2, 1               # i++; increment i as $t2 = $t2 + 1

        bge $t2, $s3, exitLoop          # if (i>5) = ($t2>$s3) then jump to exitLoop

        sll $t6, $t2, 2                 # $t6 = $t2 << 2 . multiply the value of $t2 with 4

        addu $t0, $s0, $t6              # $t0 = $s0 + $t6 increment the position of array A

        addu $t1, $s1, $t6              # $t1 = $s1 + $t6 increment the position of array B

        j forLoop                       # unconditional jump to fooLoop


exitLoop:

#################################################################
#                 i--;                                          #
#################################################################

        addiu $t2, $t2, -1              # i--; = ($t2 = $t2 -1) decrement the position of the array
        move $t0, $s0                   # move the addess of array A $t0 = $s0
        move $t1, $s1                   # move the addess of array B $t1 = $s1

#################################################################
#                                       #
#         while(i >= 0) {                       #
#                                 A[i]=(A[i]+B[i]) * 2;               #
#                             i--;}                                           #
#################################################################


whileLoop:

        sll $t4, $t2, 2                 # $t4 = $t2 << 2 . multiply the value of $t2 with 4
        addu $t0, $s0, $t4              # $t0 = $s0 + $t4
        addu $t1, $s1, $t4              # $t1 = $s1 + $t4

        lw $t3, 0($t0)                  # load the value of A[i] to $t3 ($t3 = A[$t0])
        lw $t4, 0($t1)                  # load the value of B[i] to $t4 ($t4 = B[$t1])

        addu $t3, $t3, $t4              # A[i]+B[i] = ($t3 = $t3 + $t4)

        sll $t3, $t3, 1                 # (A[i]+B[i])*2;  = ($t3 = $t3 < 1)  multiply the value of $t3 with 2

        sw $t3, 0($t0)                  # A[i]=(A[i]+B[i]) * 2; store the value of $t3 to A[i] (A[$t0] = $t3)
```

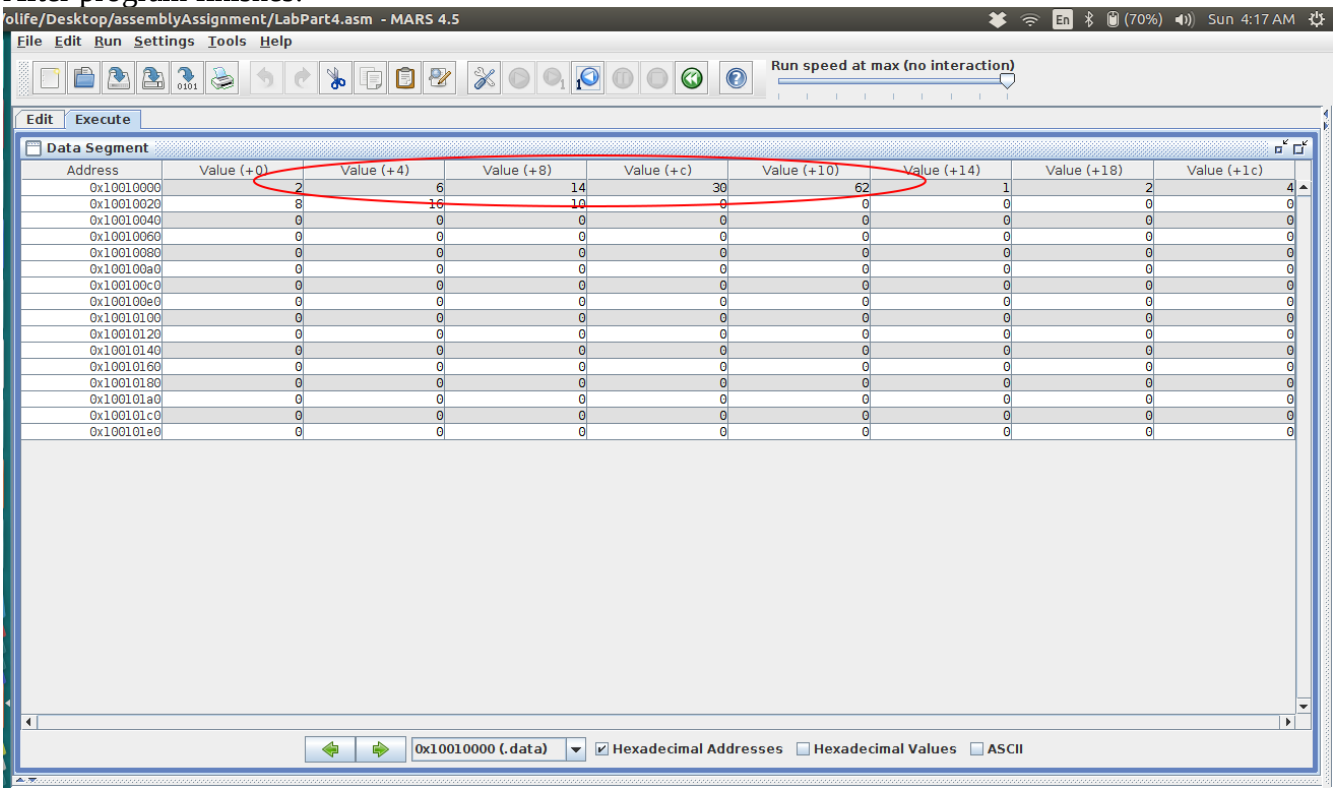
```
        addiu $t2, $t2, -1              # i--; decrement the index of the array ($t2 = $t2 -1)
        bltz $t2, exitWhileLoop         # if (i<0) = ( $t2< 0 ) then go to exitWhileLoop


        j whileLoop                     # unconditionla jump to whileLoop


exitWhileLoop:


################    print the Array A    ##################


print:

        la $t0, A                       # load the address of A to $t0
        li $t1, 0                       # i=0; load $t0 = 0


printLoop:

        lw $t2, 0($t0)              # A[i] load the value of A[$t0] to $t2
        move $a0, $t2               # move the value $t2 to $a0
        li $v0, 1                   # print the value of $a0
        syscall

        la $a0, newLine             # load the address of newLine
        li $v0, 4                   # print the new line
        syscall

        addi $t1, $t1, 1            # i++; ($t1 = $t1 + 1) increment the value of $t1
        bgt $t1, 4, exitPrintLoop   # if (i>4) = ($t1 > 4) then jump ot exitPrintLoop
        addi $t0, $t0, 4            # $t0 = $t0 + 4 increase the array position


        j printLoop                 # unconditional jump to printLoop

exitPrintLoop:

#############################################################
#                                   #
#           EXIT FROM PROGRAM               #
#                                   #
#############################################################

exit:

        li $v0, 10                      # exit
        syscall
```

7. One screenshot of the MIPS register panel :
After program finishes:




| Name | Number | Value |
|---|---|---|
| $zero | 0 | 0 |
| $at | 1 | 1 |
| $v0 | 2 | 10 |
| $v1 | 3 | 0 |
| $a0 | 4 | 268501032 |
| $a1 | 5 | 0 |
| $a2 | 6 | 0 |
| $a3 | 7 | 0 |
| $t0 | 8 | 268501008 |
| $t1 | 9 | 5 |
| $t2 | 10 | 62 |
| $t3 | 11 | 2 |
| $t4 | 12 | 1 |
| $t5 | 13 | 15 |
| $t6 | 14 | 16 |
| $t7 | 15 | 0 |
| $s0 | 16 | 268500992 |
| $s1 | 17 | 268501012 |
| $s2 | 18 | 0 |
| $s3 | 19 | 5 |
| $s4 | 20 | 0 |
| $s5 | 21 | 0 |
| $s6 | 22 | 0 |
| $s7 | 23 | 0 |
| $t8 | 24 | 0 |
| $t9 | 25 | 0 |
| $k0 | 26 | 0 |
| $k1 | 27 | 0 |
| $gp | 28 | 268468224 |
| $sp | 29 | 2147479548 |
| $fp | 30 | 0 |
| $ra | 31 | 0 |
| pc | | 4194508 |
| hi | | 0 |
| lo | | 0 |

8. one screenshot of the MIPS memory panel (data tab) :
After program finishes:




| Address | Value (+0) | Value (+4) | Value (+8) | Value (+c) | Value (+10) | Value (+14) | Value (+18) | Value (+1c) |
|---|---|---|---|---|---|---|---|---|
| 0x10010000 | 2 | 6 | 14 | 30 | 62 | 1 | 2 | 4 |
| 0x10010020 | 8 | 16 | 10 | 0 | 0 | 0 | 0 | 0 |
| 0x10010040 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010060 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010080 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100100a0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100100c0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100100e0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x10010180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100101a0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100101c0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100101e0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

#LabPart5.asm

```
#################################################################
#                                               #
#               DTAT SEGMENT                        #
#                                               #
#################################################################

.data

i: .word 0                                  # int i=0;
inputString: .space 256                         # string size 256
hexString: .space 20
ansHexString: .space 20
addressOfM: .word 0                             # address of 'm' = char *result = NULL;
letter: .byte 'm'                           # letter = 'm'
dialog1: .asciiz "First match at address : "        # message1
dialog2: .asciiz "No match found.\n"                # message2
newline: .asciiz "\n\nHexadecimal string: "         # newLine

#################################################################
#                                               #
#                TEXT SEGMENT                       #
#              MAIN CODE START NOW                      #
#                                               #
#################################################################

.text
main:

############   take input from user     ######################

        la $a0, inputString                     # load the address of inputString
        li $a1, 256                         # the size of the input string is 256
        li $v0, 8                           # take input from user
        syscall


        move $s0,$a0                        # move the address of inputString to $s0
        move $t5,$s0                        # move the address of inputString to $t5
        lw $t0, i                           # load the value of the word from i to $t0
        lb $t1, letter                      # load the value of the byte from letter to $t1

while:

        lb $t2, 0($t5)                      # load the value of the byte from $t5 to $t2
        beq $t2, $zero, exitWhile               # if ($t2 == 0) then branch to exitWhile
        beq $t1, $t2, storeTheAddress               # if ($t1 == $t2 ) then branch to storeTheAddress
        addiu $t0, $t0, 1                   # i++; ($t0 = $t0 + 1)
```

```
        addu $t5, $s0, $t0                  # $t5 = $s0 + $t0

j while                                 # unconditional jump to while

##############   store the address of 'm'    ##############

storeTheAddress:

        move $t0, $t5                   # move the address store in $t5 to $t0
        sw $t0, addressOfM                  # store the address of 'm' in the inputString to
addressOfM
        lw $t0, addressOfM                  # load the address of 'm' from addressOfM

        la $a0, dialog1                 # load the address of dialog1
        li $v0, 4                       # print the string
        syscall

        move $a0, $t0                    # move the value of $t0 to $a0 to print
        li $v0, 1                       # print the integer value in $a0
        syscall

#############  conver the address of decimal to hexadecimal ########

        li $t1, 16                      # load imidiate value $t1 = 16
        li $t7, 0                       # load immediate $t7 = 0


loop:

        div $t0,$t1                      # divide $t0 / $t1
        mfhi $t2                        # move the reminder to $t2
        mflo $t3                        # move the quoitent to $t3

        beqz $t0, loopExit                  # if ($t0 == 0 ) then branch to loopExit
        move $t0, $t3                   # move value of $t3 to $t0
        bge $t2, 10, setChar                # if ($t2>=10) then branch to setChar
        addiu $t3, $t2, 48              # $t3 = $t2 + 48

        j initilize                     # unconditional jump to initilize the hexString

setChar:

        addiu $t3, $t2, 55              # $t3 = $t2 + 55

initilize:

        sb $t3, hexString($t7)              # store $t3 byte to hexString at ($t7) position
        addiu $t7, $t7, 1               # $t7 = $t7 + 1 increase the index
```

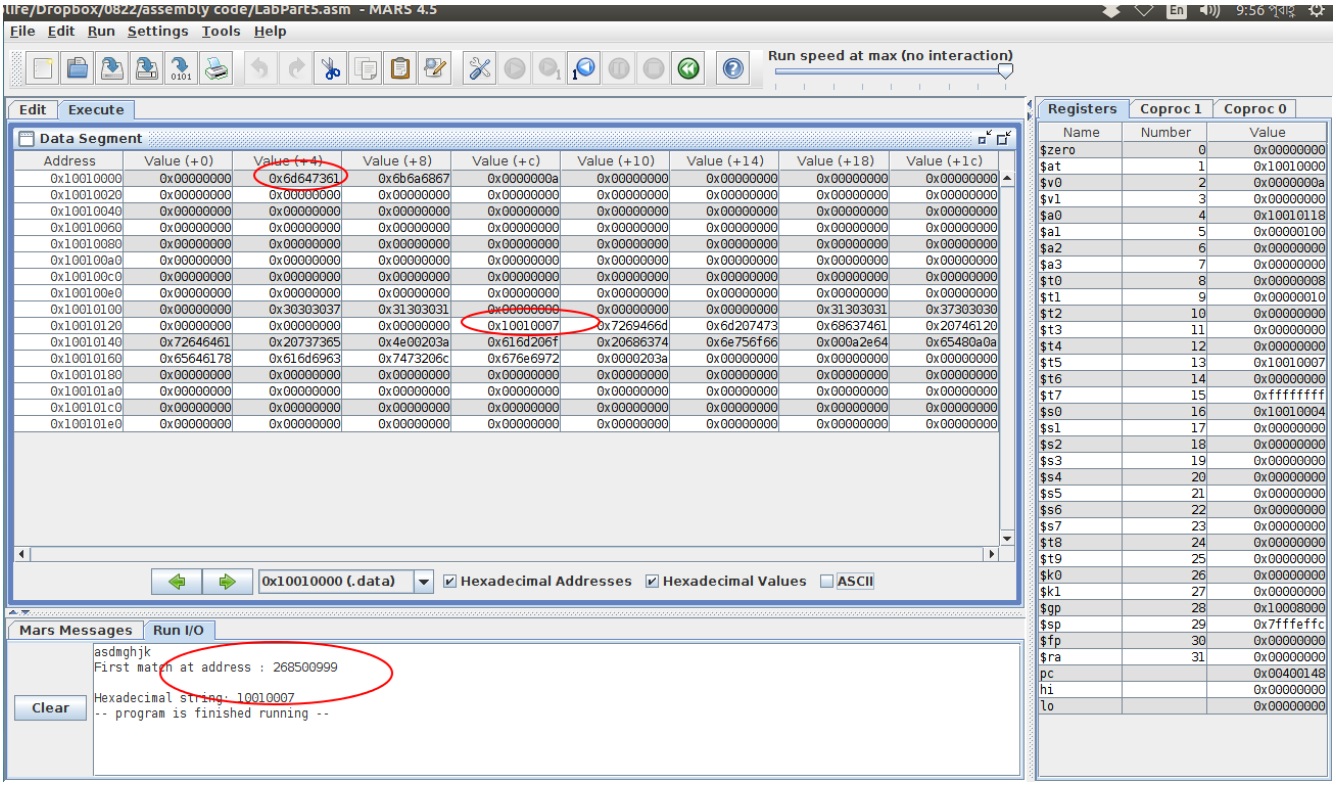
```
j loop                          # unconditional jump to loop

loopExit:

        li $t2, 0               # load immediate $t2 = 0
        sb $t2, hexString($t7)          # store $t3 byte to hexString at ($t7) position

        addiu $t7, $t7, -1          # $t7 = $t7 -1 decrement the index
        addiu $t0, $zero, 0          # set the value of $t0 = 0


reverseTheHexString:

        blt $t7, $zero, print          # if ($t7 < 0) then jump to print label
        lb $t2,hexString($t7)          # load byte from hexString to $t2
        sb $t2,ansHexString($t0)          # stroe byte from $t2 to   hexString
        addiu $t0, $t0, 1          # $t0 = $t0+1 increment tne index of ansHexString
        addiu $t7, $t7, -1          # $t7 = $t7 -1 decrement the index of hexString

j reverseTheHexString                  # unconditional jump to reverseTheHexString


print:

        li $t2, 0               # set the value of $t2 = 0
        sb $t2, ansHexString($t0)          # store $t2 byte to ansHexString of $t0 position

        la $a0, newline             # load the address of newLine
        li $v0, 4               # print the newLine string
        syscall

        la $a0, ansHexString          # load the address of ansHexString
        li $v0, 4               # print the ansHexString string
        syscall


j exit

exitWhile:

        la $a0, dialog2             # load the address of dialog2
        li $v0, 4               # print the string
        syscall


#########################################################
#                                       #
#           EXIT FROM PROGRAM                   #
```

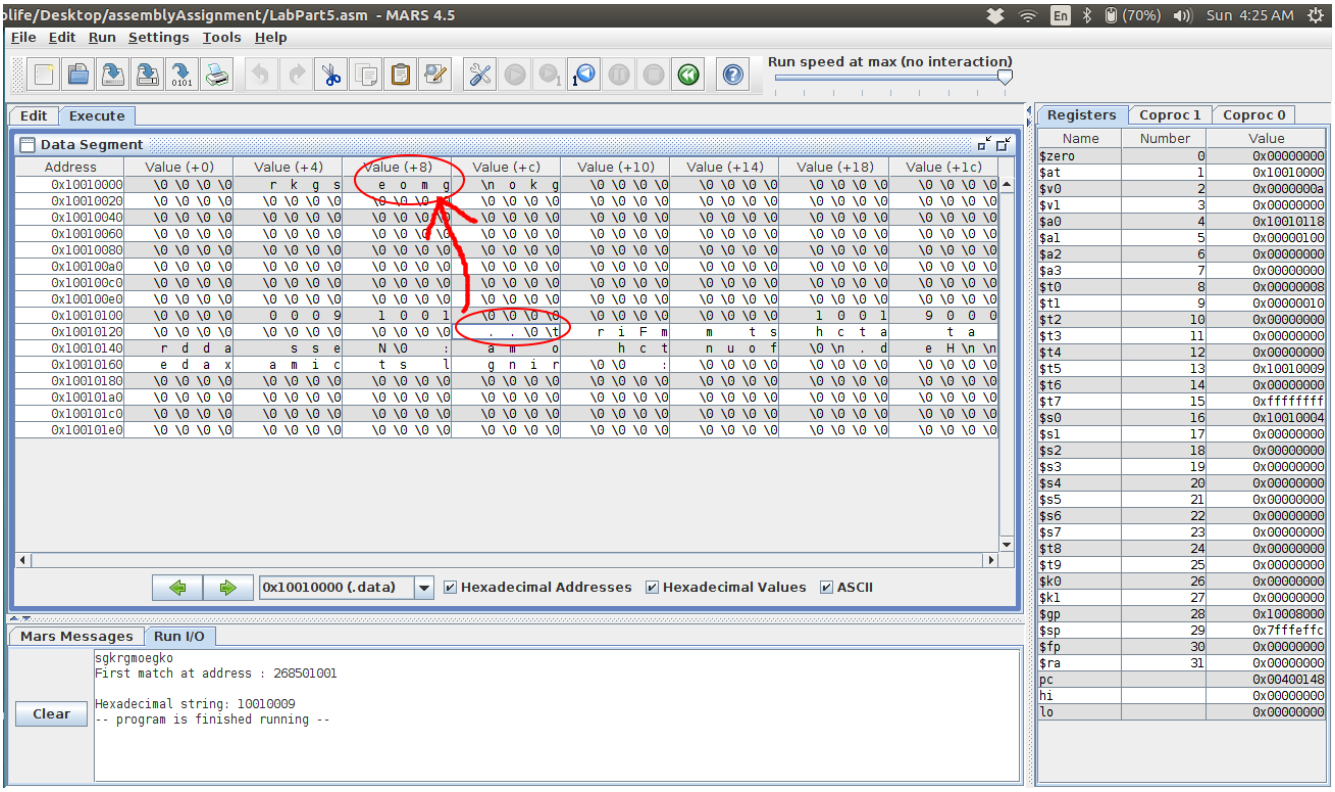
#  #
############################################################

exit:

```
    li $v0, 10                  # exit from program
    syscall
```

9. One screenshot of the MIPS memory panel (data tab) after your program finishes:






* Best part is we know about assembly language
* I don't think so;
* In future you must provide more exam and assignment.