Báo cáo thực hành KTMT tuần 5

Họ và tên: Đỗ Gia Huy

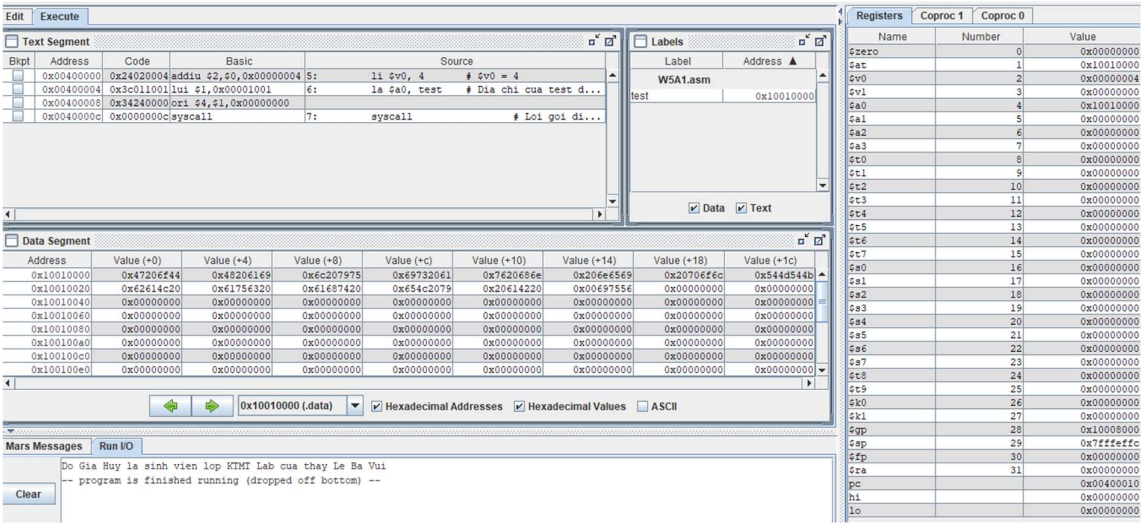
MSSV: 20215060

Assignment 1

Code:

```
#Laboratory Exercise 5, Assignment 1
.data
    test: .asciiz "Do Gia Huy la sinh vien lop KTMT Lab cua thay Le Ba Vui"
.text
    li    $v0, 4        # $v0 = 4
    la    $a0, test     # Dia chi cua test duoc ghi vao $a0
    syscall             # Loi goi dich vu he thong
```

Result:



⇨ **Kết quả trên đúng với lý thuyết**

Assignment 2

Code:

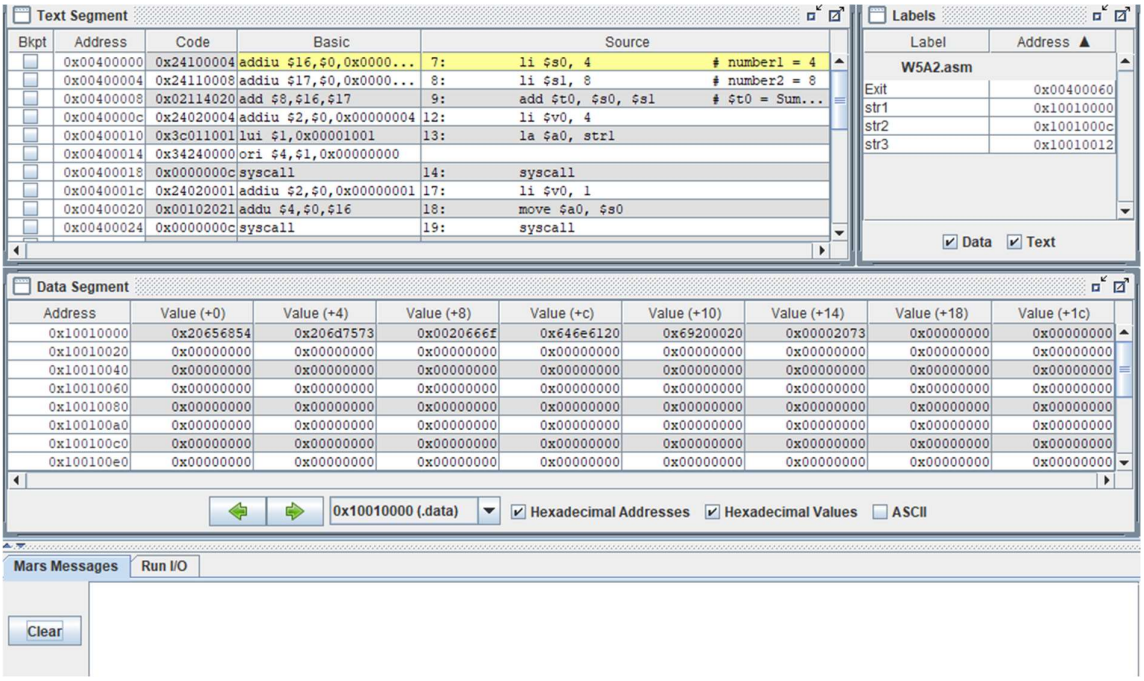
```
#Laboratory Exercise 5, Assignment 2
```

```
.data
        str1: .asciiz "The sum of "
        str2: .asciiz " and "
        str3: .asciiz " is "
.text
        li      $s0, 4              # number1 = 4
        li      $s1, 8              # number2 = 8
        add     $t0, $s0, $s1       # $t0 = Sum of 4 and 8

        # Print string "str1"
        li      $v0, 4
        la      $a0, str1
        syscall

        # Print $s0
        li      $v0, 1
        move $a0, $s0
        syscall

        # Print string "str2"
        li      $v0, 4
        la      $a0, str2
        syscall

        # Print $s1
        li      $v0, 1
        move $a0, $s1
        syscall
```

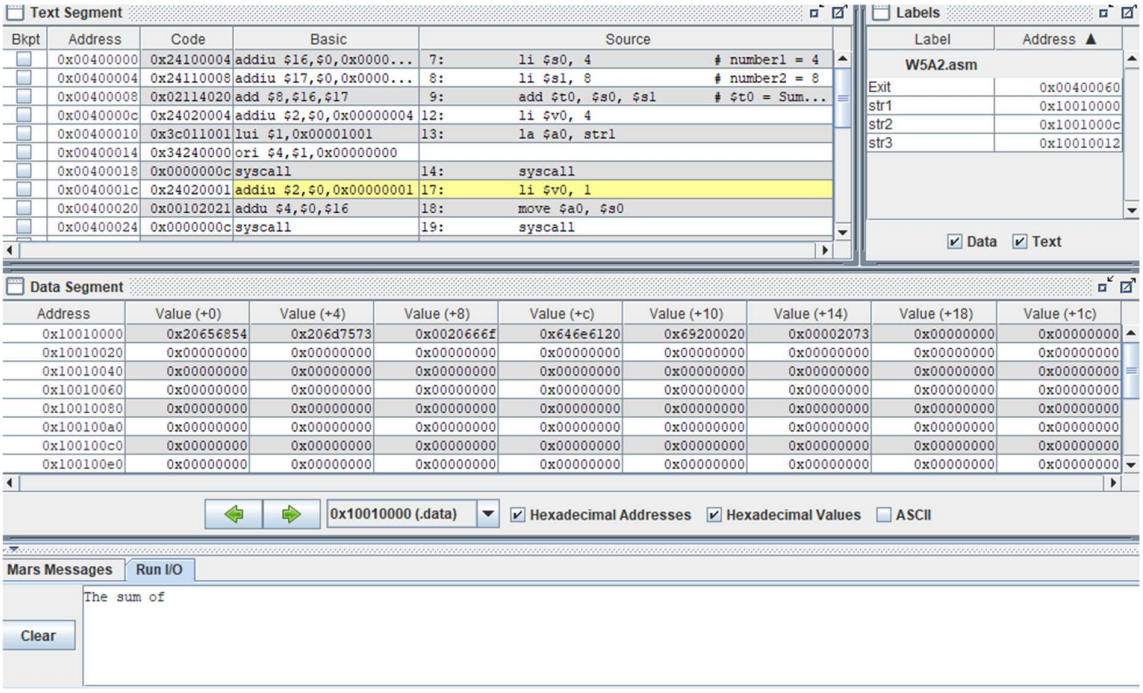
```
        # Print string "str3"
        li      $v0, 4
        la      $a0, str3
        syscall

        # Print $t0
        li      $v0, 1
        move $a0, $t0
        syscall

Exit:   li      $v0, 10
        syscall
```

Result:

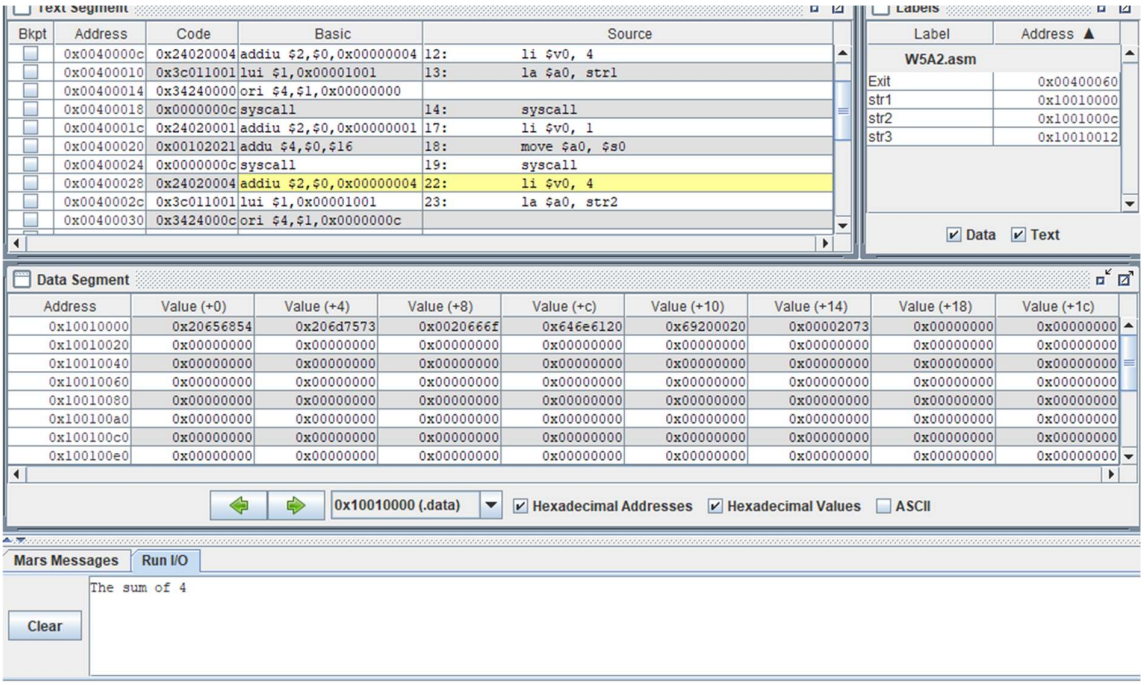
- Bắt đầu thực hiện chương trình



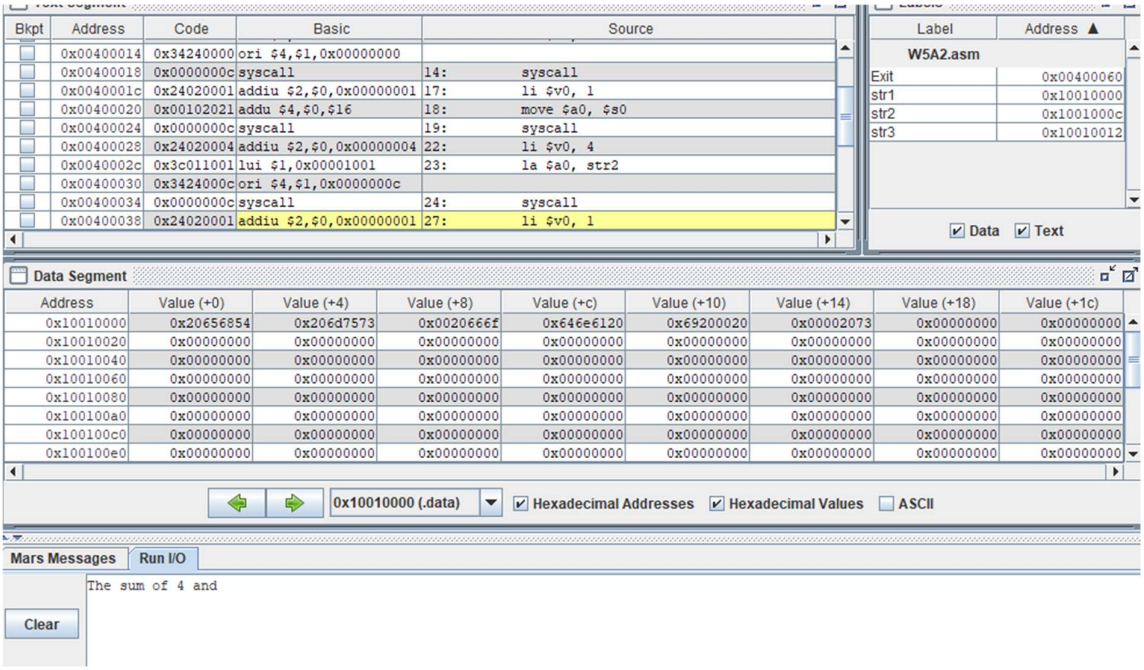
- In xâu “The sum of”



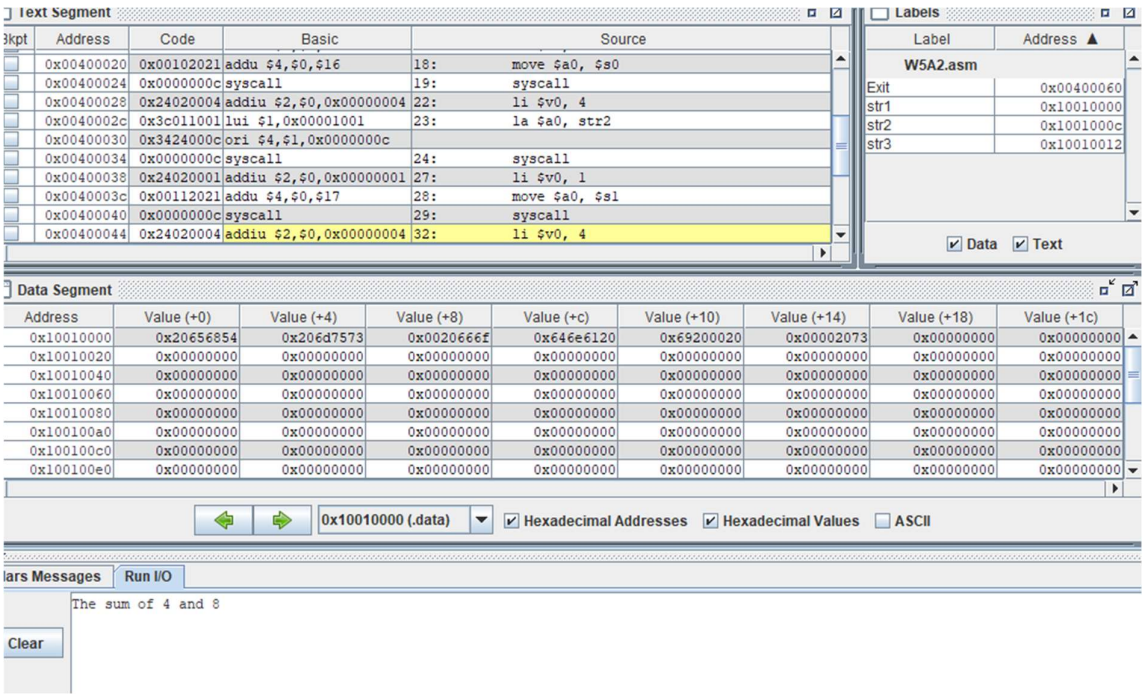
- In số 4



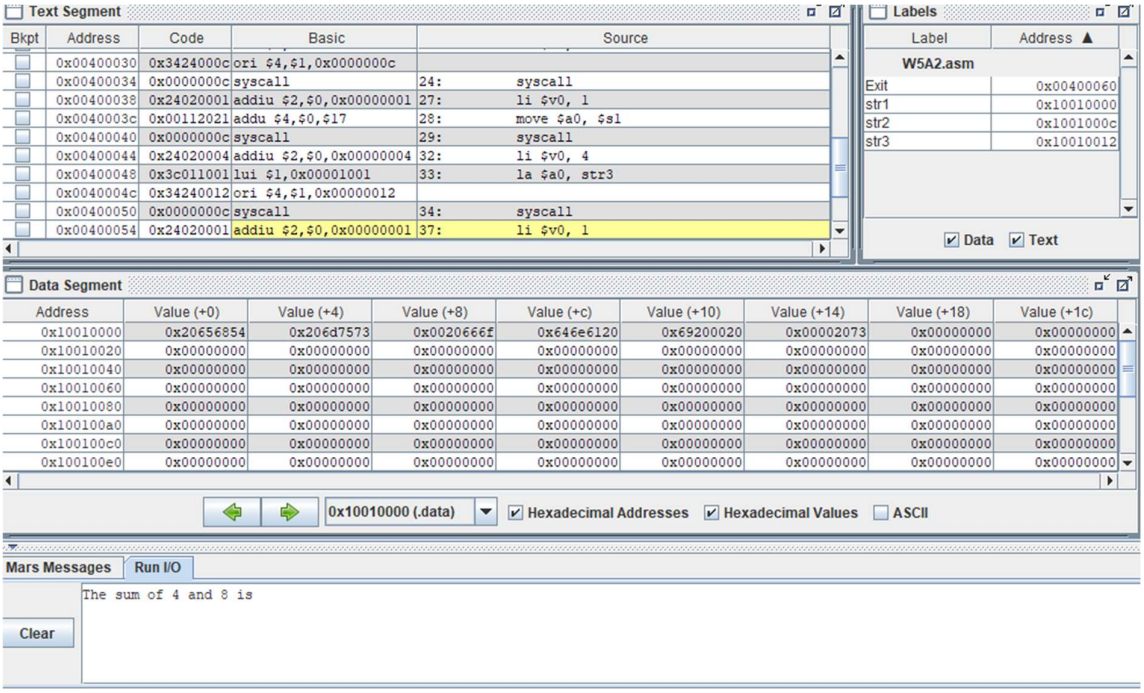
- In xâu “and”



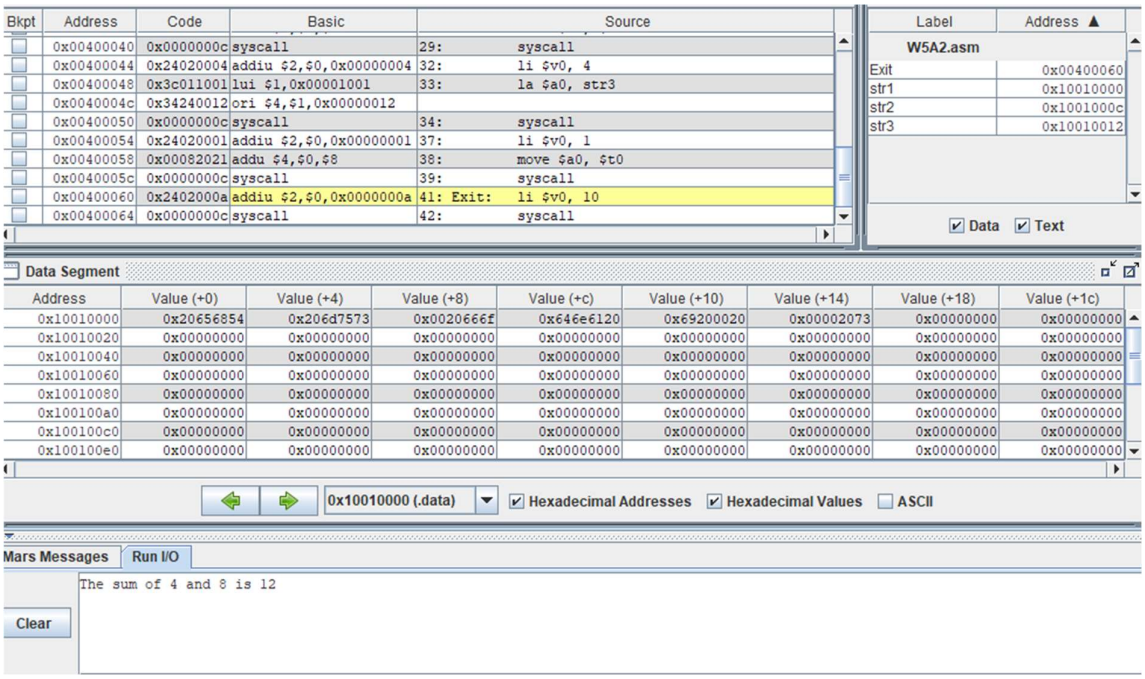
- In số 8



- In xâu “is”



- In kết quả ra màn hình, cụ thể $4 + 8 = 12$



⇨ **Kết quả trên đúng với lý thuyết**

Assignment 3

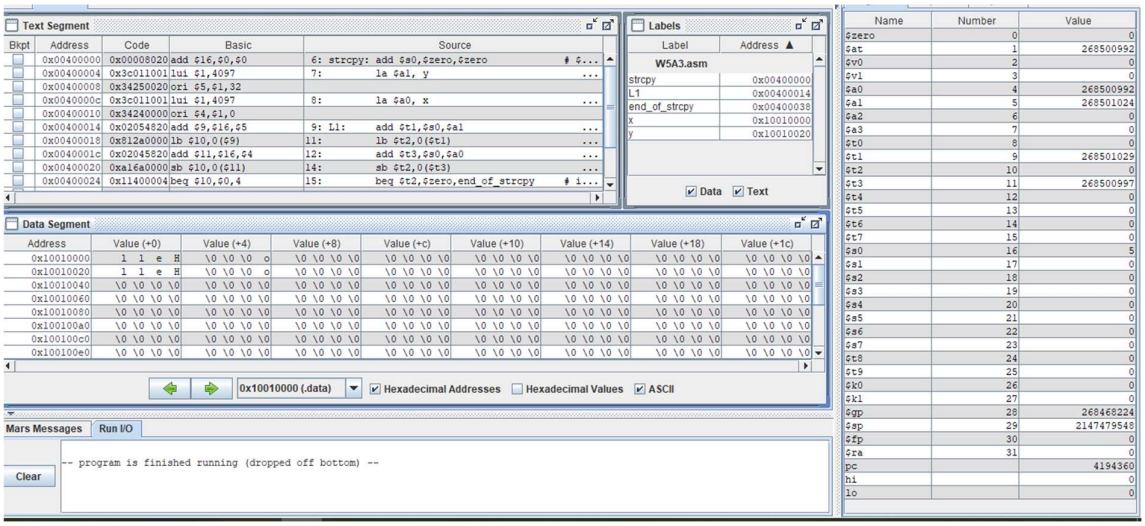
Code:

#Laboratory Exercise 5, Assignment 3

.data

```
        x: .space 32                    # destination string x, empty
        y: .asciiz "Hello"              # source string y
.text
strcpy:     add   $s0,$zero,$zero       # $s0 = i = 0
        la      $a1, y                  # Load address of y to $a1
        la      $a0, x                  # Load address of x to $a0
L1:     add     $t1,$s0,$a1             # $t1 = $s0 + $a1 = i + y[0]
        # = address of y[i]
        lb      $t2,0($t1)              # $t2 = value at $t1 = y[i]
        add     $t3,$s0,$a0             # $t3 = $s0 + $a0 = i + x[0]
        # = address of x[i]
        sb      $t2,0($t3)              # x[i]= $t2 = y[i]
        beq     $t2,$zero,end_of_strcpy # if y[i] == 0, exit
        nop
        addi    $s0,$s0,1               # $s0 = $s0 + 1 <-> i = i + 1
        j       L1                          # next character
        nop
end_of_strcpy:
```

Result:



⇨ **Kết quả trên đúng với lý thuyết**

Assignment 4

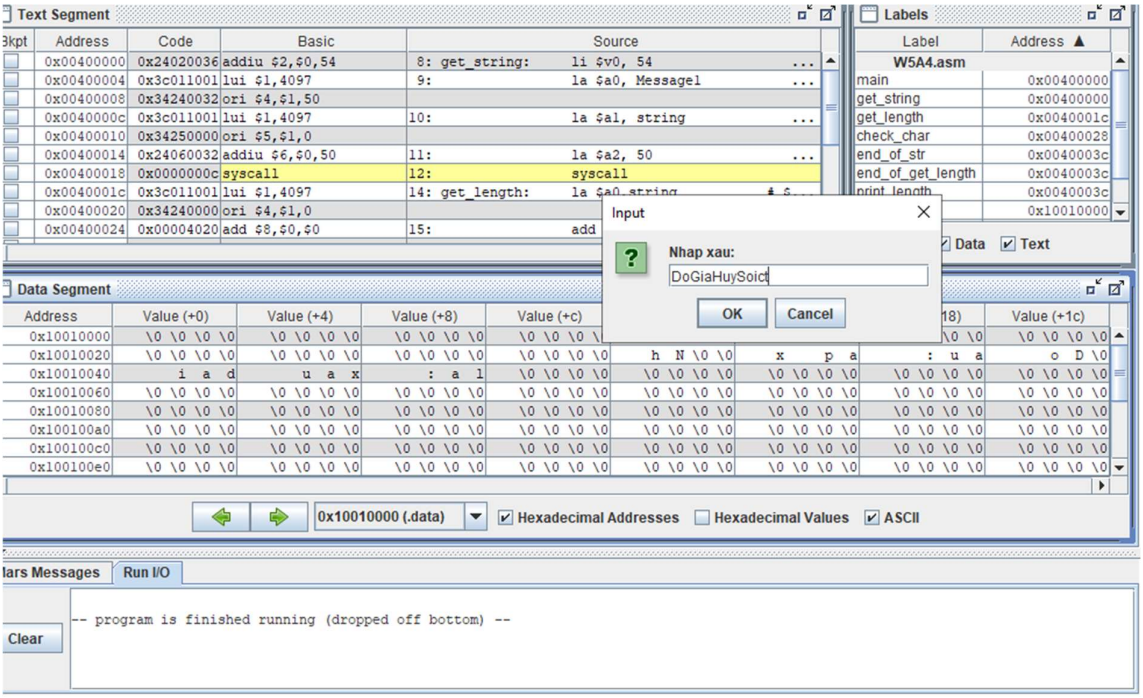
Code:

```
#Laboratory Exercise 5, Assignment 4
.data
        string: .space 50
        Message1: .asciiz "Nhap xau: "
        Message2: .asciiz "Do dai xau la: "
.text
main:
get_string:  li      $v0, 54             # Get a string from dialog
             la      $a0, Message1       # Load address of the Message1 to $a0
             la      $a1, string         # Load address of input buffer "string"
to $a1
             la      $a2, 50             # Maximum number of characters to
read = 50
             syscall

get_length:  la      $a0,string                 # $a0 = address(string[0])
             add     $t0,$zero,$zero            # $t0 = i = 0

check_char:  add     $t1,$a0,$t0  # $t1 = $a0 + $t0
             # = address(string[i])
             lb      $t2, 0($t1)                # $t2 = string[i]
             beq     $t2, $zero, end_of_str     # is null char?
             addi    $t0, $t0, 1                # $t0 = $t0 + 1 -> i = i + 1
             j       check_char
end_of_str:
end_of_get_length:
```

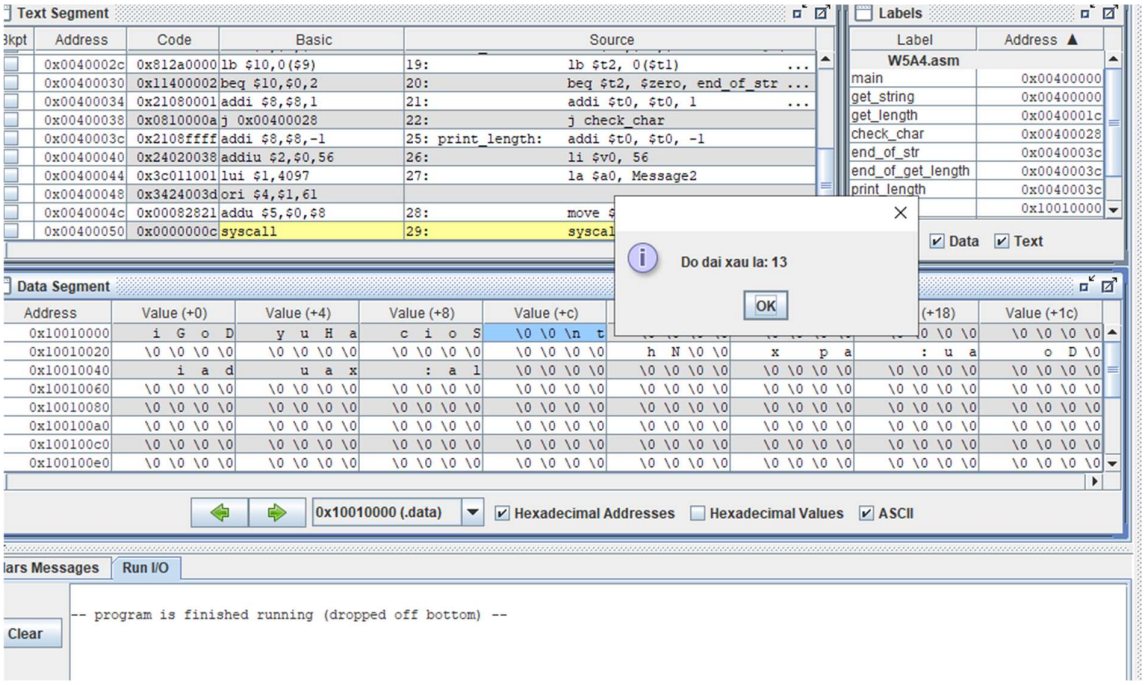
```
print_length:   addi $t0, $t0, -1
                li   $v0, 56
                la   $a0, Message2
                move $a1, $t0
                syscall
```

Result:

- Nhập xâu, giả sử nhập xâu “DoGiaHuySoict” :



- Trả về độ dài ký tự xâu:



⇨ **Nhận thấy xâu "DoGiaHuySoict" dài đúng 13 ký tự, ta có thể kết luận được rằng kết quả trên đúng với lý thuyết**

Assignment 5

Code:

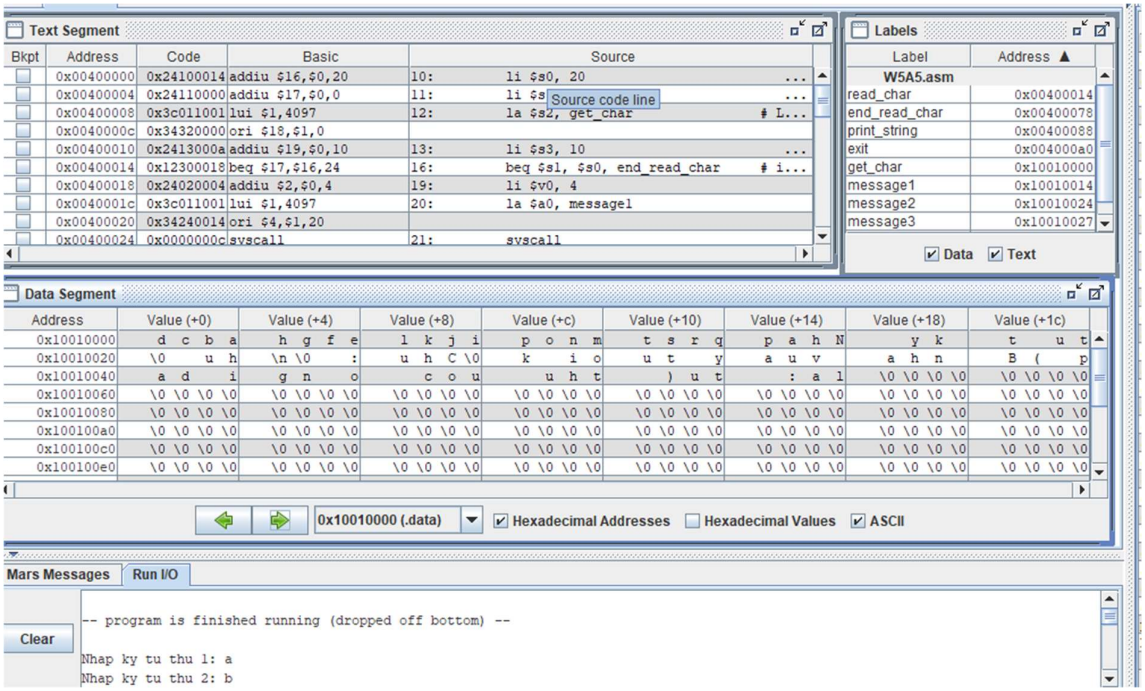
```
#Laboratory Exercise 5, Assignment 5
.data
    get_char: .space 20
    message1: .asciiz "Nhap ky tu thu "
    message2: .asciiz ": "
    message3: .asciiz "\n"
    message4: .asciiz "Chuoi ky tu vua nhap (Bi dao nguoc thu tu) la: "

.text
    li    $s0, 20              # N = 20
    li    $s1, 0               # i = 0
    la    $s2, get_char        # Load address of get_char[0]
```

```
        li      $s3, 10                 # Char \n in ASCII

read_char:
        beq     $s1, $s0, end_read_char # i = N branch to exit

        # Show message "Nhap ky tu thu i: "
        li      $v0, 4
        la      $a0, message1
        syscall

        addi    $t1, $s1, 1
        li      $v0, 1
        move $a0, $t1
        syscall

        li      $v0, 4
        la      $a0, message2
        syscall

        li      $v0, 12         # Read character
        syscall
        move $t0, $v0
        beq     $t0, $s3, end_read_char # Press "Enter" branch to exit

        li      $v0, 4
        la      $a0, message3
        syscall
```

```
        add     $s5, $s2, $s1  #$s5 = Address of get_char[i] = get_char[0] + i
        sb      $t0, 0($s5)    #Store character to get_char[i]
        addi    $s1, $s1, 1     # i++
        j       read_char
end_read_char:
        li      $v0, 4
        la      $a0, message4
        syscall
print_string:
        li      $v0, 11
        lb      $a0, 0($s5)
        syscall

        beq     $s5, $s2, exit
        addi    $s5, $s5, -1
        j       print_string
exit:
        li      $v0, 10
        syscall
```

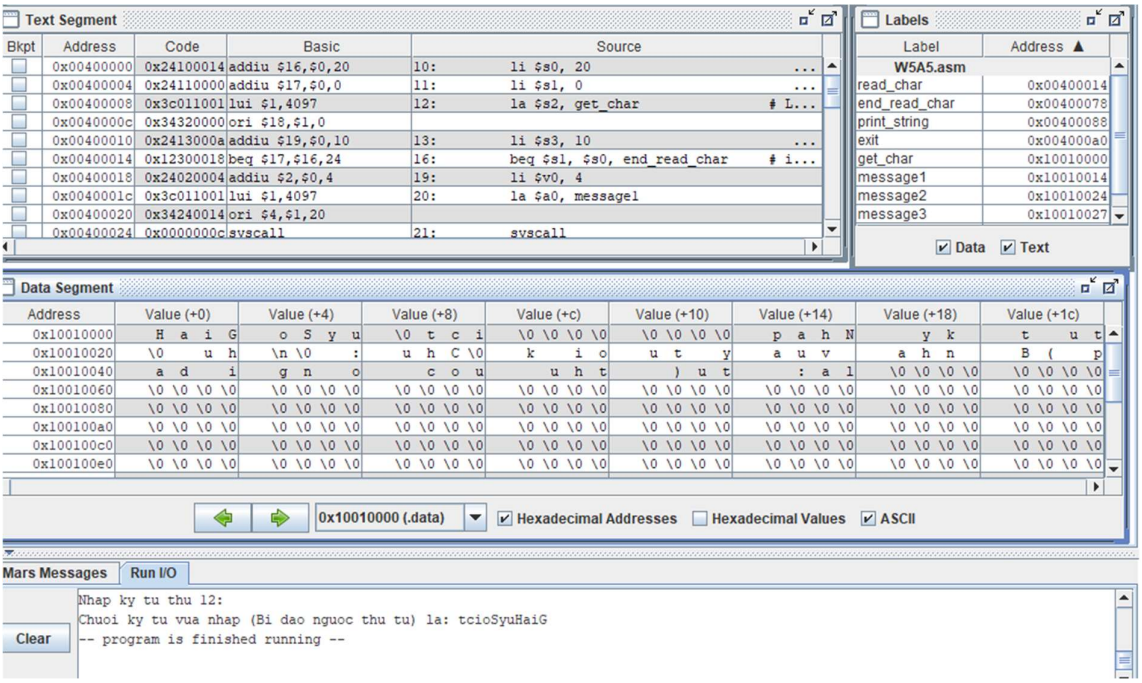
Result:

- Trường hợp nhập đủ 20 ký tự. Giả sử xâu ta nhập là “abcdefghijklmnopqrst” :




```
-- program is finished running (dropped off bottom) --

Nhap ky tu thu 1: a
Nhap ky tu thu 2: b
Nhap ky tu thu 3: c
Nhap ky tu thu 4: d
Nhap ky tu thu 5: e
Nhap ky tu thu 6: f
Nhap ky tu thu 7: g
Nhap ky tu thu 8: h
Nhap ky tu thu 9: i
Nhap ky tu thu 10: j
Nhap ky tu thu 11: k
Nhap ky tu thu 12: l
Nhap ky tu thu 13: m
Nhap ky tu thu 14: n
Nhap ky tu thu 15: o
Nhap ky tu thu 16: p
Nhap ky tu thu 17: q
Nhap ky tu thu 18: r
Nhap ky tu thu 19: s
Nhap ky tu thu 20: t
Chuoi ky tu vua nhap (Bi dao nguoc thu tu) la: tsrqponmlkjihgfedcba
-- program is finished running --
```

- Trường hợp không nhập đủ 20 ký tự, cụ thể là nhập “GiaHuySoict\n”:



Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x24100014	addiu $16,$0,20	10: li $s0, 20 ...
	0x00400004	0x24110000	addiu $17,$0,0	11: li $s1, 0 ...
	0x00400008	0x3c011001	lui $1,4097	12: la $s2, get_char # L...
	0x0040000c	0x34320000	ori $18,$1,0	
	0x00400010	0x2413000a	addiu $19,$0,10	13: li $s3, 10 ...
	0x00400014	0x12300018	beq $17,$16,24	16: beq $s1, $s0, end_read_char # i...
	0x00400018	0x24020004	addiu $2,$0,4	19: li $v0, 4
	0x0040001c	0x3c011001	lui $1,4097	20: la $a0, message1
	0x00400020	0x34240014	ori $4,$1,20	
	0x00400024	0x0000000c	syscall	21: syscall

Labels

Label	Address ▲
W5A5.asm	
read_char	0x00400014
end_read_char	0x00400078
print_string	0x00400088
exit	0x004000a0
get_char	0x10010000
message1	0x10010014
message2	0x10010024
message3	0x10010027

☑ Data ☑ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	H a i G	o S y u	\0 t c i	\0 \0 \0 \0	\0 \0 \0 \0	p a h N	y k	t u t
0x10010020	\0 u h	\n \0 :	u h C \0	k i o	u t y	a u v	a h n	B (p
0x10010040	a d i	g n o	c o u	u h t	) u t	: a l	\0 \0 \0 \0	\0 \0 \0 \0
0x10010060	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0
0x10010080	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0
0x100100a0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0
0x100100c0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0
0x100100e0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0	\0 \0 \0 \0

0x10010000 (.data) ☑ Hexadecimal Addresses ☐ Hexadecimal Values ☑ ASCII

Mars Messages | Run I/O

Clear

```
Nhap ky tu thu 12:
Chuoi ky tu vua nhap (Bi dao nguoc thu tu) la: tcioSyuHaiG
-- program is finished running --
```

```
Nhap ky tu thu 1: G
Nhap ky tu thu 2: i
Nhap ky tu thu 3: a
Nhap ky tu thu 4: H
Nhap ky tu thu 5: u
Nhap ky tu thu 6: y
Nhap ky tu thu 7: S
Nhap ky tu thu 8: o
Nhap ky tu thu 9: i
Nhap ky tu thu 10: c
Nhap ky tu thu 11: t
Nhap ky tu thu 12:
Chuoi ky tu vua nhap (Bi dao nguoc thu tu) la: tcioSyuHaiG
-- program is finished running --
```

⇨ **Kết quả trên đúng với lý thuyết**