Báo cáo Thực hành KTMT Tuần 5

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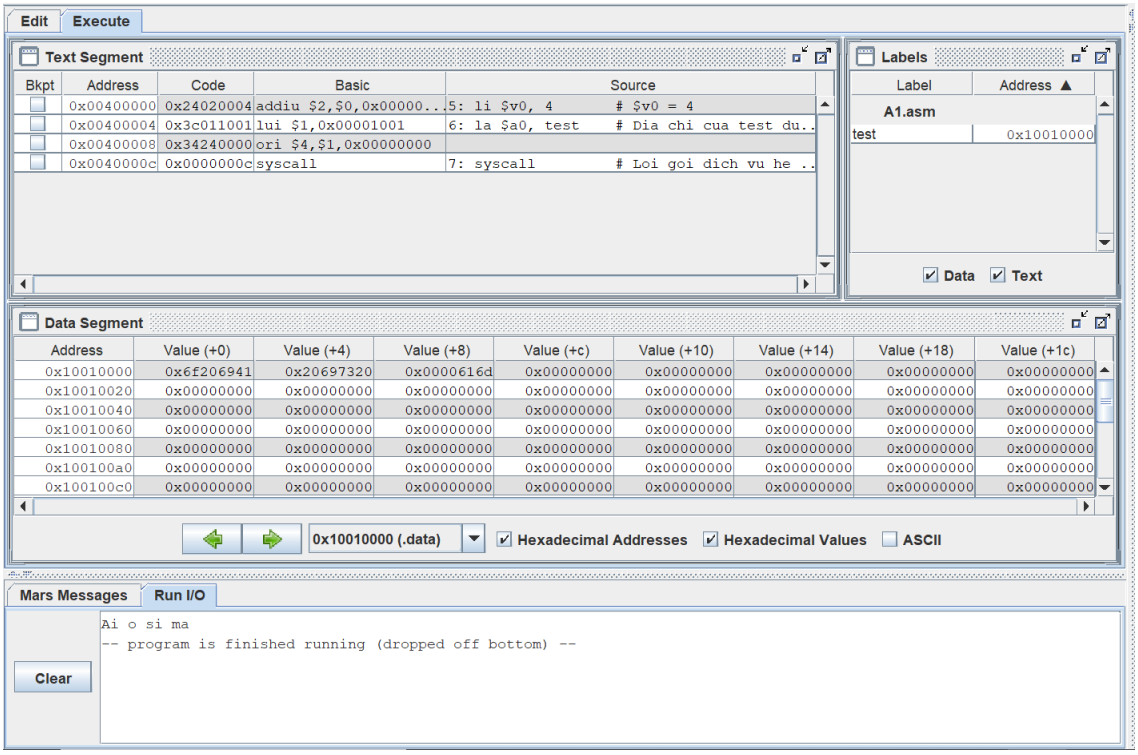
Assignment 1:

- Code:

```
#Laboratory Exercise 5, Assignment 1
.data
      test: .asciiz "Ai o si ma"
.text
      li $v0, 4                  # $v0 = 4
      la $a0, test               # Dia chi cua test duoc ghi vao $a0
      syscall                    # Loi goi dich vu he thong
```

- Kết quả chạy thử:



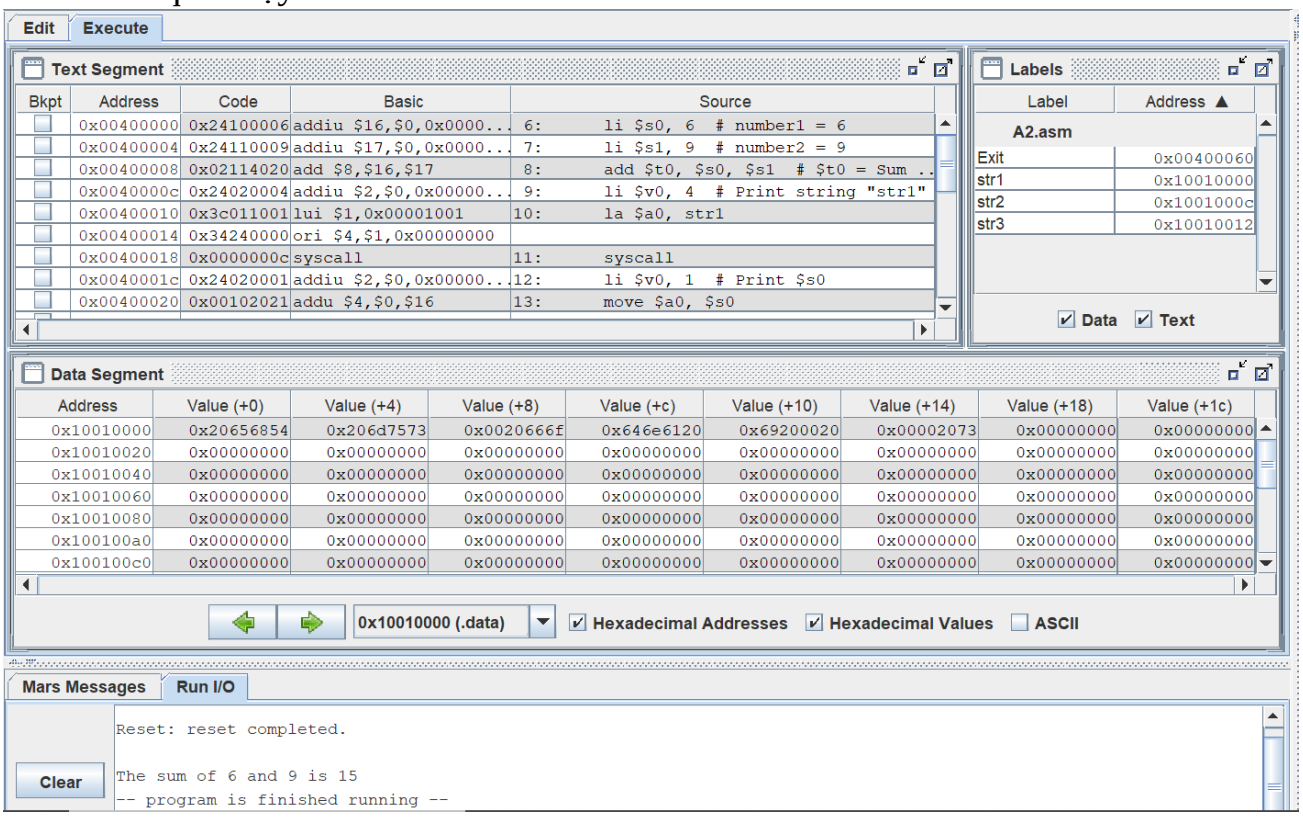
Assignment 2:

- Code:

```
.data
      str1: .asciiz "The sum of "
      str2: .asciiz " and "
      str3: .asciiz " is "
```

```
.text
        li $s0, 6                   # number1 = 6
        li $s1, 9                   # number2 = 9
        add $t0, $s0, $s1           # $t0 = Sum of 6 and 9
        li $v0, 4                   # Print string "str1"
        la $a0, str1
        syscall
        li $v0, 1                   # Print $s0
        move $a0, $s0
        syscall
        li $v0, 4                   # Print string "str2"
        la $a0, str2
        syscall
        li $v0, 1                   # Print $s1
        move $a0, $s1
        syscall
        li $v0, 4                   # Print string "str3"
        la $a0, str3
        syscall
        li $v0, 1                   # Print $t0
        move $a0, $t0
        syscall
Exit:   li $v0, 10
        syscall
```

- Kết quả chạy thử:

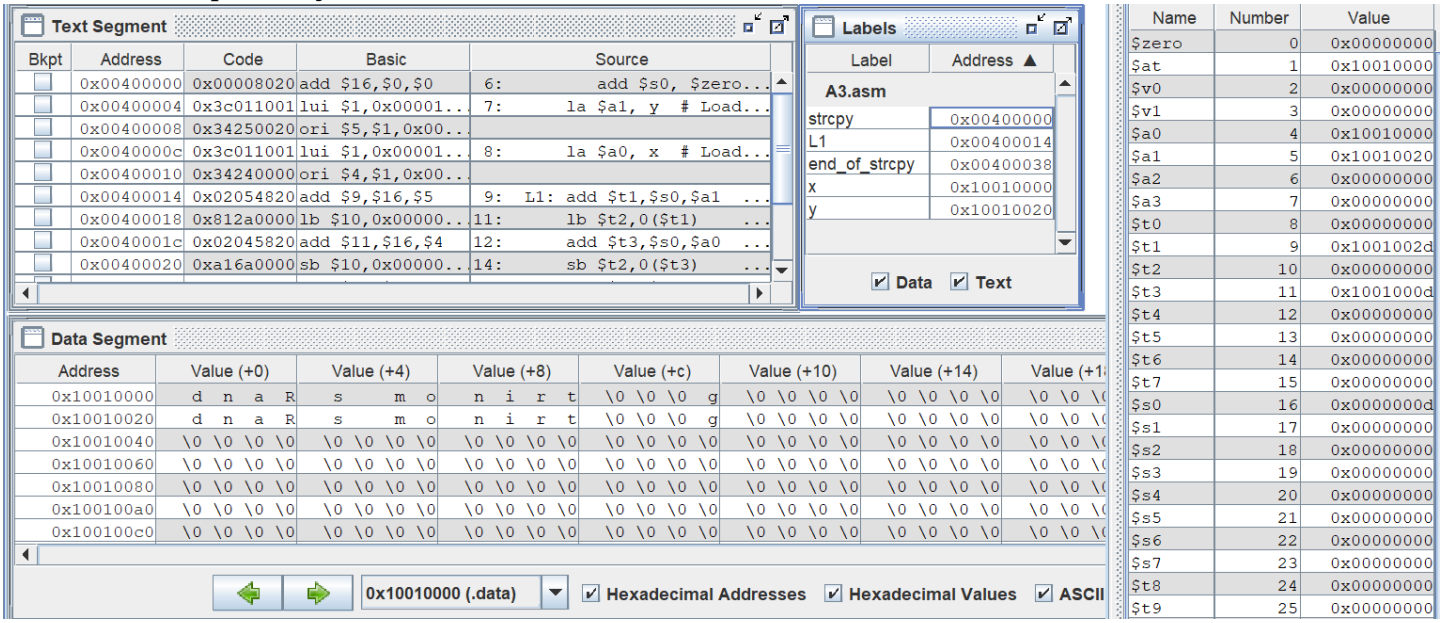


Assignment 3:

- Code:

```
.data
     x: .space 32                    # destination string x, empty
     y: .asciiz "Random string"      # source string y
.text
 strcpy:
     add $s0, $zero, $zero           # $s0 = i = 0
     la $a1, y                       # Load address of y to $a1 - src
     la $a0, x                       # Load address of x to $a0 - des
 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:
```

- Kết quả chạy thử:



⇨ Nội dung xâu từ `$a1` có địa chỉ 0x10010020 đã được copy sang `$a0` có địa chỉ 0x10010000 (hiển thị trên cửa sổ Data Segment)

Assignment 4:

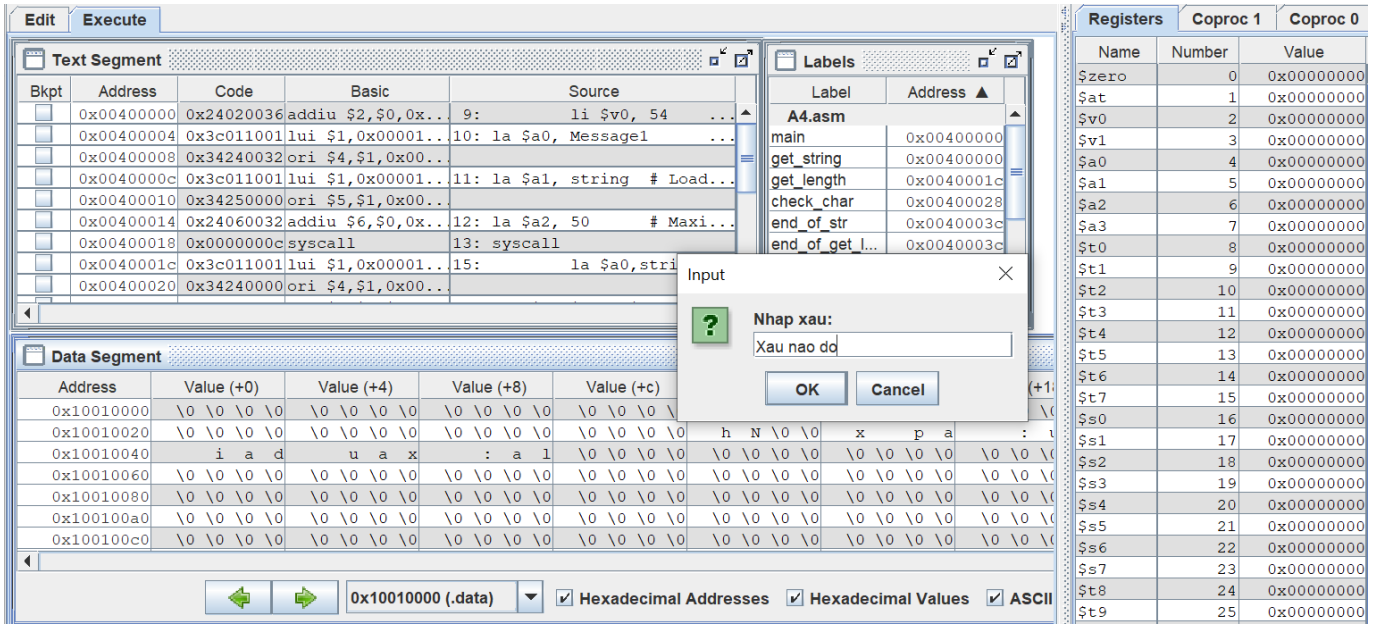
- Code:

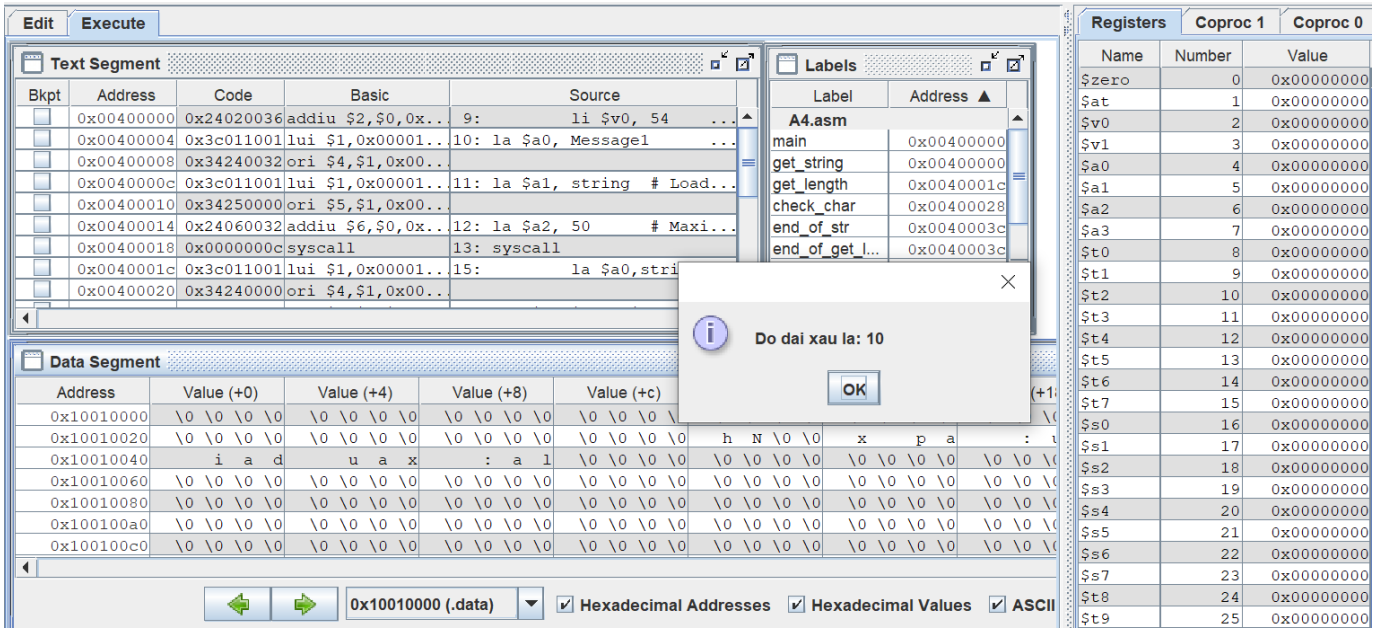
```
#Laboratory Exercise 5, Assignment 4
.data
    string: .space 50
    Message1: .asciiz "Nhap xau: "
    Message2: .asciiz "Do dai xau la: "
.text
main:
get_string:
    li $v0, 54          # Get a string from dialog
    la $a0, Message1    # Load address of the Message1 to $a0
    la $a1, string      # Load address of input buffer "string" to $a1
    la $a2, 50          # Maximum number of characters to read
    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       # Do dai xau = $t0-(null_char)
    li $v0, 56              # Show the length to message dialog
    la $a0, Message2        # Load address of the Message1 to $a0
    move $a1, $t0           # Set $a1 to contents of $t0
    syscall
```

⇨ Ta thấy ở vòng lặp cuối với lý tự kết thúc xâu thì giá trị `$t0` vẫn được tăng thêm 1

⇨ Khi xử lý in độ dài xâu cần thêm lệnh `addi $t0, $t0, -1` để in được đúng giá trị chính xác

- Kết quả chạy thử:





⇨ Kết quả chạy thử trả về đúng: Độ dài 10 đối với xâu “Xau nao do”

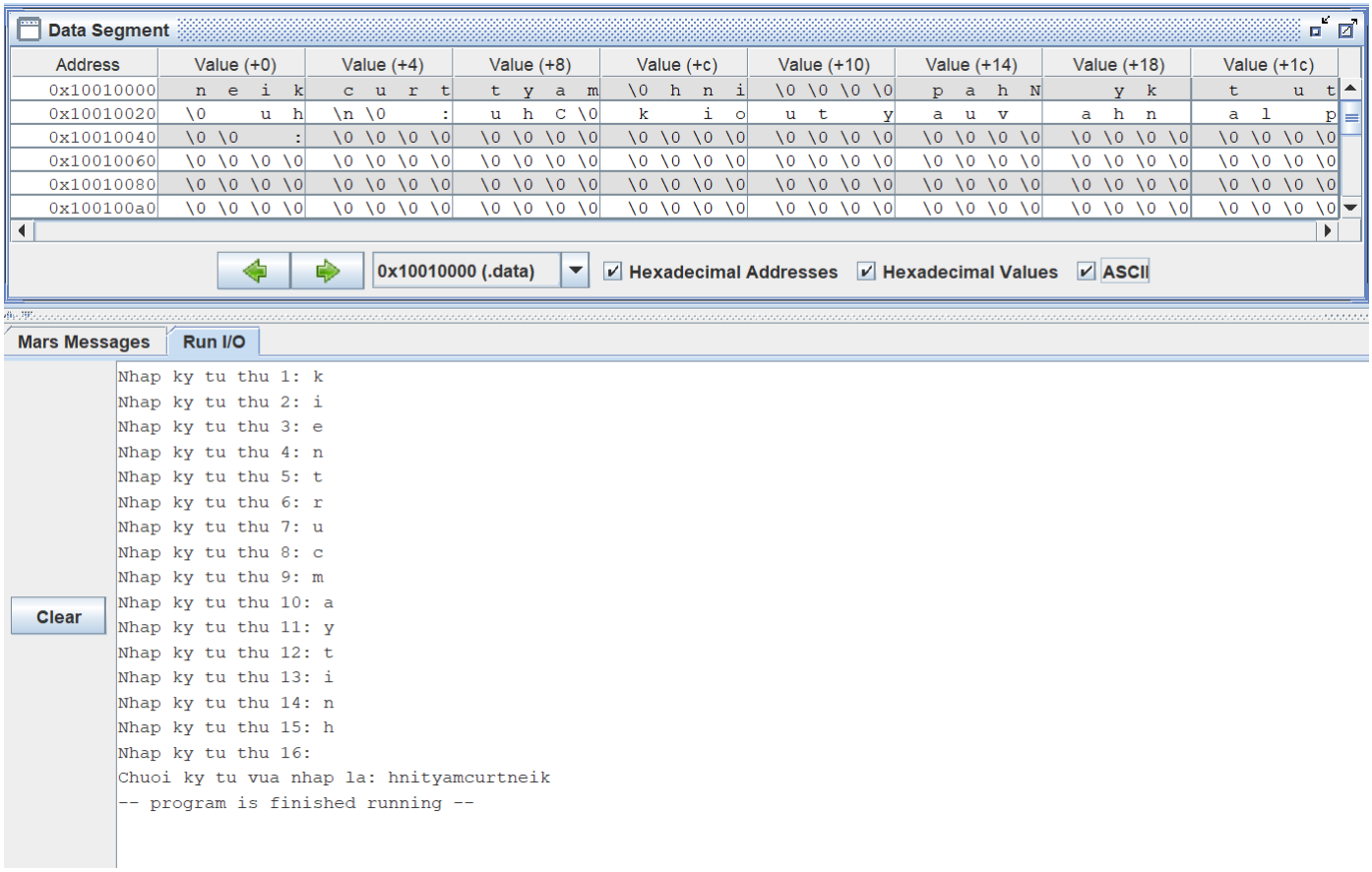
Assignment 5:

- 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 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               # Show message4
    la $a0, message4
    syscall

print_string:
    li $v0, 11              # Show ky tu tai dia chi trong $s5
    lb $a0, 0($s5)
```

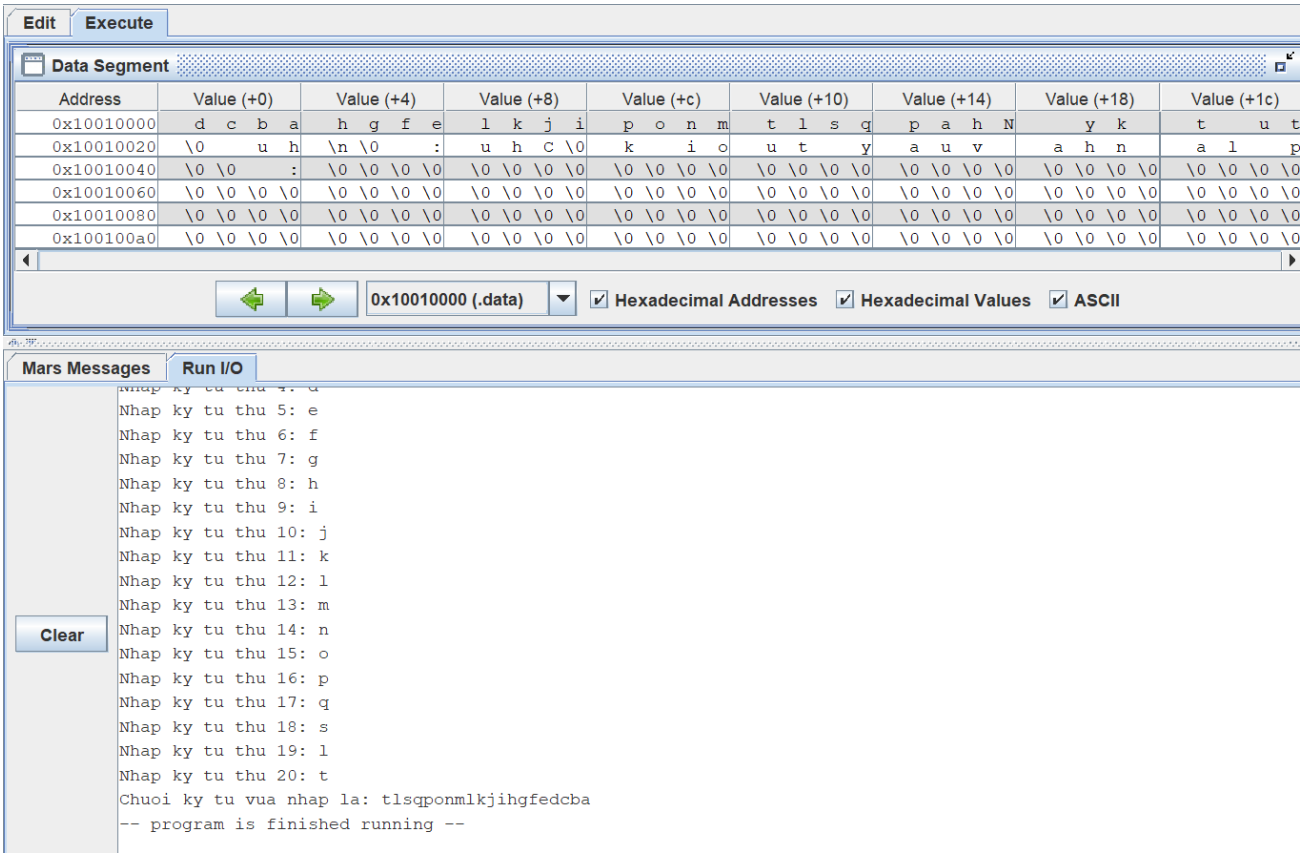
```
    syscall
    beq $s5, $s2, exit      # $s5 = address cua ky tu cuoi cung
    addi $s5, $s5, -1       # Tien dan den ky tu dau tien
    j print_string

exit:
    li $v0, 10
    syscall
```

- Kết quả chạy thử:



⇨ Kết quả khi nhập ‘kientrucmaytinh’ đã được đảo ngược thành ‘hnityamcurtneik’

⇨ Dừng nhập thành công khi nhấn Enter



⇨ Trong trường hợp nhập tới 20 ký tự chương trình tự động dừng nhập

⇨ Đưa ra kết quả đảo ngược tương ứng