Mars Simulator

CSE331 Computer Organization Problem Session#1

User Interface

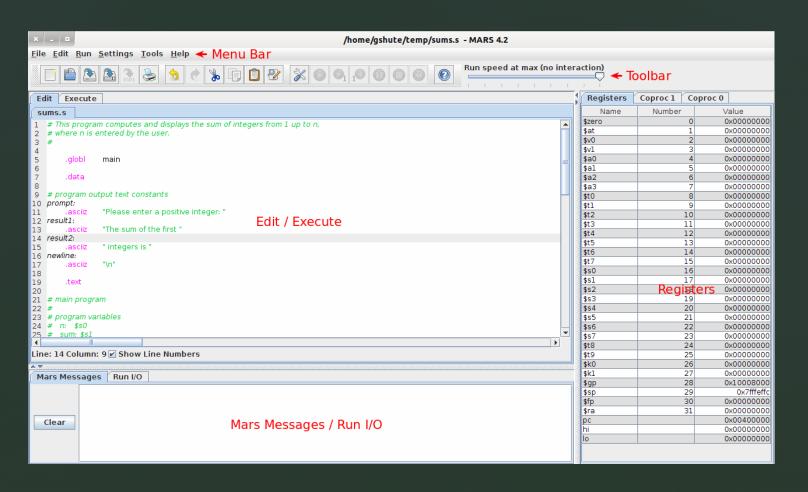


Figure 1. There are five important areas in the Mars user interface. They are named in the diagram below.

Basic Operation

Create a New File



Figure 2: You can create a new MIPS assembly language file clicking on the "New" new toolbar button.

Assembling a File



Figure 3: A MAL program is assembled by clicking on the "Assemble" assemble button

Running a Program



Figure 4: A MAL program is run by clicking on the "Go" go button.

Run Menu



Menu Item	Icon	Accel	Description
Assemble	*	F3	Assemble and load the current file
Go		F5	Run the current loaded program
Step	⊙ i	F7	Run a single instruction of the current loaded program
Backstep		F8	Undo the last executed instruction
Pause	•	F9	Pause execution of the current loaded program
Stop		F11	Stop execution of the current loaded program
Reset	@	F12	Reload the current assembled file
Clear All Breakpoints		Ctrl-K	Clear all breakpoints
Toggle All Breakpoints		Ctrl-T	Toggle all breakpoints

Printing a character:

- data
- character : .byte 'a'
- .text
- li \$v0, 11

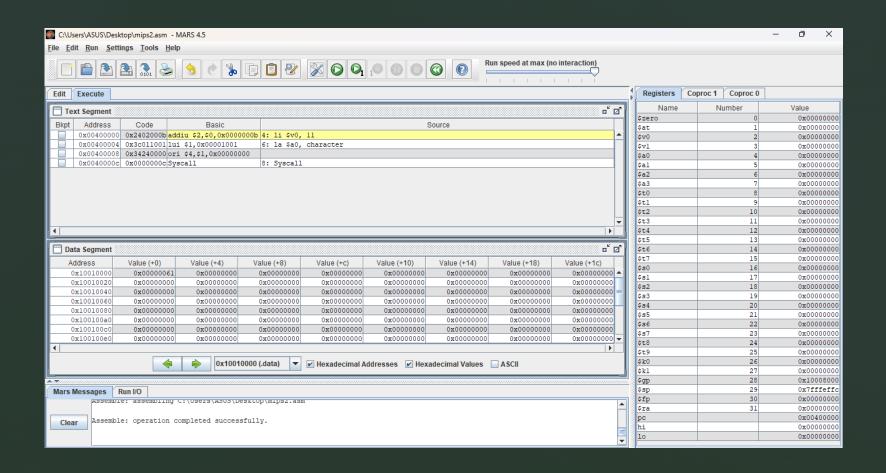
#11=system code for printing a character, \$v0=register that gets the system code for printing as value

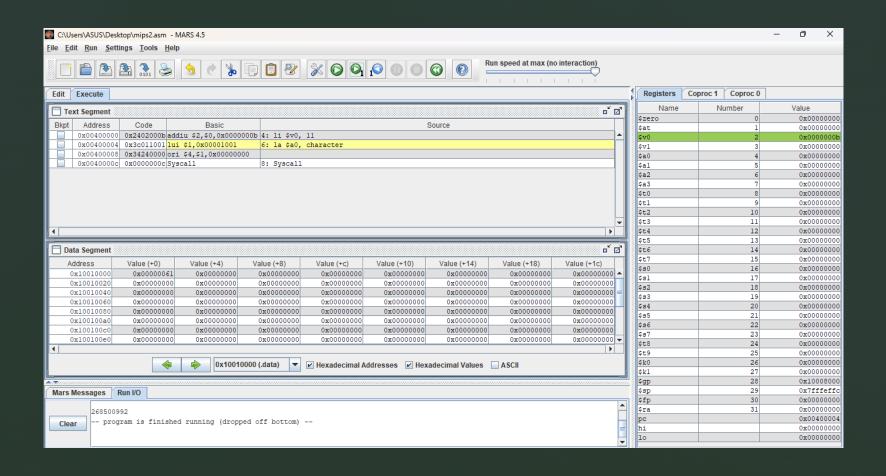
la \$a0, character

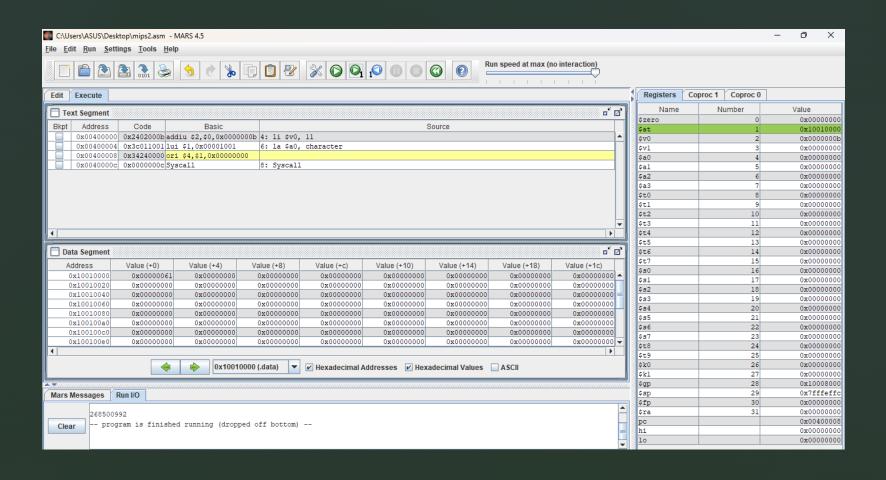
#'a'=our example character, \$a0=register that accepts the character for printing

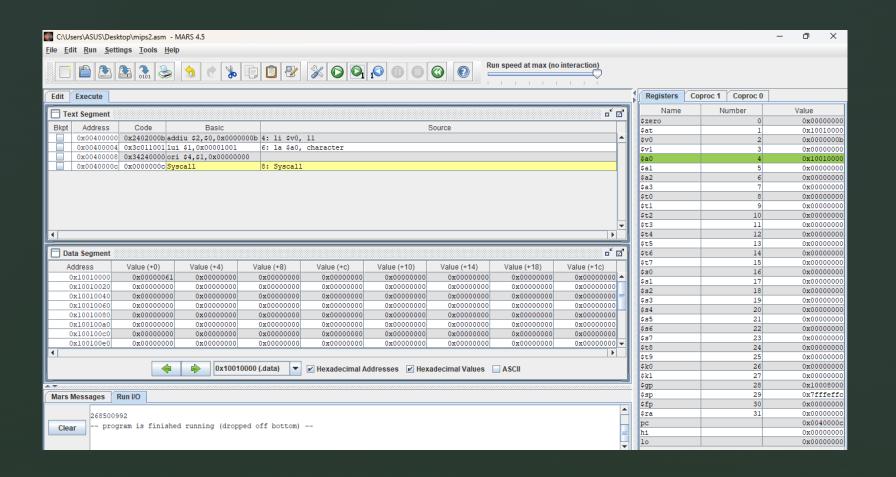
Syscall

#Call to the System to execute the instructions and print the character at the a0









Printing a number:

.data

age:.word 21

.text

li \$v0, 1

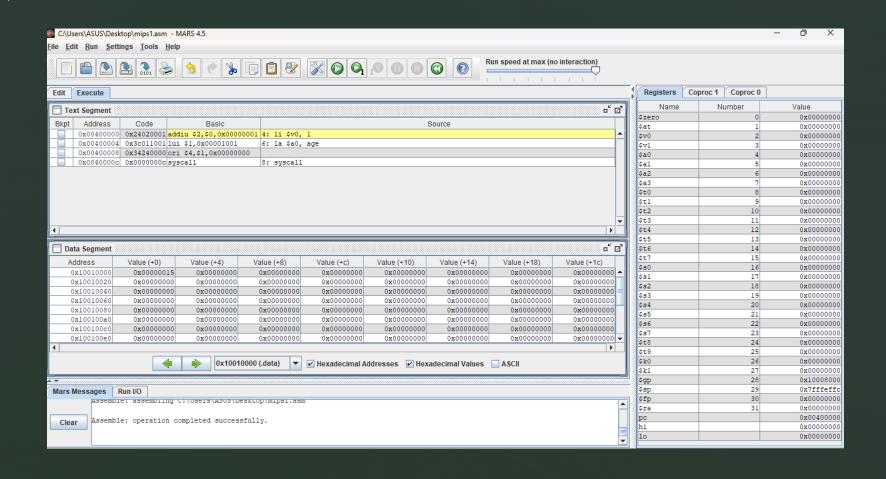
#1= system code for printing a word (32 bit integer), \$v0=register that gets the system code for printing as value

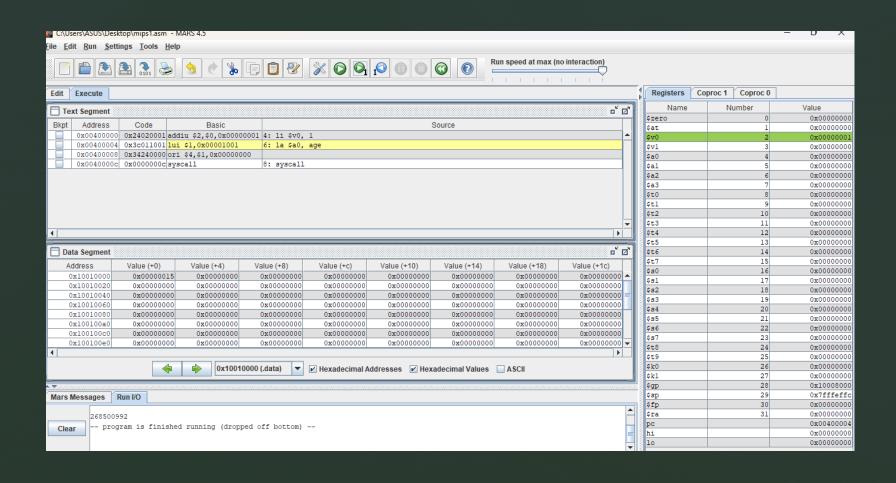
la \$a0, age

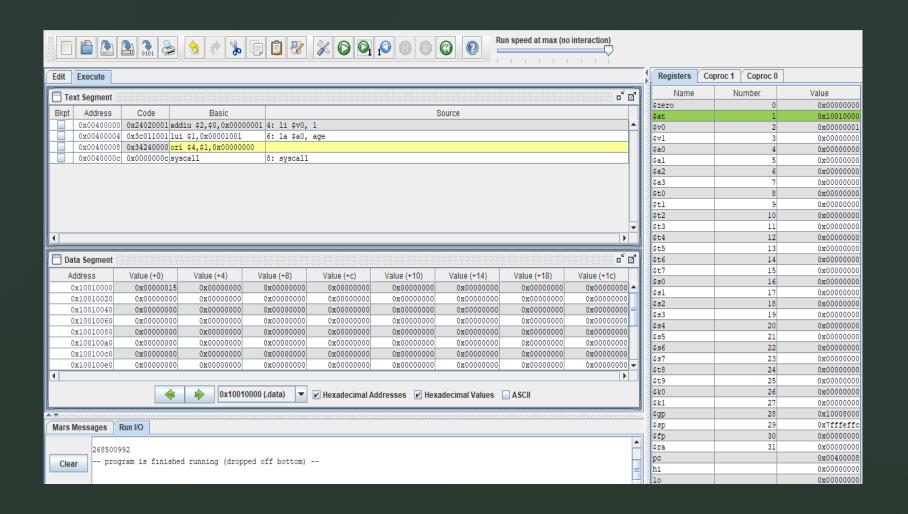
age is the variable that contains the word to be printed, \$a0=register that accepts the word for printing

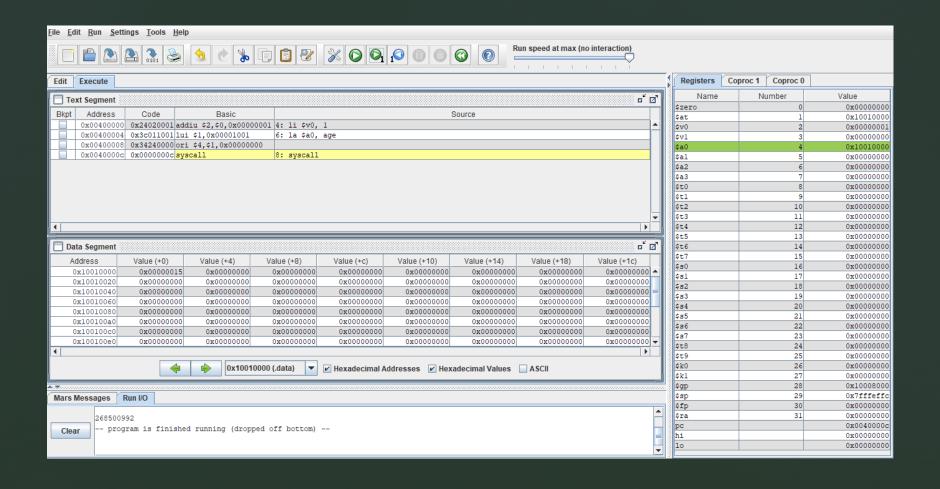
syscall

#Call to the System to execute the instructions and print the word at a0









Sum of Two Numbers

.text

• li \$t0, 5

li \$t1, 3

• add \$t2, \$t0, \$t1

li \$v0, 1

move \$a0, \$t2

syscall

■ li \$v0, 10

syscall

\$t0 register'ına 5 değerini yükle

\$t1 register'ına 3 değerini yükle

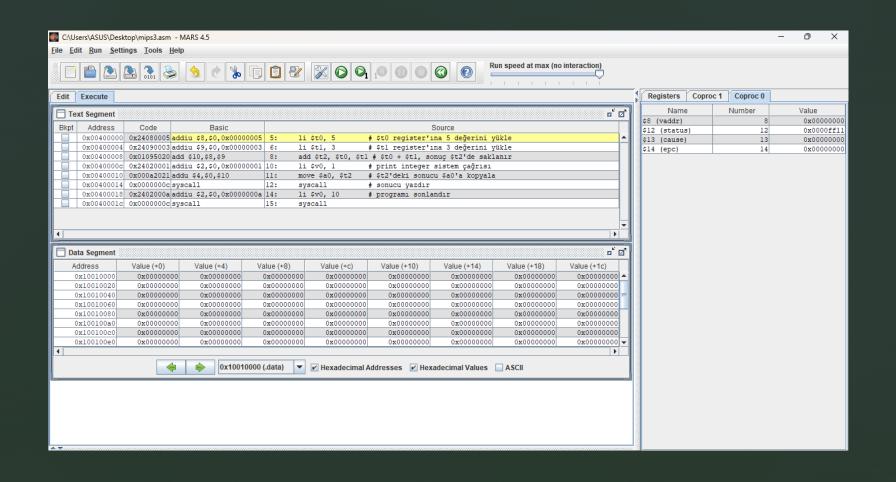
\$t0 + \$t1, sonuç \$t2'de saklanır

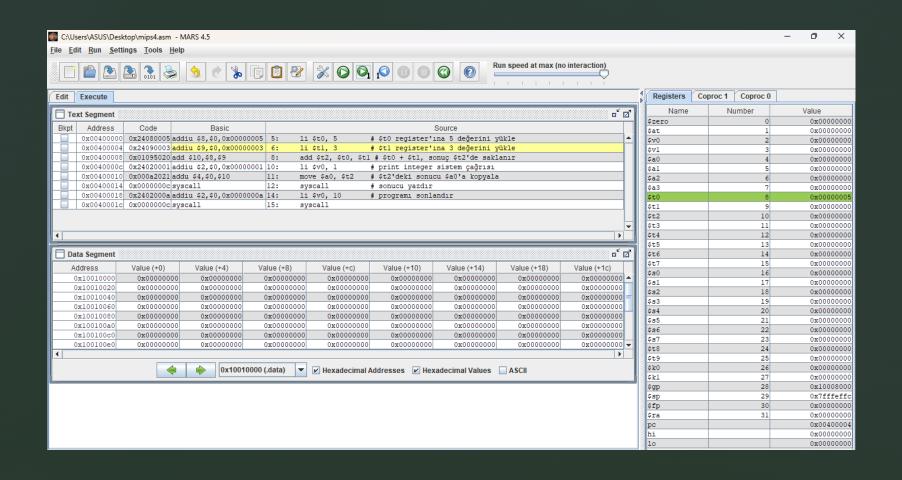
print integer sistem çağrısı

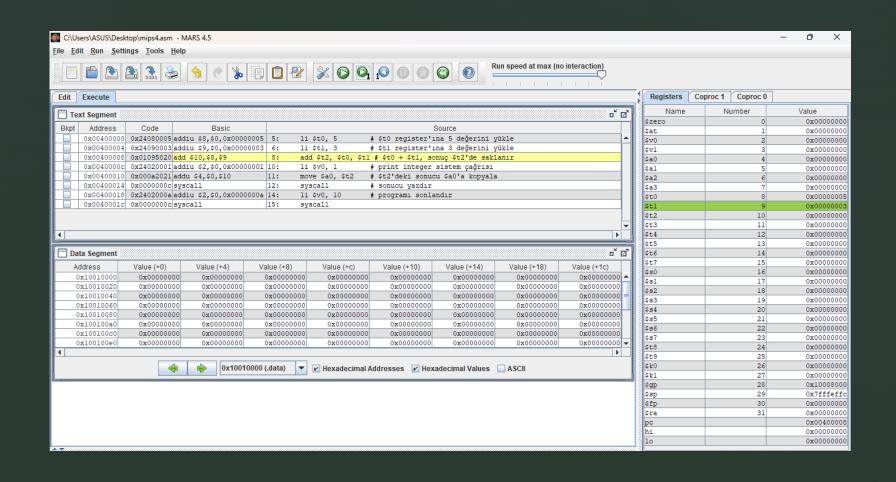
\$t2'deki sonucu \$a0'a kopyala

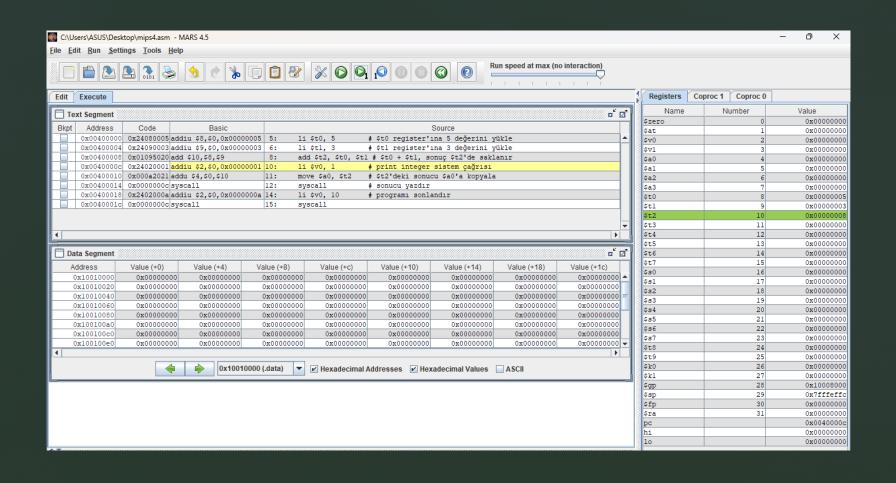
sonucu yazdır

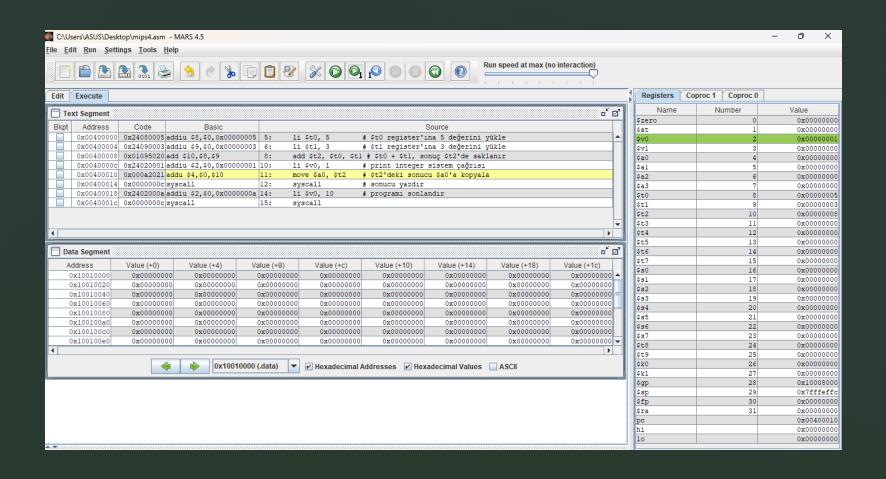
programı sonlandır

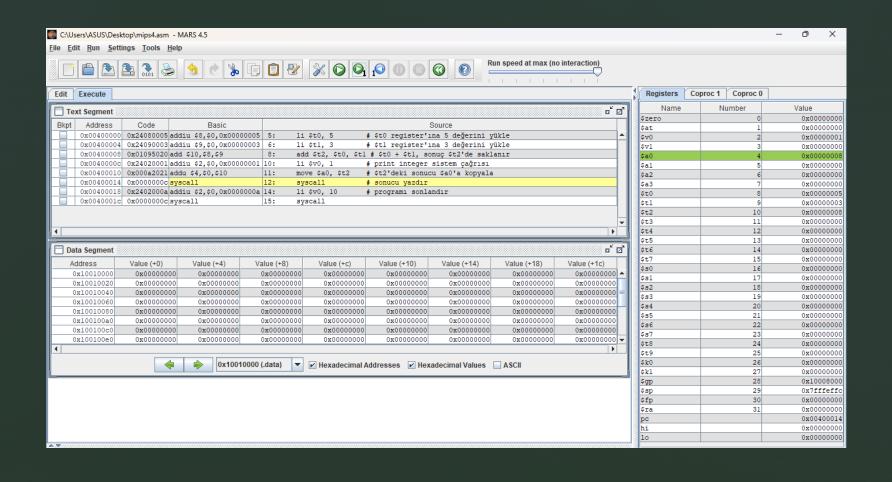


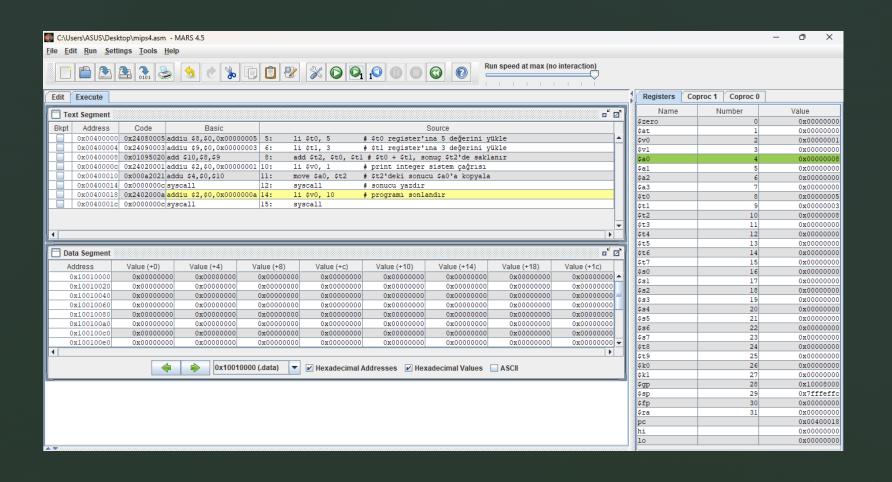


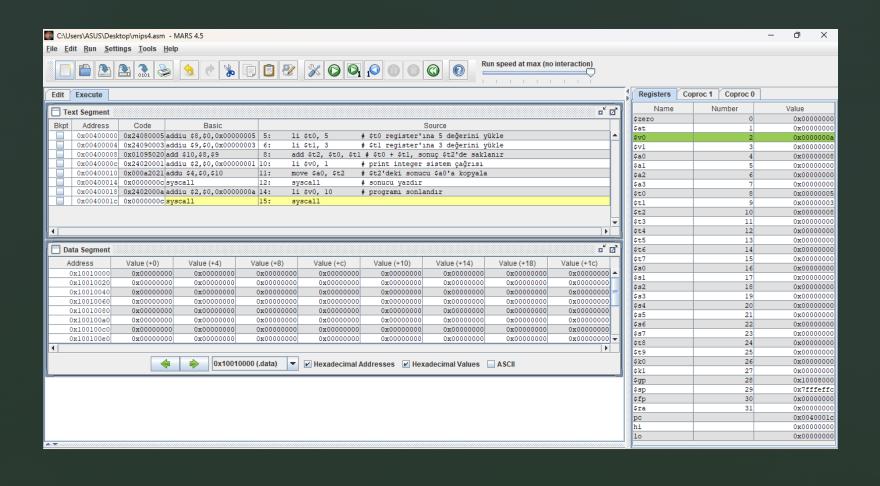












And Operator Example

- .text
- li \$t0, 6 # \$t0 register'ına 6 (binary: 110) yükle
- li \$t1, 5 # \$t1 register'ına 5 (binary: 101) yükle
- and \$t2, \$t0, \$t1 # \$t0 AND \$t1 işlemi, sonuç \$t2'de saklanır (binary: 100, decimal: 4)
- li \$v0, 1 # print integer sistem çağrısı
- move \$a0, \$t2 # \$t2'deki sonucu \$a0'a kopyala
- syscall # sonucu yazdır
- li \$v0, 10 # programı sonlandır
- syscall

