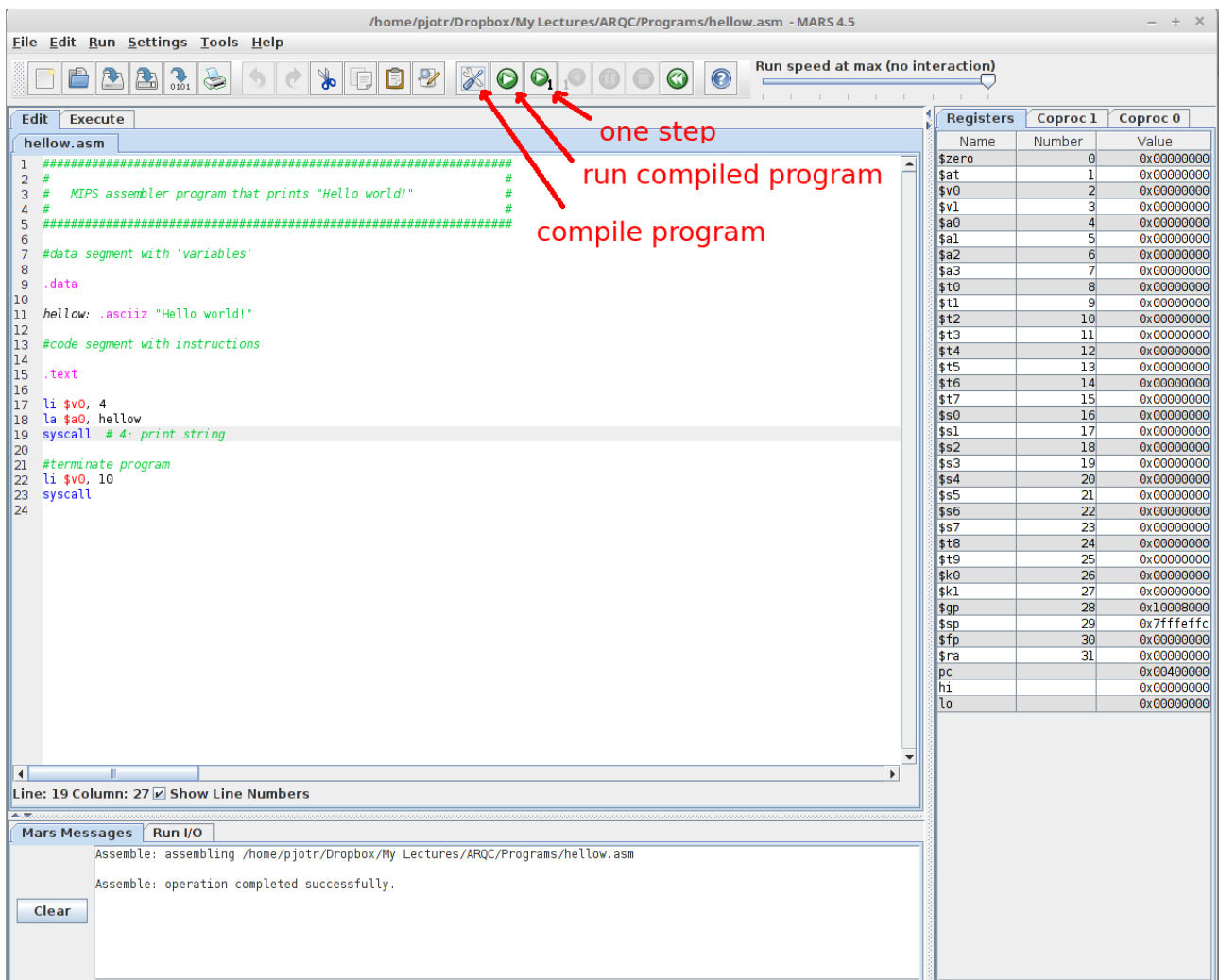# Computer Architecture
Exercise 2
MARS

Peter Stallinga
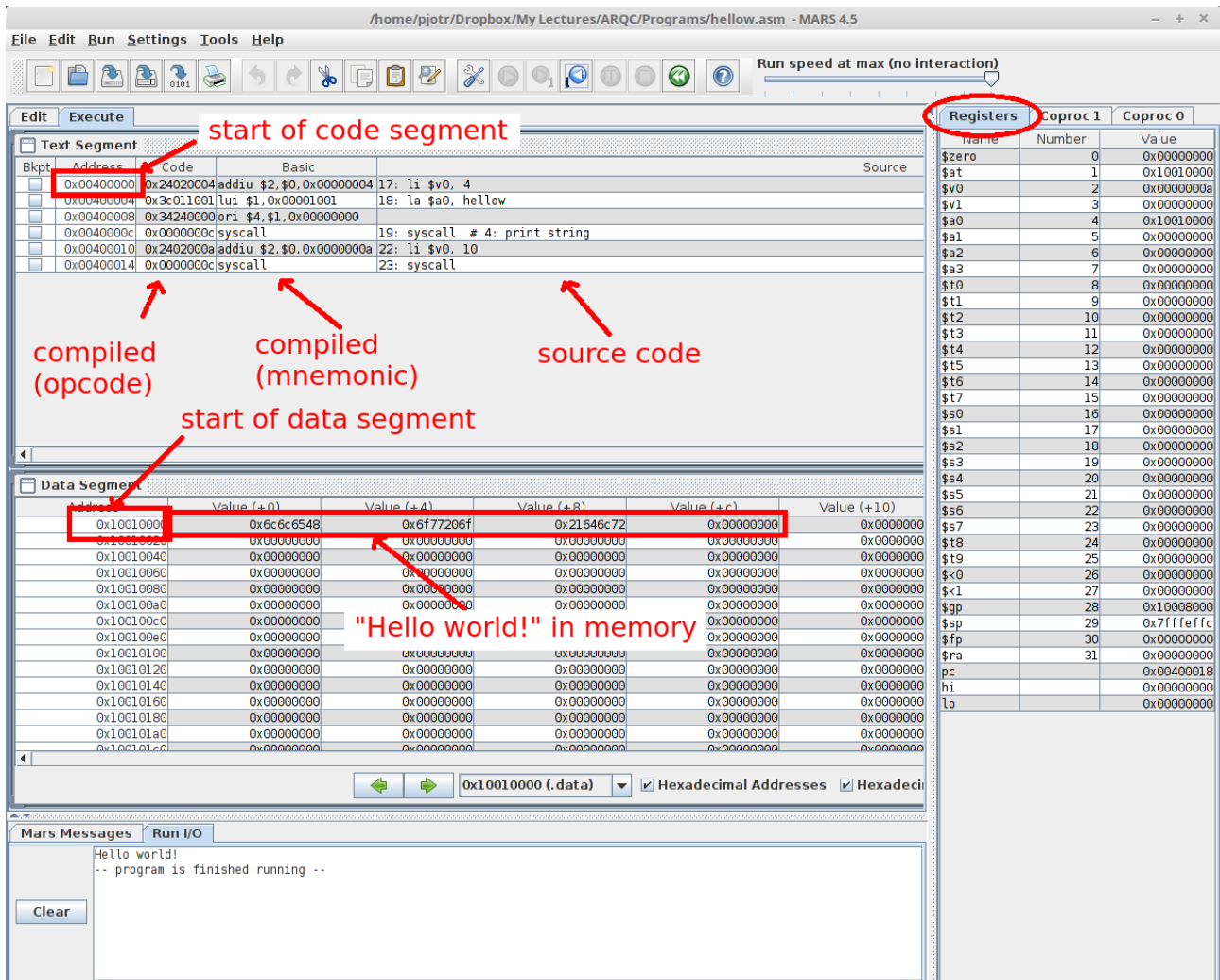Universidade do Algarve 2024-2025

Mars4_5.jar

Download the MIPS emulator environment MARS 4.5

This is a java runcode archive that can be run in any place. Linux/Windows, etc. Does not have to be installed.

The above shows MARS with a MIPS program `hellow.asm`.

Note the editor window and the compiler messages and I/O window.

Recognize the code segment (called text segment here) and the data segment. (Thus a separation of instruction codes and data!). Note also the source code (with MIPS instructions and pseudo-instructions), the pre-compiled code (MIPS only) and the final machine-language code,

On the right is the status of the processor registers.

On the bottom the I/O window.

See the appendix for the instruction set of MIPS.

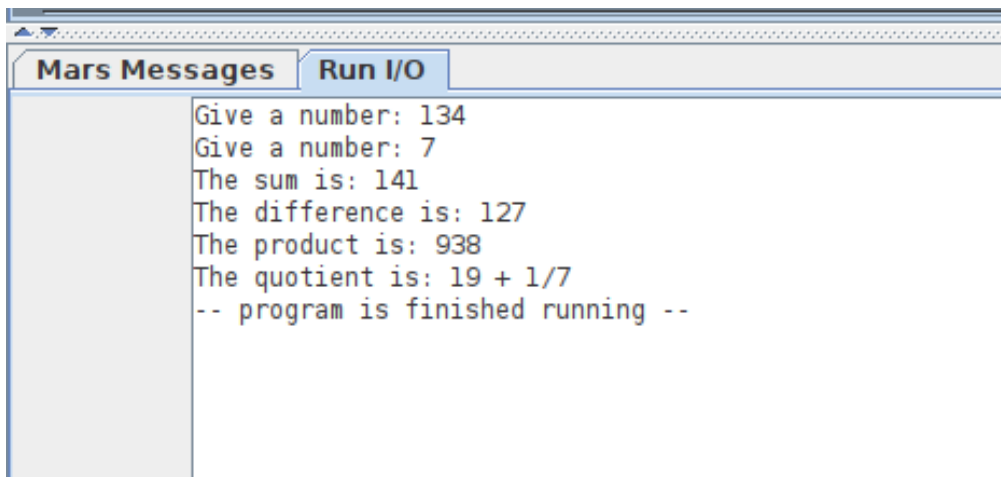Input/output we can do by calling operating system functions, 'syscalls'. See the appendix about the syscalls.
An example: to print an integer:
- place the integer into register $a0
- place 1 in register $v0
- syscall

Note: the final syscall: to terminate the program nicely we use syscall 10.

Write a MIPS program that prints "Hello world!"

Write a MIPS program that asks two numbers and prints their sum, difference, product and quotient.

```
Mars Messages   Run I/O

Give a number: 134
Give a number: 7
The sum is: 141
The difference is: 127
The product is: 938
The quotient is: 19 + 1/7
-- program is finished running --
```