UNIVERSITY OF AMSTERDAM

ing. Edwin Steffens

Practical lecturer – Informatics Institute - Faculty of Science

Computer Architecture

Lab 1 – Performance measurement

Computer Architecture course

Lab Experiments

Expectations

Introduction SIM-PL

Kickstart Lab 1

Lab Experiments

Expectations

- Labs are compulsory
- Reports filenames must be conform

  <Labname>-<YourCompleteName>.pdf
- Source code filenames must be conform

  <Labname><exercisenumber>-<YourCompleteName>.pdf
- Handed in via email before deafline: 21-09-2016 12:00 UTC.

  e.h.steffens@uva.nl and cc t.r.walstra@uva.nl

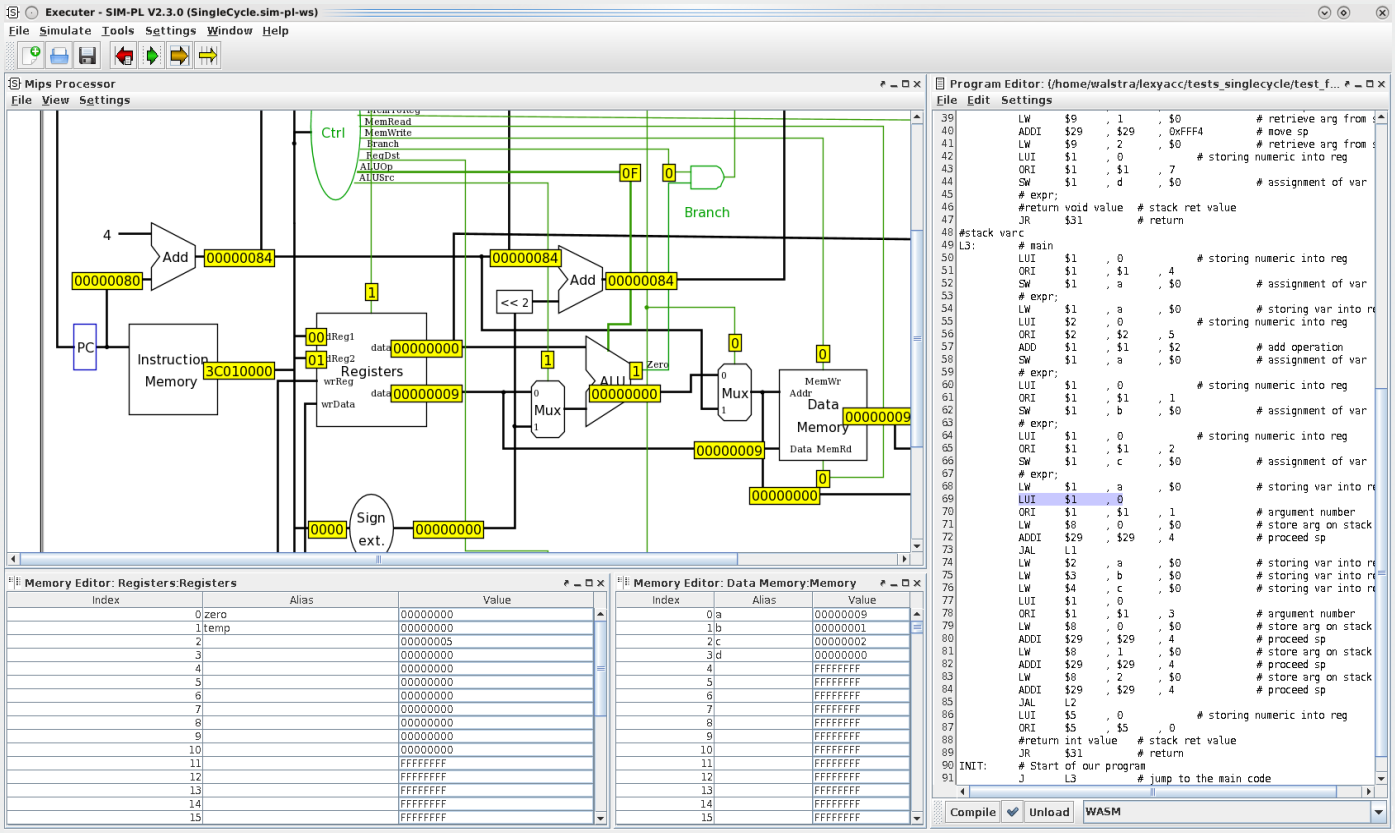
  No ZIP Files ! Not conforming? It will be rejected !

  More to read at the course page

  staff.fnwi.uva.nl/e.h.steffens/?page_id=18

Introduction SIM-PL
Logic simulator

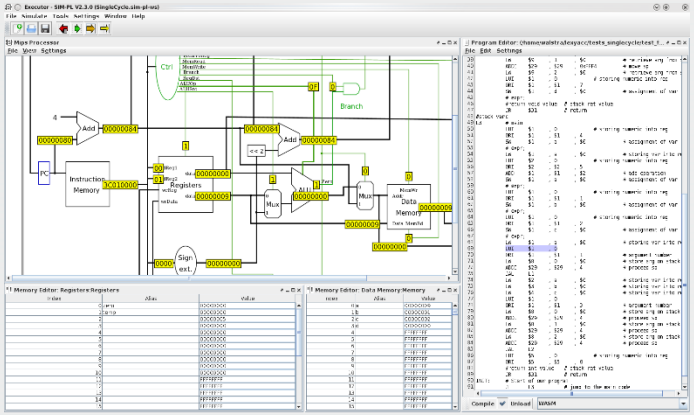
SIM-PL – Our tool to build and simulate computer architectures



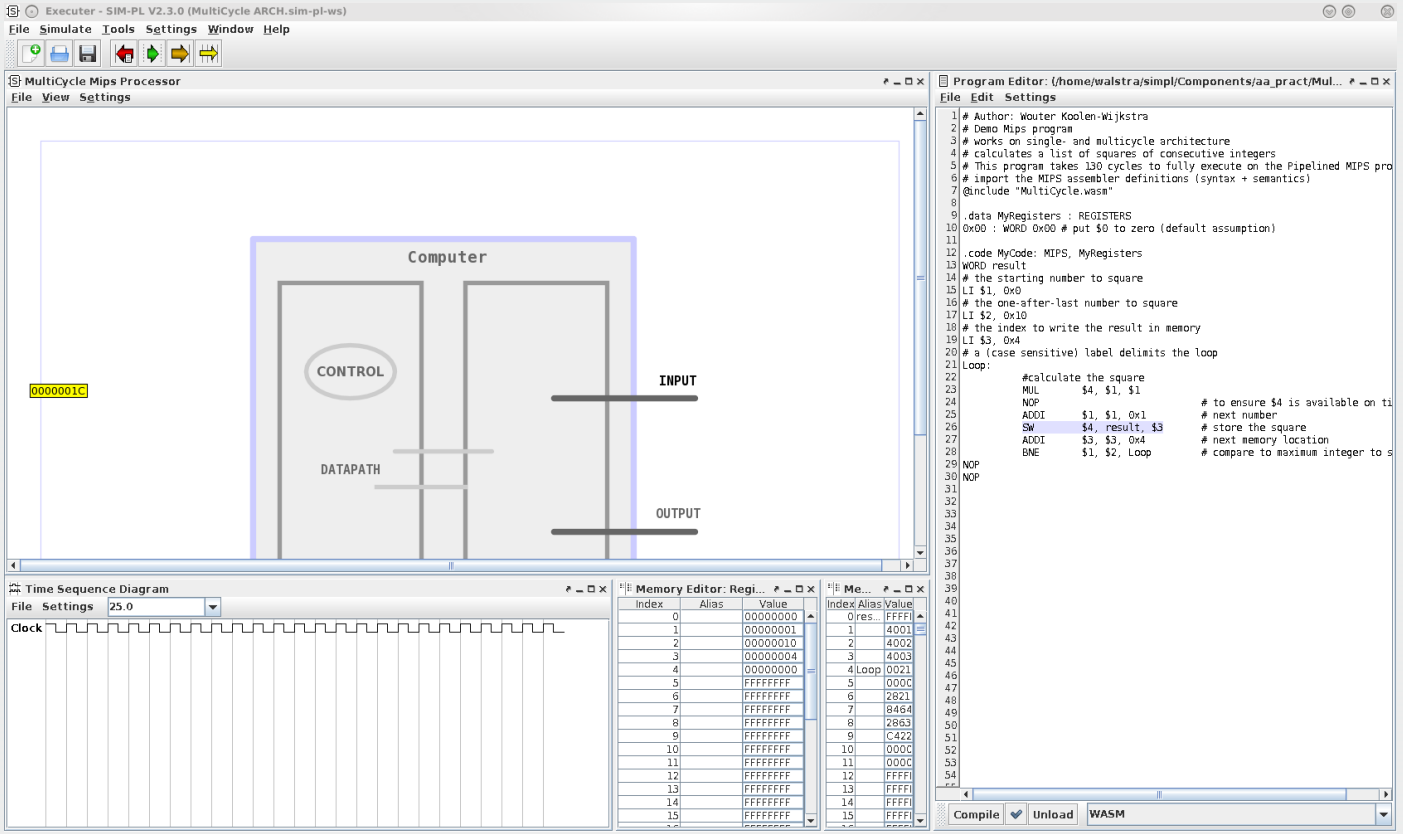
SIM-PL – Our tool to build and simulate computer architectures

- “Editor” section for building (complex) components.
- “Executer” section for simulating

- Written in Java



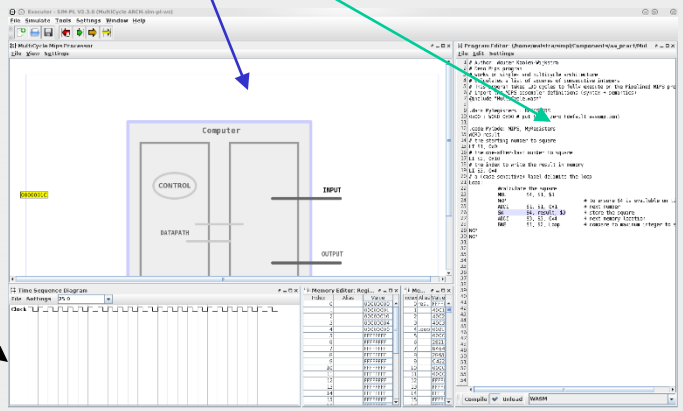
SIM-PL - Executor



SIM-PL - Executer

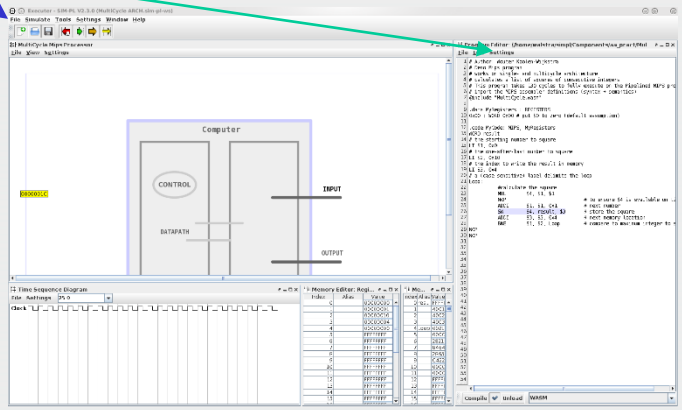
- Executer is started at the command prompt
  - Java –jar Executer.jar
- Designs are loaded in the “Component view”.
- Programs are loaded in the “Program editor”.

- Simulation results are shown in
  - Time sequence diagram
  - Memory editor
  - Register editor



SIM-PL – Executer Running Simulations

- Designs are loaded in the “Component view”.
  - File->open or new
- Programs are loaded in the “Program editor”.
  - File->open
  - Compile
- Compiled code transferred to the design
  - Press the Red arrow button
- Simulation starts by pressing the
  - Green or Yellow or Orange button.



Downloads available

Manual

SIM-PL 2.3.0

Additional components

Course webpage e.h.steffens

Lab 1

Performance of Computer Architectures

Lab 1 experiment - Performance

Goal

To understand how performance is measured.

How

By doing experiments in SIM-PL the logic simulator.
Researching by running three small programs on three architectures

Tools

SIM-PL (Logic simulator)

Results

The results of the assignments are handed in for grading.

Kickstart Lab 1

Description
Course webpage
staff.fnwi.uva.nl/e.h.steffens

Lab 1 – Experiment 1

- Goal is to determine the CPI of a computer architecture
- How ?
- Load an architecture in SIM-PL
- Execute a program
- Count the clock cycles and instructions until the program ends
- Determine the CPI (#clocks / #instructions)

Lab 1 – Loading an architecture

- Download and install SIM-PL
- Start the executer
- Java –jar executer.jar (Linux case sensitive)
- Load the SingleCycle architecture worksheet
- File->Open
    - SingleCycle-architecture.sim-pl-ws
    - Let’s start with an addition of two numbers
  - Load the assembly program addition.wasm in the Program Editor
  - Press the button “Compile” and wait for the checkmark

Lab 1 – Running the source code

- Load the compiled source code
  - Press the “Red arrow” button
  - First instruction is highlighted
- Execute the first instruction
  - Press the “Orange arrow” button
  - Clock cycle appears in Timing window
- Continue until all instructions are executed
  - No highlighted instructions is end
  - Don’t forget to count !
- Write down the result in your report.
- Continue with the other programs and architectures

End of kick start session

Are there any questions ?

See you next time

Success !