Hardware

Presentation

Jean-Malo Meichel

September 2023

Introduction

HDWR - Target Learning Outcome

Target Learning Outcome

What will you be able to do after this class ?

Target Learning Outcome

What will you be able to do after this class ?

- **Describe** the components of a CPU and their interactions using a provided diagram.

Target Learning Outcome

What will you be able to do after this class ?

- **Describe** the components of a CPU and their interactions using a provided diagram.
- **Convert** a sequence of bits in different values depending on the target type.

Target Learning Outcome

What will you be able to do after this class ?

- **Describe** the components of a CPU and their interactions using a provided diagram.
- **Convert** a sequence of bits in different values depending on the target type.
- **Map** boolean circuits, time and memory concepts in a CPU by **explaining** links between them.

Target Learning Outcome

What will you be able to do after this class ?

- **Describe** the components of a CPU and their interactions using a provided diagram.
- **Convert** a sequence of bits in different values depending on the target type.
- **Map** boolean circuits, time and memory concepts in a CPU by **explaining** links between them.
- **Explain** the specificities and technical constraints of a given CPU architecture by linking them to the syntax and semantics of an assembly language.

Target Learning Outcome

What will you be able to do after this class ?

- **Describe** the components of a CPU and their interactions using a provided diagram.
- **Convert** a sequence of bits in different values depending on the target type.
- **Map** boolean circuits, time and memory concepts in a CPU by **explaining** links between them.
- **Explain** the specificities and technical constraints of a given CPU architecture by linking them to the syntax and semantics of an assembly language.
- **Produce** an assembly program involving the usage of a stack to call functions and save a context.

Lesson Plan

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)
- Binary signed representation
- Floating point representation

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)
- Binary signed representation
- Floating point representation
- Boolean algebra
- Karnaugh maps
- Arithmetic

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)
- Binary signed representation
- Floating point representation
- Boolean algebra
- Karnaugh maps
- Arithmetic
- Sequencial Logic
- Memory

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)
- Binary signed representation
- Floating point representation
- Boolean algebra
- Karnaugh maps
- Arithmetic
- Sequencial Logic
- Memory
- Assembly first steps

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)
- Binary signed representation
- Floating point representation
- Boolean algebra
- Karnaugh maps
- Arithmetic
- Sequencial Logic
- Memory
- Assembly first steps
- Assembly stack and routines

Lesson Plan

Which concepts will we explore in this lesson ?

- Binary unsigned representation (Autonomy)
- Binary signed representation
- Floating point representation

Week 36

- Boolean algebra
- Karnaugh maps
- Arithmetic
- Sequential Logic
- Memory

Week 37

- Assembly first steps
- Assembly stack and routines

Week 38

Moodle

Moodle

All the ressources you need will be provided on the HDWR moodle page:

- Slides
- Lectures
- Tutorials
- Announcements and communications

Exams

Exams

Each week will begin by a 1h exam on Moodle to evaluate your learnings from the previous week.

Next monday you **will** be evaluated on the tutorials you did in autonomy and the tutorials that we will carry out this week.

Exams

Each week will begin by a 1h exam on Moodle to evaluate your learnings from the previous week.

Next monday you **will** be evaluated on the tutorials you did in autonomy and the tutorials that we will carry out this week.

Final grade will be calculated as follows: Each of the 3 moodle exams and the final assembly teamwork are worth $1/4$ of the final grade.

Self-Evaluation

Each week, you will be provided an **optional** exam on Moodle.

The content of theses exams will be similar to that of the mandatory ones.

Theses exams **will not** be part of the final grade and are only here to let you prepare for the mandatory tests.

Assembly teamwork

Assembly teamwork

During week 38, you will be asked to work in group of two on a simple assembly program.

This work will be graded during the last practical session.

You **must** register your group to the HDWR moodle page.

QUESTIONS ?

CPU Schematic