

Computer Systems and -architecture

Retake project

1 Ba INF 2022-2023

Kasper Engelen

`kasper.engelen@uantwerpen.be`

Time Schedule

Projects are solved individually. At the evaluation moment, you will present your solution by giving a demo and answering some questions. The date and location of the evaluation moment will be communicated later on.

You will submit a solution for all seven projects from the first semester, with the differences explained in this project description. Covering all seven projects, you submit one report by filling in `verslag.html` completely. A report typically consists of 1000 words and a number of drawings/screenshots. Put all your files in one `tgz` or `zip` archive, as explained on the course's website, and submit your report to the exercises on Blackboard. **The assignment has to be handed in on Wednesday 16 August 2023, 22h00.**

Project

Extend your datapath to support data words (in register and data memory) of 20 bit. Aside from changes to the datapath itself, this will require changes to:

- ripple-carry adder and carry-lookahead adder
- ALU (and all ALU instructions)
- register and register file

The instruction set of your datapath remains the same. Note that the `ori` operation still only operates on the **lower 8 bits**, and the `lui` operation still only operates on the **upper 8 bits**. **The other assignments remain the same.**

Example: if we do "`lui r1 1`" then `r1` will be equal to 4096. In binary this is equal to:

0000 0001 0000 0000 0000

Make sure you use `TestRetake.py` for this project. You will have to write new tests that are suited to 20-bit arithmetic. Also make sure you use the 20-bit versions of `ALU_GroupXX` and `SD_GroupXX`. As always, if you have questions about the script, cannot get it to work, or suspect that there is a bug, please contact the teaching assistant.