

# CS5119: Advanced Computer Architecture Lab

## Lab 5

Deadline: 9th October 11:59 PM.

Problem 1: Generate the binaries of micro-benchmark suite for RISC-V ISA using riscv-gnu-toolchain

Problem 2: Run the applications (any 10) in gem5 in SE mode using out-of-order and in-order execution. Analyze and compare the results and discuss it in your report.

Installation steps:

1) riscv-gnu-toolchain:

- a. `$ sudo apt-get install autoconf automake autotools-dev curl python3 libmpc-dev libmpfr-dev libgmp-dev gawk build-essential bison flex texinfo gperf libtool patchutils bc zlib1g-dev libexpat-dev`
- b. `$ git clone https://github.com/riscv/riscv-gnu-toolchain`

To build the Newlib cross-compiler, pick an install path. If you choose, say, /opt/riscv, then add /opt/riscv/bin to your PATH now. Then, simply run the following command:

- c. `./configure --prefix=/opt/riscv`
- d. `make`

2) Micro-benchmark:

<https://gem5art.readthedocs.io/en/latest/tutorials/microbenchmark-tutorial.html>

- a. `$ git clone https://github.com/darchr/microbench.git`

- b. \$ cd microbench
- c. \$ make RISCv