

## Exam

Issued: January 11, 2019, 13:00  
Hand in: January 11, 2019, 16:00

### Exam directives

In order to pass the exam, the following requirements have to be met:

- Clear your desk (no cell phones, cameras, etc.): on your desk you should only have your Legi, your pen and your notes. We provide you with the necessary paper, exam sheets and electronic material.
- Carefully read the title page of the exam. Write your name, student ID and the computer hostname where requested. Before handing in the exam, **SIGN ON THE FIRST PAGE**.
- The personal summary consists of no more than 4 sheets (8 pages). The personal summary must be handwritten. You are not allowed to bring a copy of somebody else's summary.
- Your answers should be handwritten in blue or black (no pencils), clearly readable and in English. Only one answer per question is accepted. Invalid answers should be clearly crossed out.
- To answer new questions (e.g. Question 1, not sub-questions!), always use a new page. On the top-right corner of every page write your complete name and Legi-ID. Unless otherwise noted in the question, you should always hand-in your answers on paper!
- The solutions of the programming problems have to be saved in the corresponding directories, as detailed later. At the end of the exam the assistants will give you a summary of the files that have been collected. Carefully check its content and sign to accept it.
- You must hand in: the exam directives (this sheet), the signed exam title page with question sheets and your solutions. The exam cannot be accepted if the exam title page or the question sheets are not handed back.
- If something is disturbing you during the exam or preventing you from peacefully solving the exam please report it immediately to an assistant. Later complaints will not be accepted.
- Although we suggest to solve simple questions without the use of the computer, you are allowed to use it to help you answer any question. The "exam mode" of the computers is that they are offline (no internet). You may use any resources available on the machine.

## Computer Setup

**⚠ Carefully read the following instructions before starting with the exam!**

Machines automatically logon in exam mode. To start the session please enter your **first and last name**. Afterwards, you will be asked to enter your **nethz** user name.

In your home directory (`~`) you will find the three directories `documentation/`, `questions/` and `questions_template/`. The directory `documentation/` contains the course material files we provide. The directory `questions/` will contain **your** solutions. Only files in the directory `questions/` will be fetched from your local machine and considered for the grading of the exam. Please make sure to work only in this directory.

Inside your `questions/` directory you will find the skeleton codes you need for the programming exercises. They are organized in the following directories:

- `coding_1_julia_set_omp`
- `coding_2_nbody_ispc`
- `coding_3_BLAS_mpi`

A clean copy of the skeleton codes is available in your `questions_template` directory.

**⚠ The files in this directory are not write-protected. Do not remove or overwrite them in case you need a fresh copy of a skeleton code.**

**ISPC:** The ISPC executable is available on your system. To obtain help for its options you can type:  
`$ ispc --help`

**MPI:** The MPI framework must be loaded with:

```
$ module load mpi
```

To execute MPI codes on  $P$  local processes you have to use:

```
$ mpirun -n P ./program
```

**Documentation:** In the directory `~/documentation/manuals` you will find reference manuals and the `cppreference.com` website. To extract the latter one, you can use the following command:

```
$ tar zxvf cpp_reference_html_book_20180311.tar.gz
```

the main page is `reference/en/index.html`.

The Intel Intrinsic Guide is available as a stand-alone application in `~/documentation/manuals/intel_intrinsics`. It can be launched from the command line with the command:

```
$ ./Intrinsics_Guide_for_Intel.sh
```

In `~/documentation/lectures` and `~/documentation/notes` you will find all handouts of the lecture, and in `~/documentation/exercises` the solution sheets of the exercises. The MPI and OpenMP standards and reference cards can be found in `~/documentation/manuals`. To open a file with its default application from the command line you can use:

```
$ xdg-open <file>
```

## At the end of the exam

At the end of the exam you must **stop working immediately**. Be sure to have saved all open documents before the end.