Final Project

The final exercise of this course gives you an opportunity for extending what you have built in the previous exercises in an open-ended and collaborative manner.

OBJECTIVES

You will demonstrate your ability to understand, design, code, integrate, and document computing procedures for the three kinds of GIS functionality you have learned in this course, that is, preparation, processing, and presentation of geographic data, specifically raster data.

You will do so by building a raster-based GIS and writing a user's manual for it.

COLLABORATION

This is a group project. The class is divided into groups of four (plus or minus one) students.

TASKS

The project involves three major tasks.

1. Implement a GIS software application

The specific tasks include
- Decide what formats of data are supported, what algorithms are implemented, and how these data and algorithms are accessed by the user.
- Modify or extend algorithms that have been implemented in the exercises.
- Implement algorithms that have not been implemented in the exercises (although they may have been discussed in class)
- Integrate all the data structures and algorithms into a system and give it a friendly user interface.

You may need to use commercial GIS software (e.g., ArcGIS) to prepare sample data, to visualize output, or to analyze geographic phenomena. As you have experienced in the laboratory, it is nice to have a mean to couple your GIS and other systems through files.

NOTE: Whenever you encounter a problem, consult the teaching staff sooner than later. Don't get stuck.

2. Write a user's manual

The manual should describe at least:
- what formats of data can be read and saved
- what tools (or algorithms) are available and what they do
- how the tools have been implemented (optionally with their pseudo-code)
- how the tools are organized, invoked, and controlled. Illustrate there usage with pictures of their associated graphical user interface elements.

NOTE: It is acceptable to (re)use any part of code written by others unless doing so is illegal. However, you must provide information on where and how you have got it. Just be honest. Violation of these will result in serious problems.

3. Prepare an oral presentation

All groups will present their systems in professional manners during the final lecture on **December 13, 2021**. Each presentation is strictly limited to **30 MINUTES** including time for questions and discussions. The presentation should begin with a brief description of the system (preferably with slides) and include an actual demonstration of how to use it. **Pretend as if you were salespersons!**

NOTE: Attendance of the presentation session is required unless a special reason is accepted by the instructor *in advance*.

SUBMISSION

Upload the following documents to CANVAS no later than **December 21, 2021**.
- the user's manual for your system in PDF format,
- an executable JAR file for your system,
- all the relevant source code compressed into one zip file, and
- all the presentation slides.

GRADING

It is **mandatory** to successfully complete the final project as well as all the lab exercises in order to pass the course. The final project will be evaluated only if all the required materials are submitted in time and the oral presentation is made on the specified date. You and your teammates will receive the same grade.