ISA

Geographic Information Systems 2026/2027

Lesson 16 - Assignment description and discussion

LISBOA | UNIVERSIDADE DE LISBOA INSTITUTO SUPERIOR DE AGRONOMIA

Evaluation

Practical component **(45%)**:

- **2 Individual assignments (5% + 5%)**
- **1 Group Assignment** (2 people) **(35%)**
  - GIS project
  - Report
  - Pdf files with diagrams

  } *Mandatory*
  - Minimum grade: 10

Theoretical component **(55%)**:

- **Test**

OR — Minimum grade: 8

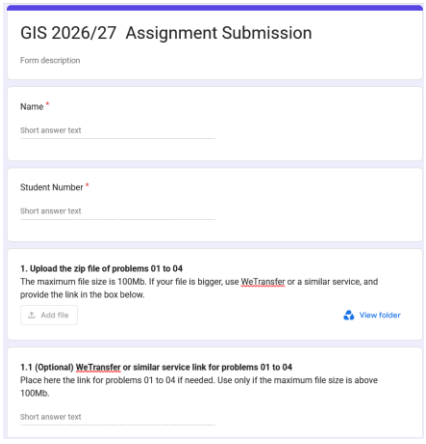
- **Exam**

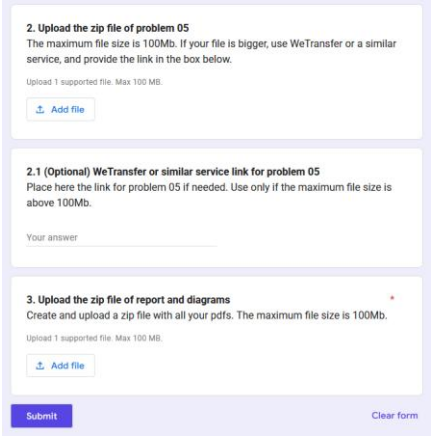
Assignment

Context

- The deadline is **10th of December 2026, 5pm**
- It counts **7/20 (maximum)** of the final grade
- The work will be done and discussed **in groups of 2 students**.
- The assignment is structured into **5 problems**.
- Each group receives an assigned zone number. For Problem 02, select the polygon in EditingZones whose StudentGroup value matches that number. The number will also be sent by email.
- For output names that use <student number>, use the ISA student number of either member of your pair. Use the same number throughout.
- The work should **be submitted** before the deadline through the form https://forms.gle/Gyao8KzCu4QeretD6

Google form





Evaluation of the assignment

- Correctness of solutions and answers – **50%**
- Methods used in problem solving – **20%**
- Clarity and critical view of the report – **20%**
- Coherence of the overall work – **10%**

Deliverables

- A zip file of the main project directory (Problems 01 to 04) and another zip file of the additional project directory (Problem 05) containing:
  - The **project file** containing all the output and relevant intermediary layers (legends and labels when required and/or appropriate) QGIS Project **(.qgz),** ArcGIS project File **(.aprx)**
  - The subdirectories **DataIn** and **DataOut**
  - All the **final data sets** that answer the questions, and all the relevant **initial intermediary data sets, along with their metadata,** used to reach the final answers
  - For problem 01, **do not include** the original DEM downloaded file

Deliverables

- A report (pdf file format):
  - **3** pages (**maximum)**
  - Font 12, single-line spacing paragraphs and **2cm margins**
  - You need to explain the **adopted solution for every question (references to diagrams are allowed & strongly recommended)** & the **main theoretical, conceptual**, & **technical issues** underlying the choice of that solution.
  - For the implemented processes to solve the problems, include in the report only the **details that are impossible to be represented in diagrams**.
  - **Do not include** in the report details related to **map legends and/or labels.**
- **pdf files** (as many as needed) containing the problem 03 map and the **diagrams,** that represent the implemented solutions when required (**use in diagrams the names of the layers included in the zip file**).

Assignment- Input data

- The zip file Assignment2026_data.zip is available at FENIX assignment page, which contains:
  - Territory.gpkg (geoPackage format) including the spatial data sets:
    - River
    - GwPollVulnRegion
    - SoilType
  - Parcels2024.gpkg (geoPackage format) including the spatial data sets:
    - Cadastre
    - EditingZones
    - SoilUse
  - Owners.xls
  - TableSoilUse.xls

Assignment- Goals

- **Problem 01** – The general goal is to determine the regions vulnerable to the flood risk due to river overflow during the rainy season and classify them as high-moderate-low risk.
- **Problem 02** – The general goal is to create a new gds representing the parcels, classified by their soil use. (Each group will use only one region/polygon based on their zone number.)
- **Problem 03** – The goal of Problem 03 is to combine the supplied cadastral data with the parcels mapped by your group in Problem 02 and determine, for each owner, the total area held, the area in each land-use class, and the area for which land-use information is missing
- **Problem 04** – The general goal is to create one gds representing the relative index of susceptibility to groundwater pollution of the region represented in the gds named GwPollVulnRegion.
- **Problem 05** – Here, you will need to be proactive. You will need to identify a problem that should be answered through a spatial analysis, following the given steps.

Assignment- Implementation

- **Problem 01- 04:** You will be provided with specific requirements and steps to follow to reach the solutions to these problems.
- **Problem 05**: You will be provided with steps to guide you in defining and answering your question/problem. The solution to your problem **should require spatial analysis**, and **not simply the spatial representation** of a factor.

Assignment- Implementation

Examples of questions:

- Which municipalities in Portugal increased their cultivated vineyard area between two selected years, and which of those municipalities form contiguous groups?
  - data source: Instituto Nacional de Estatístca, www.ine.pt
  - you can search for equivalent data in the portal of statistics office of your country
- Which countries produce the most cereals in a selected year, and how does their cereal production compare with that of the countries with which they share a land border?
  - data source: FAOSTAT
- Which European cities are in the highest quarter for annual mean PM_{10} concentration in a selected year, and which of those cities are within 100 km of another city in that quarter?
  - data source: EEA

Assignment- general tips

- Ensure that your GIS project opens correctly in a different computer that the one were it was created.
- Use meaningful names for files and attributes, and add a description in the metadata. Names like Layer1, Layer2, ..., are not meaningful.
- Use appropriate symbology for the representation of the spatial information
- In diagrammatic representation:
  - Be consistent in the symbology of representations of datasets or operations
  - Include only what is needed
  - Be explicit, do not leave items or other things for interpretation

Assignment- report tips

- Explain your general strategy and decisions to find a solution to the problem. You can provide a **list of steps**, breaking down your problem
- Provide a **brief analysis of the results** of the respective problem.
- For problem 05, include one **GIS layout figure** in the report, with a caption that answers your question. Cite the data sources.
- If several solutions are possible (tools, analysis paths), **explain your choices**
- **Do not repeat information that is available elsewhere**, either in the data, the GIS project, or diagrams of operations. The exception is if that information was determinant for your choices
- Answer any **specific questions** from the assignment **in the report**
- If **external data sources** were accessed or used, **always cite them** in a correct format.
- **No need to cite the provided data** with the assignment.

Credits

The structure and content of the course, including most of the slides and exercises was developed by Professor Graça Abrantes (SIG 2021_2022) and Professor Rui Figueira (SIG 2023_2024)