Introduction to QGIS 3: Introduction and Preparation

Welcome to the tutorial "Introduction to the Open Source Software QGIS". Before you start with the tutorial take a look to some information. Please read these carefully.

Introduction

Why GIS in class?

In many school subjects there are contents taught, that have a spatial reference. This spatial reference is visualized in a map sometimes, but often not visualized at all. Some students have trouble to recognize the spatial relationships without their visualization. By making computers more powerful and cheaper, the students can also be offered the opportunity to work on projects such as the Matura thesis on computers.

Through the representation of spatial contents with the help of a Geographic Information System (GIS) the students have the possibility to recognize spatial relationships better and also to perform spatial analyses. That’s why the students at grammar school should receive an introduction to the topic "Geographic Information Systems" and get to know the basic functions of a GIS. Therefore, they should have the opportunity to use the program either in class or self-employed for the Matura thesis.

Learning objectives

You should be able to do the following after working through the tutorial:

- Enumerate the functions and components of a GIS.
- Run a small GIS project from the project settings on the collection, management, analysis to the presentation of the data.
- Distinguish raster from vector data and also justify the distinction.
- Create a map and implement the design in GIS.

Workflow

After the QGIS program is installed on the computer and you saved the data for this exercise locally on your computer, you can start by working through the tutorial.

The tutorial is divided into 5 chapters on the following topics:

- What is a Geographic Information System?
- Geodata and spatial reference
- Collection and management of data
- Data analysis
- Presentation and output of data

Each individual chapter is again divided into the following 3 parts: Theory, exercise and chapter test. In the practice section you will get a theoretical introduction to the topic. There, you will have the opportunity to deepen the theoretical knowledge with the help of practical applications. If you think that you understood the content of the chapter, then you can go to the chapter test. This test must be solved without documentation and notes. When you've answered all the questions go with your answers to your teacher or correct your answers yourself with the solution sheet. If your teacher corrects your answers and the answers were right, he'll give you the green light to move on to the next chapter. If you answered a question wrong you have time to go over the theory again and to answer the question again. When the teacher is satisfied with your answer you can move on to the next chapter.

In each chapter you will come across the following symbol again and again: ❗. This sign gives the hint that you need to write something down. So you must always have a piece of paper or a notebook at hand. Read through the question and answer them in writing. When you've answered them you can compare your solution with the solution in the solution sheet.

Here everything once again as a summary:

1. Work through theory
2. Solve an exercise using the QGIS program
3. Solve chapter test
4. Have your answers corrected by the teacher. If green light by teacher, proceed to 5. If answers are incorrect, return to 3.
5. Work through the theory of the next chapter
6. ...

Preparation

Installation of the GIS software QGIS

If you don't work with your own computer at school, ask a teacher if she can install the software on a

computer for you or if it's already installed on a computer, which you could use to work through the tutorial.

If you work with your own computer, you can, depending on how proficient you are with computers, install the QGIS program yourself or ask someone (e.g. your teacher or your parents), if he/she can help you with the installation.

To install new software on a computer, you need administrator rights.

Installing QGIS is not difficult. The program can be downloaded from the following link: http://www.qgis.org/

If the page is displayed in German, you can change the language by clicking on the english flag above right of the homepage. When you click on the "Download Now" button, you get to the side on which the program can be downloaded. QGIS is available for the (64 bit) operating systems Windows, MacOS X and Linux.

Choose the right download for your operating system and download the installation file.

This tutorial was tested with QGIS version 3.2.2 "Bonn". You can download the newest version of QGIS. If there are any problems installing, choose QGIS version 3.4.5 LTR.

An alternative to installing the QGIS software is the learning stick https://lernstick.ch (Currently only QGIS 2.18 is supported on the learning stick).

Download example data

The zip file with the data for the exercises of this guide you'll find on https://www.openschoolmaps.org under teaching materials ("Unterrichtsmaterialien").