

Example of a local application: QGIS

Summer School on Digital Humanities

Course material available at

https://github.com/AugustoCiuffoletti/dhss_2021

Augusto Ciuffoletti

26 maggio 2021

Example of a local application: QGIS

- We see the basic concepts at work
- Quantum GIS (QGIS) is an Open Source GIS application
 - software is developed and maintained by volunteers
 - first release in 2002
- Runs on Windows, Linux, MacOS
- Acquires and aggregates layers from different formats
 - both local data and remote databases
- Lets you create new layers
 - populated with customized features
- In the end you can:
 - produce a **graphic file** (jpg, png etc.)
 - **save** in QGIS format
 - **publish** the map
- It does everything, but expect a steep learning curve

Step by step QGIS tutorial -1

Create a new project

- Open QGIS and select Project-> New

Create a raster background layer

- Ctrl-L -> Browser -> XYZ Tiles
- Double-click on OpenStreetMap
- Use the control pad to focus on a limited region
- Note: Instead of Ctrl-L you can use the *Data source manager* icon in the toolbar

Step by step QGIS tutorial - 2

Define a vector layer

- Layer -> New Vector -> New shapefile
 - or use the *New Shapefile* icon in the toolbar
- Select
 - a filename where to save the layer (e.g., Demo)
 - the features type: *Point*, *Multipoint*, *Line*, *Polygon*
 - in the example that follows we use *Point*
 - a coordinate system (WGS84 EPSG: 4326)
- Add fields for the features in the layer (*New Field* form)
 - when finished hit **Ok**
- The new layer appears in the *Layers Panel*

Step by step QGIS tutorial - 3

Further configuration of a layer

- Double click on the **Demo** layer to set layer properties
 - in *Symbol* set the graphic symbol and its properties
 - in *Labels* select *Single label* and next field to use to label the point on the map
 - in *Fields* update feature fields

Step by step QGIS tutorial - 4

Populate a vector layer (with points)

- Select the **Demo** layer and press the *Pencil* icon in the toolbar
 - a pencil appears in the *Demo* row in the *Layer* panel
- Type **Ctrl+.** to enter new point features
 - the mouse pointer becomes a crosshair
- Move the pointer on the map and click to add a new point feature
 - ...a box appears to set feature attributes
- ... repeat for each point
- To move a point feature **Edit** -> **Move feature** or use the *Vertex tool* in the toolbar
- To exit edit mode, right click again on the **Demo** layer and **Toggle Edit** (the pencil disappears)
 - or use the *Pencil* icon again

Step by step QGIS tutorial - 5

Update feature attributes

- Right click on the **Demo** layer and select **Open attribute table**
 - Bottom right icons to select the view style
- **Ctrl+E** to enable table edit (or click *Pencil* icon)
- Modify one or more attribute values
- **Ctrl+S** to save

Add an attribute ("desc") to the features

- Right click on the **Demo** layer and select **Open attribute table**
 - **Ctrl+W** to add a new attribute
 - Set name and type (e.g., "desc" of type String) for the attribute
 - Double click to set the attribute value (or to modify it)

Step by step QGIS tutorial - 6

Compute fields with point coordinates

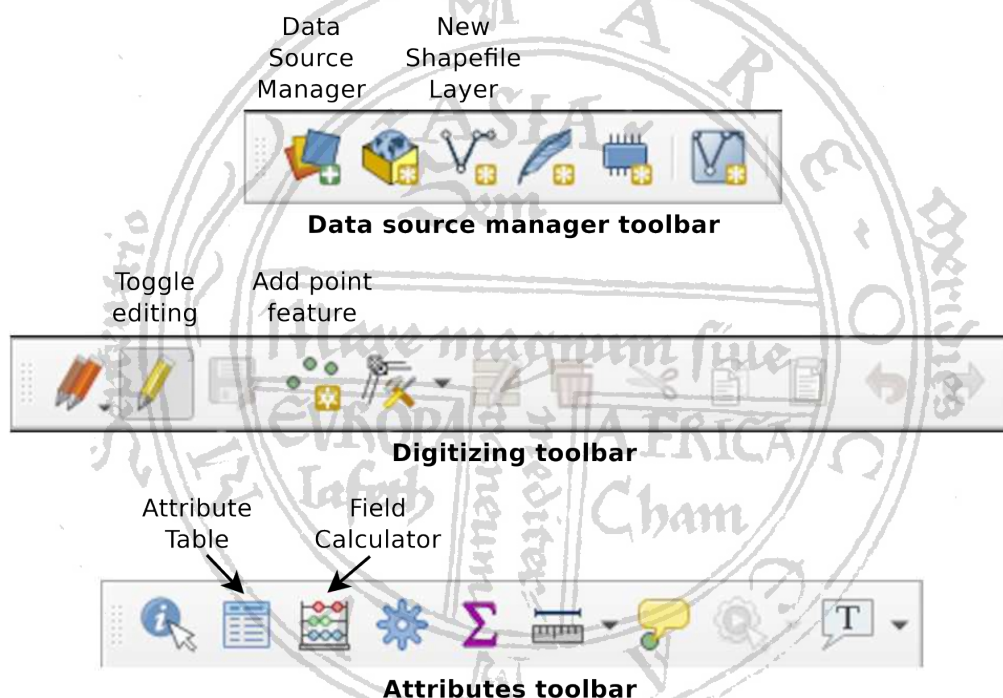
- Select a layer and click the *Open Attribute Table* button in the toolbar
- Select the abacus icon in the attribute table window
- Input a name for the field you want to add (e.g. *Lat*)
- Select a type for the field (e.g. *Real*)
- Type the formula $y(\$geometry)$ in the *Expression* box
- Create another field for the latitude (e.g. *Lat*, $x(\$geometry)$)
- See more functions expanding the *Geometry* drop-down list

Step by step QGIS tutorial - 7

Save your work

- Save the project in qGis native format (Ctrl+S or **Project -> Save**)
- Export as an image (**Project -> Save as Image**)
- Export in a portable vector format (**Project -> Export DXF**)

GUI shortcuts shortform



Lab Activity

- (Basic) North of La Spezia there is a region called "Cinque Terre". The name comes from five fisherman villages: Corniglia, Manarola, Vernazza, Monterosso and Riomaggiore. Set a Point for each of them and show on the map a label with their name.
- (Intermediate) Draw a sea route to visit all villages starting from Levanto (another small town on the north). Convert the line to a new layer of vertices using **Vector** -> **Geometry tools** -> **Extract Vertices** (by the way, you need a permit to do that)
- (Advanced) Compute longitude and latitude of such points, and label each of them with a string "(long, lat)" using the **concat** function in the calculator
-