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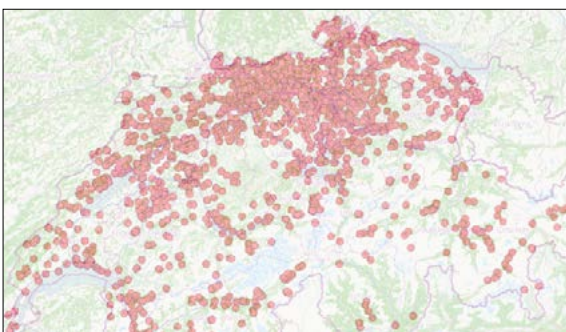# Web Map Tiling Services

Tiny Tile Server

Tiling map

Extracting tooltips

Thematic map about Switzerland

Introduction: This project has been performed with the main objective of displaying local maps in MBTiles format on the internet. This is the purpose of Tiny Tile Server. A website has also been developed with templates showing examples that the final user will only need to adapt. There are also tutorials on how to create your own map. There are already similar related projects with serving tiles stored in an MBTiles file. What makes Tiny Tile Server different is that users do not need to have programming skills, which is why it is simpler and easier to use. Tiny Tile Server could also be used by developers to add new functionalities on it.

Approach/Technologies: Tiny Tile Server extracts the data from the MBTiles file. This is an SQLite database where the map information is stored in tables containing all the tiles, the UTFGrid and metadata. Tiny Tile Server supports two protocols to access the tiles: 1. Direct access with XYZ tile request to tiles in a directory or to the MBTiles database. 2. Web Map Tile Service from an MBTiles database. The front-end is programmed using HTML5, CSS3 and JavaScript. There are also used two libraries specialised in creating maps: Leaflet and OpenLayers. These libraries permit us to display our thematic map on the internet on top of a base layer with topographic information; OpenStreetMap is used for that purpose. They also permit the addition of some functionalities in our map, like zoom, scale and legend. The back-end is written in Python using Bottle as the only external dependency. Bottle is necessary to handle requests/responses to the server, to get and to operate with the variables and to simplify routing.

Result: The website can be used for any kind of users who want to display thematic maps on the internet. The workspace is easy to reproduce and does not need any external reference apart from installing Python. With the templates, which are well documented, the user only needs to change the part of the code to reference the maps. There are also some tutorials to create a map in MBTiles format, in case the user needs this. Tiny Tile Server can be adapted because it is open source, if the user has Python programming knowledge. Further development of Tiny Tile Server could include more protocols like TMS, to explore HTTP caching (and expiring) mechanisms, and to support other coordinate reference systems apart from mercator.