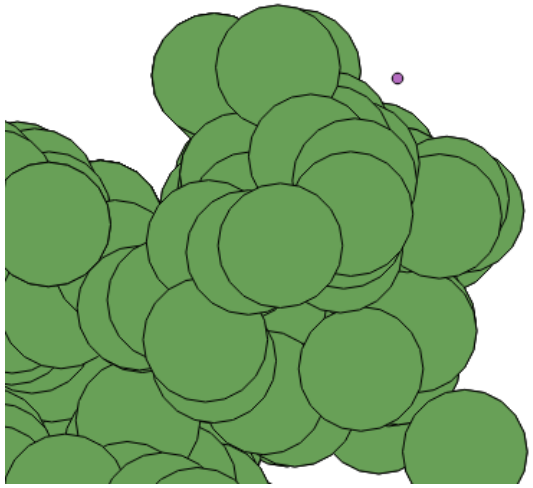
Universität Konstanz

# „Presentation and Analysis of Spatial Data“



# (4) Manipulation of Spatial Data

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# Agenda

1. Change the coordinate system
2. Data manipulation – The field calculator
3. Combine tables and shapefiles
4. Calculate distances
5. Spatial aggregation
6. Export your data

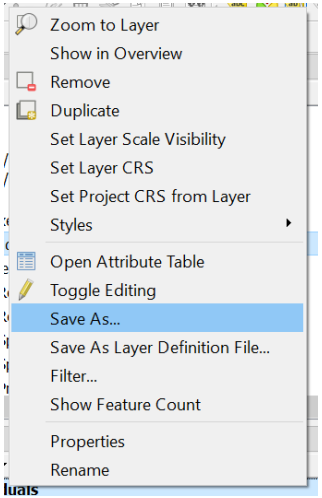
- General Tipps und Tricks as Conclusion-

# 1. Change the coordinate system

- For alle data manipulations and analyses, the GIS has to knwo about the coordinate system of the shapefile. In case several coordinate systems are present in one project, QGIS will tranform them on-the-fly in the coordinate system of the first shapefile you added.
- Better: transform all shapefiles in the same standard
- Better: projected coordinate system (two-dimensional)

→ Save as new shapefile and specify the standard coordinate system

1.

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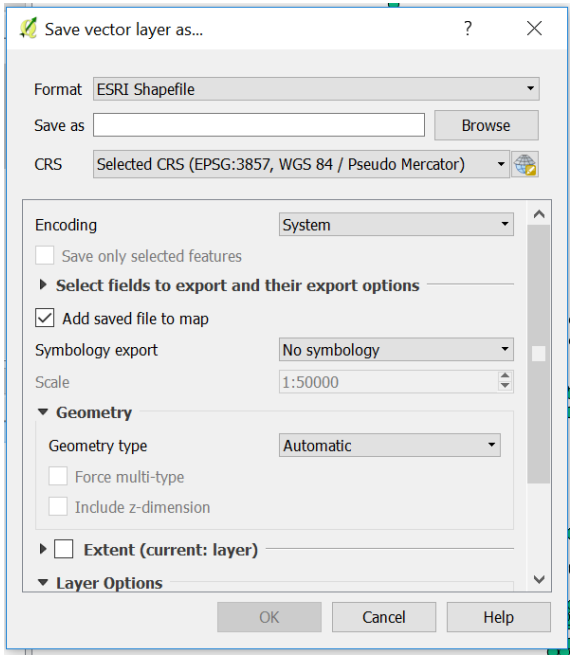


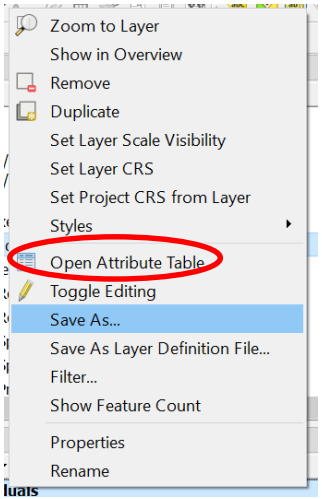
# 2. Data manipulation– Field calculator

You can manipulate data directly in the GIS program. You can generate calculate variables (fields).

→ Open the „Attribute Table“

→ Open the „Field calculator“

1.

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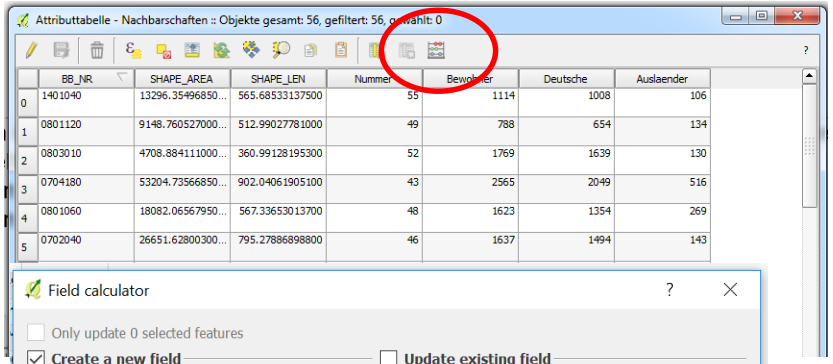


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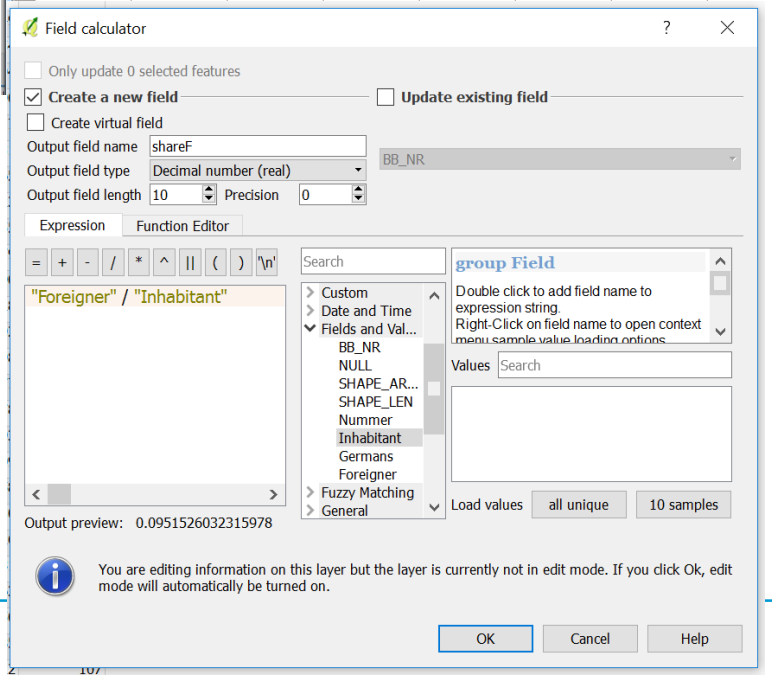


# 3. Joining Tables and Shapefile

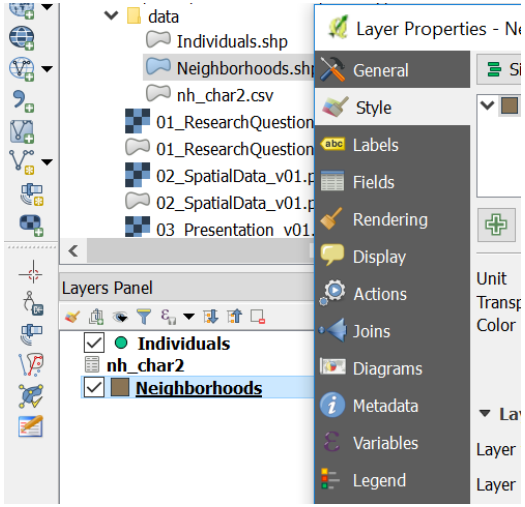
- Fields of a Table can be combined with Shapefiles.
- This requires an Identifier.

→ Add Table as Layer (→ „Layer“, → „Add Layer…“, → „Add delimited text layer…“)

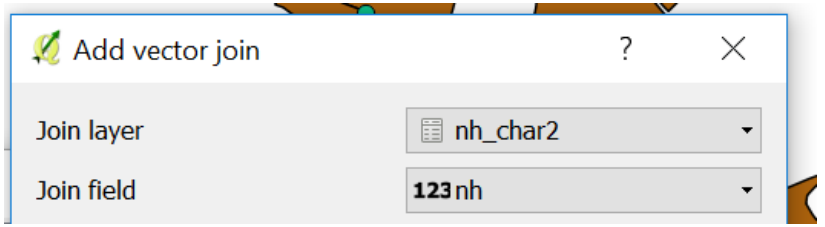
→ Add Shapefile

→ „Properties“ of the Shapefile, „Join“ with Table (+)

1.




2.




- The Join is not permanently. Save Shapefile to make it permanent.
- You can manipulate the field names with the extension „TableManager“.

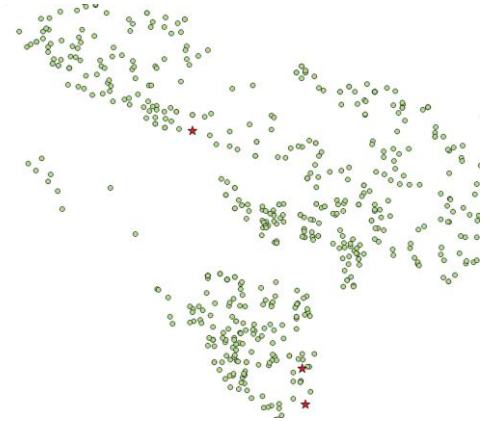
# 4. Calculate distances

**Distances are an important determinet of social action an can be calculated with a GIS.**

Example: How far do the respondents live away from the next cinema (Kino)?

→ „Vector“, → „Analysis Tools“, → „Distance Matrix“

1.



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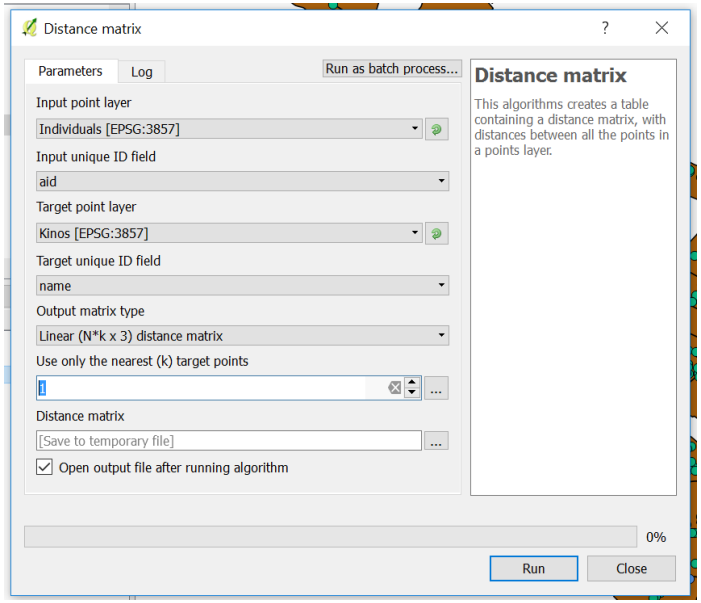



→ You can merge the resulting distance matrix to the shapefile

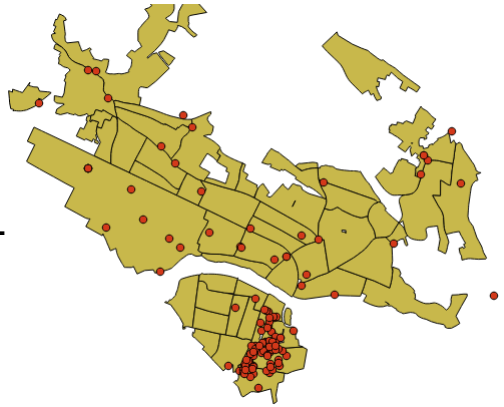
# 5. Spatial aggregation

**1. A GIS can aggregate point-data. The units are defined by a Polygon-Shapefile.**

Example: How many respondents are in each neighborhood?

(How many crimes in each district? How many schools in each city? …)

1



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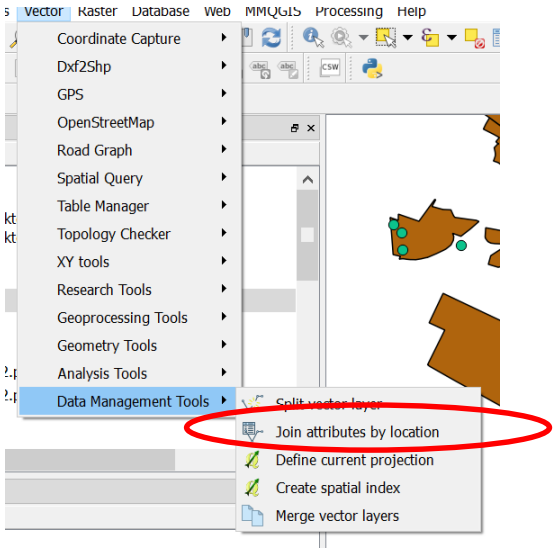


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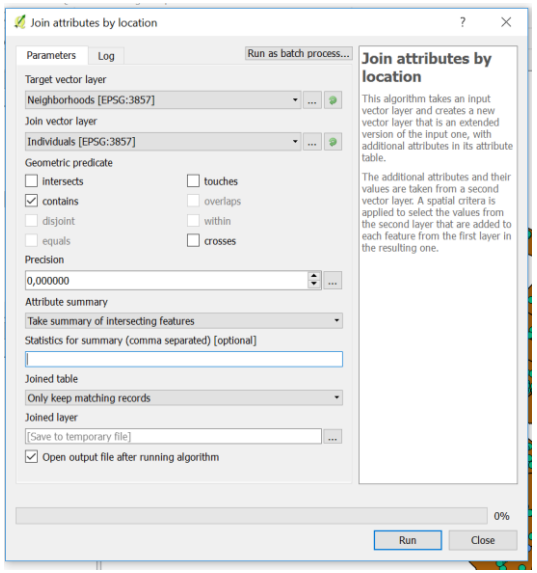


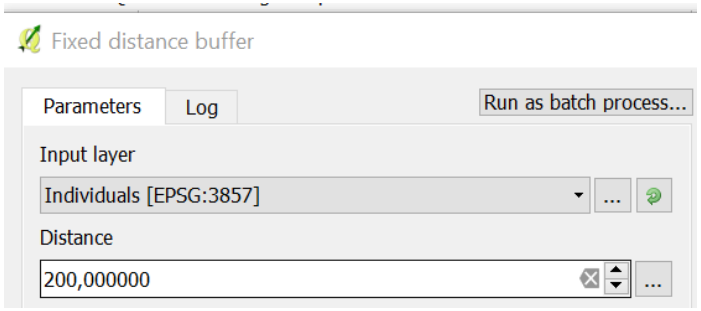

– Use „TableManager“ again to rename the field

# 5. Spatial aggregation

## 2. You can use this kind of aggregation to generate individual neighborhoods.

Example: How many pubs are within a maximal distance of 200m of any respondent?
→ „Vector“, → „Geoprocessing Tools“, → Fixed distance buffer“

1.

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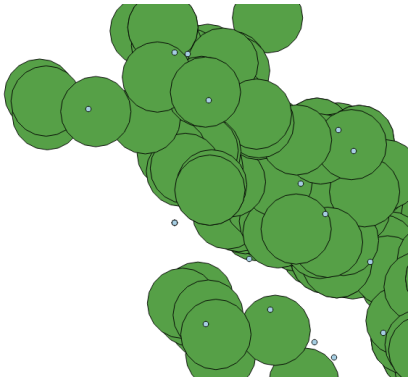

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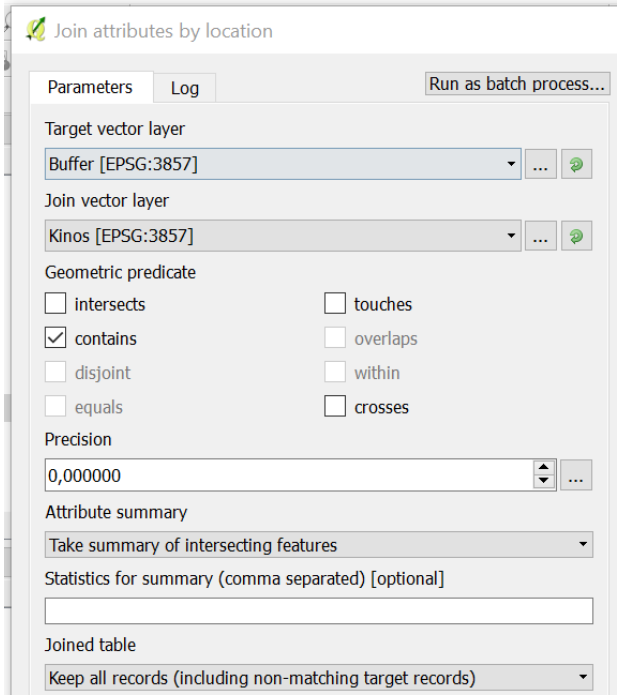


# 6. Export your data

**Export your data for further analysis:**

- **Usually as csv-file**
- **Also possible as Excel-file (with the extension „XY-Tools“)**

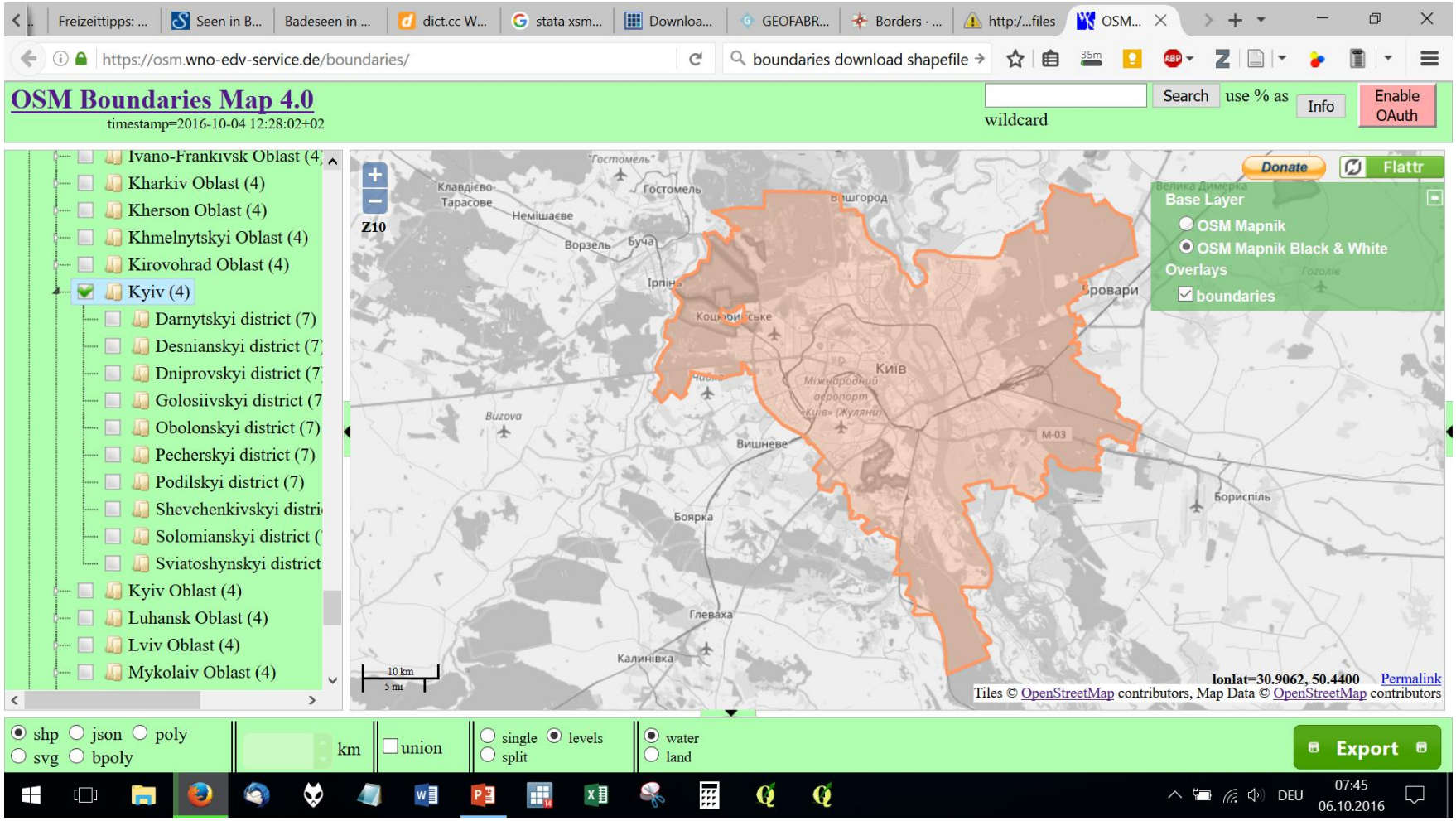
→ Right-click on the shapefile you wish to export
→ „Save as …“
→ Select „Format“ CSV
→ Choose the folder where to save the file

(in order to be able to use polygons in spatial statistical analyses you need to calculate the centroids, → „Vector“, → „Geometry Tools“, → „Polygon centroids“)
(GeoDA, Stata und R can also read Shapefiles)

# - General Tipps und Tricks as Conclusion-

- Non-english characters can lead to problems
- Missing values can lead to problem
- Having not all Layers in the same coordinate system can lead to problems
- Alway check your results on a random basis
- Learn Python if you are interested in geodata

# - Sources of Shapefiles-



# - Sources of Shapefiles-

https://osm.wno-edv-service.de/boundaries/

http://www.statsilk.com/maps/download-free-shapefile-maps

https://mapzen.com/data/borders/

https://osm.wno-edv-service.de/boundaries/

www.gadm.org

http://www.igismap.com/download-free-shapefile-maps/

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# Thanks for Your Attention!

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