# Assignment: Use your own GIS data – Schelling model

Spatial Simulation is an explicit strongpoint of the GAMA modelling platform. This relates to the ease of loading GIS data, the rich functionality of spatial operators and spatial analysis and finally the possibilities of dynamic geovisualisation together with visual analytics capabilities. Therefore, GAMA is especially well suited to simulate real-world scenarios that are based on GIS data.

## Your task

The model that you will work with in this assignment is an existing model on urban segregation from the GAMA model library. In the model agents move houses according to their neighbourhood preferences. You will replace the underlying GIS data of buildings that are provided in the library with your own data from OSM. This model is an excellent example for GAMAs strong capabilities in working with GIS data.

## Instructions

1. *Open the GAMA model*

   Navigate to the following path to open the Schelling model:

   - Library models >Toy Models > Segregation > models > Segregation (GIS)

   To run the model, double click on the “Segregation (GIS).gaml” model file. On the top of the editing panel, you will now see a green button “schelling”. Click on it to open the simulation (called *experiment* in GAMA) and run it with the start button icon.

2. *Import the Schelling model into your workspace*

   In order to keep the original model in the library unchanged, you need to copy it into your own workspace before you modify anything. To do so,

   - create a new GAMA project and call it “UNIGIS models”.
     In GAMA, *projects* organise models of the same topic under the same root. Any project and any model that you create in GAMA will be located under ‘user models’ in your own workspace, whereas GAMA library models are located in the GAMA program folder under:

     GAMA > plugins > msi.gama.models > models

   - Copy and paste the “Segregation (Schelling)” project with its 5 models from the Library into your ‘UNIGIS models’ project. After you have finished this

module, all assignment models will be organised under the 'UNIGIS models' project.
- Finally, you can delete the other models in the model folder of the Segregation project in your workspace (the Segregation models based on Agents, Cellular Automata and Google Maps), because we only need the GIS-based segregation model for this assignment.
- Run the simulation (called experiment in GAMA) to check, whether everything works.

3. *Prepare and load your own GIS data*

   Download OSM building data with help of Openstreetmap's Overpass API.

   - Open https://overpass-turbo.eu/
   - Navigate to an area in your home town or a city close to you (about 2 x 2 km of an urban area)
   - In the editor paste the following overpass query:

```
[out:json][timeout:30];(
way["building"]({{bbox}});
relation["building"]["type"="multipolygon"]({{bbox}});
);out;>;out qt;
```

   - Run the script
   - Export the data as GeoJson
   - Load the data into QGIS,
   - project it to an adequate planimetric projection and
   - save it in .shp format
   - Place the shapefiles into the *gis* folder of your model and adapt the file name in the model accordingly.

4. *Run the model*

   Execute the model to test, whether it works with your data.

**Submit**

1. A report with a screenshot of the simulation of your own data and briefly (one paragraph) document your study area and the model outcomes.
2. The model as part of a .zip file of the 'UNIGIS models' project that you create at the end of this module and that includes all assignment models.