Spatial Agglomeration of Economic Activity

With SPAG package

Cheat Sheet

Data format

The SPAG function calculates index of spatial agglomeration for economic activity based on two datasets – **data .frame** with information regarding the companies and a **SpatialPolygonsDataFrame** with the map of the area on which the companies are located.

Data Frame

The data frame with information regarding the companies consists of four columns - the geographical coordinates of the company, the number of people employed there and the a column with information regarding the industry category:

CompaniesPoland

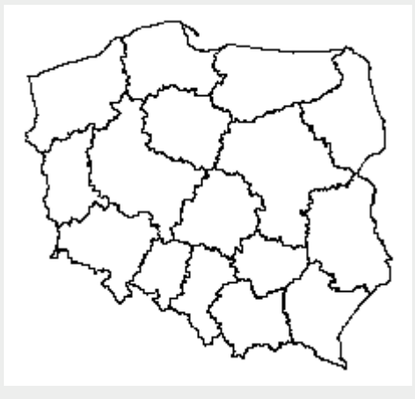
lng	lat	emp	categ
15.41961	51.32673	13	gimn.
15.39025	51.47620	23	gimn.
15.39025	51.47620	21	SP
15.76094	51.35621	25	SP
15.76094	51.35621	14	gimn.
15.48748	51.20189	4	SP
15.59984	51.39110	6	SP

Map

The maps are preserved with spatial polygons package. Given a Spatial Polygons Data Frame or a SpatialPolygons object, the map can be plotted by simply using the plot function :

```
plot(MapPoland)
```

Resulting in the following map:



Loading the map

Map format

Official maps are available in multiple formats, one of them being shapefile. Rgdal package provides provides a function - readOGR - that enables the user to load them as a SpatialPolygon into R:

```
MapPoland <- readOGR("full_directory", "layer_name")
```

Maps can be specified in different coordinate system. In order to check the system a given map uses check the proj4string slot:

ShapefilePoland@proj4string

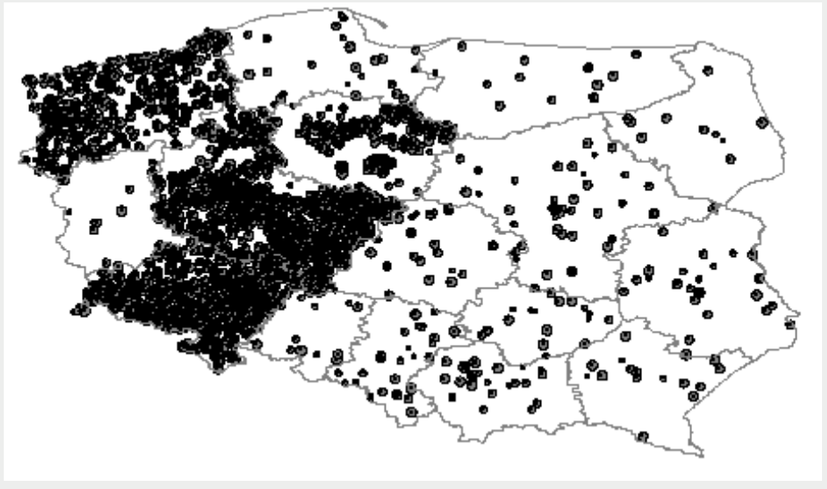
The SPAG function takes a parameter - CRSProjection– that transforms the input map to a different coordinate system (compliant with EPSG). For example:

```
Index <- SPAG(CompaniesPoland, MapPoland, CRSProjection= "new_projection")
```

SPAG Function

The SPAG package provides an interface for calculating the SPAG index. This can be done using the following function:

```
SPAGIndex <- SPAG(CompaniesPoland, MapPoland)
plot(SPAGIndex)
```



The package calculates three components of the SPAG Index – the Distance, Overlap and Coverage Index:

```
print(SPAGIndex)
```

categories	IDist	IOver	ICov	ISPAG
gimn.	0.5871834	0.2970703	0.2537445603	0.044261860
SP	0.6301239	0.3249807	0.4299286509	0.088039969
LO	0.5348324	0.2305102	0.1515661370	0.018685729
T	0.5477285	0.2587197	0.0859857302	0.012184880
TU	0.5009985	0.2843701	0.0223914584	0.003190089
LOU	0.5190096	0.2772326	0.0356745269	0.005133078
LP	0.4991059	0.3036286	0.0206077320	0.003122954
ZZ	0.0000000	1.0000000	0.0001012043	0.000000000
Total	0.5882417	0.2396642	1.0000000000	0.140980461