**„On the path to the georevolution in Krakow – making data more accessible”**

If you want to be a part of a rapidly changing reality and help the City create new databases and thus contribute to the Digital Interactive City Plan, come and create a tool that will automatically GEOCODE your data and power up OBSERVATORIUM the City Map Service. Databases with spatial attributes are extremely valuable and can be used in many mobile applications e.g. jakdojade.pl, Planer, Navigation to the Point and many more ...

**Issues:**

In our daily work we use huge amounts of data, which are stored in various text files and spreadsheets. Data sets describe, among others, Krakow’s current and past socio-economic situation. These data are very important for city management - but without the standardized format, "common denominator," it is not possible to compare multiple datasets, draw conclusions, or forecast trends. The point of reference for data sets can be their spatial format, that is, saving data with geographic coordinates. We therefore need a GEOCODER - a tool that will help fully automate the process of proper data (processing and processing) processing and analysis, thus enabling the development of spatial databases. Based on such resources, it is possible to manage the city more efficiently, and it is also an important step towards OPEN DATA and making it available to residents via the internet platform.

**Road safety!**

HackYeah participants will work on real data from the institutions responsible for security. Data on car accidents in Krakow are prepared especially for you to work with it! In the "CITY" track you can contribute to raising the level of security in the city by suggesting the use of data analysis. Thanks to your solutions, Krakow will get a spatial view of when and how many car accidents have occurred, and this will make spatial analyses easier! You can contribute significantly to safety on Krakow roads! It’s not ending with working on the tool and using real data. You will have an opportunity to see how many factors and dependencies determine the functioning of the city and influence the effective response to the challenges it faces. Feeling an active and responsible Krakow citizen? Then you know what to work on!:)

**Definitions:**

Spatial data, also known as geospatial data, is information about a physical object that can be represented by numerical values in a geographic [coordinate](http://whatis.techtarget.com/definition/coordinates) system. Generally speaking, spatial data represents the location, size and shape of an object on planet Earth such as a building, lake, mountain or township. Spatial data may also include attributes that provide more information about the entity that is being represented. [Geographic Information Systems (GIS)](http://searchsqlserver.techtarget.com/definition/GIS) or other specialized software applications can be used to access, [visualize](http://searchbusinessanalytics.techtarget.com/definition/data-visualization), manipulate and analyze geospatial data.

**Geocoding** is the [computational](https://en.wikipedia.org/wiki/Computational" \o "Computational) process of transforming a [postal address](https://en.wikipedia.org/wiki/Address_(geography)" \o "Address (geography)) description to a [location](https://en.wikipedia.org/wiki/Location_(geography)" \o "Location (geography)) on the Earth's surface (spatial representation in numerical coordinates). [Reverse geocoding](https://en.wikipedia.org/wiki/Reverse_geocoding" \o "Reverse geocoding), on the other hand, converts [geographic coordinates](https://en.wikipedia.org/wiki/Geographic_coordinates" \o "Geographic coordinates) to a description of a location, usually the name of a place or an addressable location. Geocoding relies on a computer representation of address points, the street / road network, together with postal and administrative boundaries.

**OBSERWATORIUM** - <http://obserwatorium.um.krakow.pl> Map service for inhabitant

**What needs to be done?   
Functional requirements for the application:**

**Input data:**

1. Geocoding data: A working CSV file containing street names, address numbers, and other attributes.
2. Address Dictionary: An XLS file containing street names, address numbers and X, Y, and CODE TERMS according to which the jury will evaluate the correctness of the program.
3. Dictionary of streets TERYT for possible use in the program.

**1st phase – task completion (required)**

1. Create graphical user interface (desktop application or web application)
2. Application should allow to load input data from CSV text file (encoded in UTF-8), that can contain undefined number of columns. First row will contain column labels.
3. After data load, the application should allow choosing which columns describe addresses. The choice should be done by clicking on the desired column(s). The input data file can contain address information in a single column (‘street-name street-number’) as well as in separate columns (‘street-name’, ‘street-number’.
4. At the end of the operation, the program informs you of the end of the operation by means of a screen message and a beep.

**Result data:**

1. The CSV file (UTF-8 encoding page), which will contain the data contained in the input file that the program considers to be correctly geocoded, expanded by two columns defining the X, Y coordinates in PL-2000 zone 7.
2. The CSV file (UTF-8 encoding page) that will contain the data contained in the input file that the program was unable to assign to the X, Y coordinates.
3. Once the geocoding is completed, the application must generate an activity report (TXT file) that should contain:

• the date and time of the geocoding process (to 1 second)

• date and time of completion of the geocoding process (within 1 second)

• geocoding time in seconds

• number of matched records

• the number of mismatched records

**All the input data needs to be preserved in the output file.**

**2nd phase – testing platform**

1. The organizer will provide access to the testing platform – ArcGIS online

ArcGIS Online (AGOL) is a collaborative GIS web service, that allows the users to use maps, scenes, apps, analysis layers and data, as well as their creation and sharing. ArcGIS Online is a service that enables its users to explore the data, create maps and share narratives.

The platform is available under the following links:

https://www.arcgis.com

<http://umkrakow.maps.arcgis.com/home/webmap/viewer.html?useExisting=1>

In order to access the platform, please contact our team.

**3rd phase – evaluation by the Jury:**

1. Jury will evaluate the task completion as described in City Path Statute as well as:
   1. Correctness of the geocoding.
   2. Success rate (how many rows were successfully geocoded).
   3. Time taken to geocode input file.

**The organizer allows following solutions:**

1. Based on the provided by the organizer base address file (XY)
2. Based on publicly accessible non-commercial APIs (e.g. OpenStreetMap, ESRI, etc)

**Documentation:**

<https://developers.arcgis.com/documentation/>

<http://doc.arcgis.com/en/arcgis-online/>