Task 1: Generation of a Internal Representation of a Graph with Geographical Data from OSM

Escuela Superior de Informatica de Ciudad Real

Universidad de Castilla-La Mancha. 2018/2019

September 2018

Laboratory Main Goal

To obtain an optimal route for a vehicle that circulates through a set of places of a town.

It is needed:

- **Geographical data** $\Rightarrow$ Downloaded from OpenStreetMap (OSM).
  - **Link:** https://www.openstreetmap.org
  - **Information:** Nodes, way, relations.
  - **Representation structure:** file XML.

- **Town Graph:**
  - Simplification of topology and basic information
  - Graph saved in format **graphml** (http://graphml.graphdrawing.org/), using some library like **osmnx**.

Task Goals I

Goals: Given a file in format grahml, the students must write a class "Graph" containing:

- A **constructor**, that receives as parameter the name of the file graphml:
- **Methods**:
  - **BelongNode**:
    - input: id of an osm node.
    - output: True (if it belongs to the graph) or False (in other case)

Task Goals II

- **positionNode**
  - input: id of an osm node
  - output: longitude y latitude of such node or error if it does not exist.
- **adjacentNode**
  - Input: id of an osm node
  - Output: list of the arcs from the node (adjacency list) where an arc comes defined by the origin node, the destination node, a length and the name of the street.

Link to the graphml files

https://drive.google.com/drive/folders/1nXPVVJ0E44osD8C

Deadline for delivery: **October 5th**

- **Source code**. Each team will create a private code **repository**, named like the assigned team (e. g. $A1-07$ for team 7 in Lab Group A1). The repository will be **github** or **bitbucket**, where all code and documentation of practice will be stored and updated. The **teacher** will be **invited** as another member of the team (**Github user: lrbenitez**)
- **Documentation**. A **doc.pdf** document with the structures of the created artifacts and a **justification** for them, as well as the name of all **equipment** components and the name of the repository. This document will be **uploaded** to Moodle.