

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

Escuela Superior de Informatica de Ciudad Real

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1 Introduction

2 Software Requirements Specification

3 Submission of Results

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** ⇒ 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 graphml, 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/1nXPVVJ0E44osD80>



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: Irbenitez**)
- **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.