Brief Doc for database

Drafted by DJ in 12/11/2019

It is very inconvenient and difficult for libosmium to store in the ram, I decided to build a much simpler database for data access. And just use the libosmium to read the file.

Dependency

Check what is needed for libosmium. All other codes are only using STL.

Basic concept for class

class Model

Top level class for data manipulation. It is used for loading the file and storing the data. Other parts of this project will access data through this class.

Functions

The code is extremely simple to understand. So I am not explaining in this part.

Except:

- void loadFile();
  Use libosmium to read the data from the pbf file.

class ModelData

A class contains all the osm data.

Member

- m_NodeLocation: Containing all the locations in longitude and latitude, u can accessing by node id. Built from osmium::flex_mem. Using osm::location to contain the lon&lat as int32_t.
- m_NodeMap: Containing the tags list in a node(if it has). Note: if a node doesn't have tags, u just can't find it here. You can use id to access all the m_*Map member in this class. And they are all built from STL map
- m_WayMap: Containng the nodes list and the tags list of the way object in osm file.
- m_RelationMap: Containing the member list and tags list

class ModelDataHandler

using the osm to read the file and store the data, no need to understand this for data access. We won't have other usage for this now.

Data Structure

ModelDataStructure.h

- nodeData:
  - tagList: using std::pair to group up the tag key and tag value.

```
tag = NodeData.tagList[0];
tag.first;    // for tag key
tag.second;   // for tag value
```

- wayData:
  - tagList
  - nodeRefList: containing a list of node of this way using std::vector. the list is in the same order of that in the osm file. storing as osmium::unsigned_object_id_type. You can use this directly to index it's location in m_NodeLocation.
- relationData:
  - tagList
  - memberList: containing a list of member using std::vector.
- relationMember:
  - type: uint16_t value, check what it means at the comment of the code.
  - role: string
  - ref: osmium::unsigned_object_id_type

Notes for nodeLocation

Use osmium::Location for lon & lat(int32_t for both)