Take-home Exercise 3: GIS-based Network Accessibility Analysis

This handout provides the context, the task, the expectation and the grading criteria of Take-home Exercise 3. Students must review and understand them before getting started with the take-home exercise.

Setting the scene

Geographical accessibility is an important issue for the sustainable development of cities. In this take-home exercise, you are required to apply GIS-based network accessibility analysis approach to assess accessibility to community facilities in Singapore by using publicly available data.

The Tasks

The specific tasks of the study are as follow:

- derive a hexagon layer (500m by 500m) from Planning Subzone layer. The hexagon layer should exclude all the outer island including Pulau Ubin and Pulau Tekong.,
- compute nearest distance from the centroid of each hexagon to the following social services:
  - eldercare (driving),
  - CHAS clinic (driving),
  - primary school (driving).
  - childcare (walking),
  - kindergarten (walking),
- using appropriate thematic mapping technique, prepare a series of thematic maps showing accessibility of the community services above,
- using appropriate statistical method(s) provided by QGIS, prepare a composite accessibility layer by combining these five layers,

- plot appropriate statistics graphics to complement the GIS maps analysis, and
- Critically discuss the geographical patterns revealed by the maps and statistical graphs.

Take-home Exercise Artefact

GIS data repository

The GIS repository includes but not limited to geospatial data compiled and derived, QGIS project file and data dictionary. It must be in a single zipped file (i.e. .zip). The geospatial data must be stored in a GeoPackage database format. The data dictionary can be in either MS Word document or edited into the GIS data.The project artefact must be uploaded onto eLearn.

Take-home Exercise Report

You are required to edit your take-home exercise report in MS Word format. The take-home exercise report, beside others, should include all the thematic and choropleth maps prepared and their respective discussion.

More importantly, the report must provide a **reproducible** step-by-step guide on the following process:

- data compilation, extraction and integration,
- data cleaning, preparation and wrangling,
- GIS analysis (including tabular and graphical analysis), and
- GIS maps design.

> *Note: **Reproducible** means that readers are able to perform the same analysis and obtain similar results by using the same data sets and by following the step-by-step guide.*

The title of the report should be in the form of *SMT201_AY2021-22T1_Ex3*.

> *Note: This is an individual exercise. You are required to work on the take home exercise and prepare submission individually.*

Grading

- Quality of the GIS data model built (including metadata) (20 marks),
- Appropriateness of the GIS methods used (20 marks),

- Quality of GIS maps prepared (20 marks),
- Reproducibility of the GIS processes (20 marks), and
- Ability to provide correct interpretation and discussion of the analysis results (20 marks).

Submission Date

The take-home exercise artefact must be uploaded onto eLearn by the submission deadline stated below.

Due Date: 7th November 2021 (Sunday), 11:59pm (mid-night).