CSE2DBF and CSE4DBF 2021

Assignment 1 – Part 1 (10%)

Due date: 09.00PM 20 January 2021

AIMS AND OBJECTIVES:

- ✓ to represent a problem description given in natural language as an (Enhanced) Entity-Relationship model

This is an individual Assignment. You are not permitted to work as a group when writing this assignment.

Copying, Plagiarism: Plagiarism is the submission of somebody else's work in a manner that gives the impression that the work is your own. The Department of Computer Science and Information Technology treats plagiarism very seriously. When it is detected, penalties are strictly imposed.

No extensions will be given: Penalties are applied to late assignments (5% of total assignment mark given is deducted per day, accepted up to 5 days after the due date only). If there are circumstances that prevent the assignment being submitted on time, an application for special consideration may be made. See Student Handbook for details. Note that delays caused by computer downtime cannot be accepted as a valid reason for a late submission without penalty. Students must plan their work to allow for both scheduled and unscheduled downtime.

SUBMISSION GUIDELINES:

This assignment is to be submitted in soft-copy (either PDF or JPEG) format using the submission link on LMS, by 09:00 PM Wednesday January 20th, 2021. The submission link can be found under "Assignment 1 – Part 1" on the subject's LMS page.

SUBMISSION CHECKLIST:

- ✓ Your (Enhanced) Entity-Relationship Model (EER) for the proposed database

Students are referred to the Department of Computer Science and Information Technology's Handbook and policy documents with regard to plagiarism and assignment return, and also to the section of 'Academic Integrity' on the subject learning guide.

PROBLEM DESCRIPTION:

MapOnMe Database

MapOnMe(MOM) is a company that aims to provide a local spatial data that can be used to analyse urban movement behaviour. For this purpose, this company provides a system where the map data is manually inserted by their staffs and trajectory data are obtained from public contributors. A trajectory is a time series of visited location point that shows a user movement in a specific of time window. A trajectory may contain numerous of trajectory points, however in some rare cases, a trajectory may consist no trajectory points at all.

For the map data, the entry is manually inserted or updated by the administrator. A spatial object can be modified several times by different administrators. For historical purposes reason, the updated date and reason must be recorded for any objects added/modified by the administrators. There are three types of objects in map data, which are **Point** Data, **Road** Data and **Region** Data. Each object will have a unique object identifier called "objectID". A Point data shows a location for an object such as **Restaurant**, **Shop**, **Education** or **Public Service**. Any other type of objects will be classified as **Others**. A Point may have multiple classifications. For example, a shop may have a restaurant in it. Each Point object will have a specific object name and the Geolocation coordinate that contains a pair of Latitude and Longitude values.

A Road object is the road in the local area that might be classified as **Highway**, **Primary**, **Residential** or **Footpath**. Highway is a road normally with 2 or more running lanes plus emergency hard shoulder. This type of road is usually used to connect metropolitan area with regional area. Primary road is the main road in an area. The Residential road is the road that located in residential area which serves as an access to housing, without function of connecting settlements. The Footpath is a road restricted to pedestrian and bicycle access. Each Road entry must have road name and road length in Km. A road data is represented as **a specific sequence of coordinate list**.
The Region data is used to represent Region in the local area. The Region data has region name, area size in SqKm and **a specific sequence of coordinate list as a closed loop**.

A member must be registered in the system by providing preferred memberID, email and name. The date and time when a member joins as user are obtained automatically during registration. The Administrators are staffs in this company that have modification right to insert, update or delete the spatial objects. The administrators are identified by their adminID, email and name.
To submit their own trajectory data, a user or an administrator must be recognized as Contributor. Only contributors can submit trajectories. Not all administrators or users are considered as contributors. Contributors will gain points for trajectories submitted to the system.

When submitting the trajectory data, an automatic TrajID will be assigned to the trajectory. The member must provide the date when the trip trajectory was done. The time when a member submits the trajectory will be obtained automatically. The trip duration and trip distance will be calculated automatically based on the trajectory points provided by the member.

TASKS:

You are required to develop an **EER model** for the above problem description. The EER should contain all necessary information such as entities, attributes, primary keys, relationships (including specialization/generalization if any), cardinalities, and participation (including (min, max)). All specialization/generalization and union type must be represented accordingly, instead being treated as simple association relationships. Any assumptions should also be stated clearly. If assumptions are made, it is important to make sure that the assumptions reflect possible real practice for a particular industry and do not contradict with the problem description above. **Assignment should be typed, not written/drawn by hand. Use any software to draw figures in your assignment.**

[100%]

Appendix A: Spatial Object Registration/Modification Form

Spatial Object Registration/Modification Form

Object ID :

Object Type : ☐ Point ☐ Road ☐ Polygon

Point Data Registration

POI Name :

POI Type (Check all that apply) :

☐ Restaurant ☐ Shop ☐ Education

☐ Public Service ☐ Others

Road Data Registration

Road Name :

Road Type :

☐ Highway ☐ Primary

☐ Residential ☐ Footpath

Road Length : Km

Suburb Data Registration

Suburb Name :

Area Size : KmSquare

Coordinate List ((Latitude, Longitude) In order):
For Point object, put the coordinate in the first entry only
1. (……,……)
2. (……,……)
3. (……,……)
4. (……,……)
5. (……,……)
6. (……,……)

Administrator ID :

Email (new Admin Only) :

Name (new Admin Only) :

Modification Date/Time :

Modification Reason :

Appendix B: Registration Form

Registration Form
Member ID : Email (new member): Name (new member): Join Date (new mem):

Appendix C: Submission Form

Submission Form

Trajectory ID :

Trajectory Date :

Trip Duration : …. h : ….. m : …… s

Trip Distance : ……. Km

Trajectory Points

Timestamp	Latitude	Longitude

Submitted By

Administrator ID :
Or
Member ID :

Contributor ID : Contribution Points :

Submission Date :