Homework Assignment #1

(Due: Monday Oct 16, 2023 to submit via Blackboard System)

Question A. (60 marks)

1) ABC Courier Company provides fast deliveries of packages. For good services, the company needs to have its up-to-date information on the processing and current location of each package. When a customer (e.g. Peter) requires a delivery service, Peter brings a package at a service centre. Then, Peter provides his name, service mode (i.e. fast, regular) and mobile number. Packages can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Also, he pays a fee based on the service mode and the weight of his package. The service centres are characterized by their types, unique centre numbers, and addresses. Packages make their way to their destination one or more transportation arrangements (i.e., train, van, truck deliveries). These transportation arrangements are characterized by a unique shipNumber, a type (e.g, train, van, truck), and a completion timestamp. Design an ER schema for this application, stating any extra assumptions you have like to make. [30 marks]

2) For your ER diagram given above, convert it into a relational schema using the mapping guidelines discussed in the lecture. For each relation (table) obtained, specify the name and its attributes, as well as its primary key and foreign key(s). [30 marks]

Question B. (40 marks)

Data.One is the Hong Kong Government Open Data portal. It has included many datasets available. Amongst health datasets, the influenza surveillance data including sentinel surveillance, laboratory surveillance, influenza-like illness outbreak, hospital surveillance and severe influenza case during influenza season.

Formulate and test in ORACLE SQL the following SQL statements (e.g. CREATE, INSERT, SELECT), and save your answer into a file. Test out the answers on the Oracle DBMS first before uploading the file to the BB System.

1) Define the database schema based on the dictionary of the influenza surveillance data (https://www.chp.gov.hk/files/pdf/flux_spec_en.pdf). [8 marks]
2) Load the dataset from Data.One (https://data.gov.hk/en-data/dataset/hk-dh-chpsebcddr-flu-express). [7 marks]
3) Find the unique weeks which the months of starting date (FROM) and ending date (TO) are different. (e.g. FROM: 29/12/2013 and TO: 4/1/2014 => Week: 1) [5 marks]
4) Find out the years and weeks which H1 (number of positive detections of influenza A(H1) virus) and B (number of positive detections of influenza B virus) are both above 50. [5 marks]
5) Find all years and their averages of H1 except Week 5 nor Week 12. List the results in the ascending order of the averages of H1. [5 marks]
6) Find weeks and the total of H1 across all years except 2016 nor 2019 when the total of H1 is more than 200. [5 marks]
7) Find the weeks which have more H1 than every week in 2016 and 2019. [5 marks]

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*Remark: Please remember to include your name and student ID# in each of your answer sheets for Question A; upload a scanned copy of your answers.