NYU – TANDON SCHOOL OF ENGINEERING
CS-GY 6083 - B, Spring 2022
Principles of Database Systems
Project Part 1: 100 points with 15% weight

In this first part of the project, you will focus on designing a suitable relational database schema that can be used to store the data in the system. In the second part of the project, you will then build a web-accessible frontend that will allow users to use the service via their browsers. Note that the second part of the project builds on top of this first part so you cannot skip this project part 1. You will not be allowed to change your team partner between project part 1 and project part 2.

Project Guidelines: In this first part of the project, using Oracle Data Modeler you will design the relational database that stores all the data about business case detailed below. You should use your own database system (preferably MySQL) on your laptop or an internet-accessible server. Following is the business case and a list of steps for this part of the project. Note that in this first part, you will ONLY deal with the database side of this project and a suitable web interface will be designed in the second project. All tables should have initial of team members as prefix, e.g. ABC_CUSTOMER, where A, B, C is the first character of team members first name.

Business Case:

WOW (World On Wheels) is a car rental company. WOW has many locations at various airports, towns, and cities in the United States. With growth of the business and to efficiently manage its business, WOW intends to convert its file system base isolated data management to sophisticated centralized database system. The business team of WOW has provided the following details and business rules.

a)
Each office location of WOW maintains various classes of rental vehicles. Each vehicle is identified by Make, Model, Year, VIN (Vehicle Identification Number), and License Plate number.

b)
Each location has various classes of vehicle such as small car, mid-size car, luxury car, SUV, Premium SUV, Mini Van, and Station Wagon etc. Each class has its own rental rate per day of the rental service and fees for over mileage (if rental service exceeds odometer limits/day). For example, a rental car service of a mid-size car has daily rate of service as $40/day and over mileage fees as $2/mile. If a customer has rental service for 2 days, and odometer limit of 500 miles/day. So rental service

has a limitation of total 1000 miles. If this rental service has used 1050 miles, then customer will be charged as 2days*$40 + $2*50 extra miles, totaling to $180.

c)
WOW has customers of types Individual or Corporate. WOW maintains list of their customers with Customer's Full Address, Email address, and Phone number. WOW keeps only one address of each customer.

d)
For Individual customer WOW stores Customer Full Name, Driver License Number, Insurance Company Name and Insurance Policy Number. At present, WOW does not provide vehicle insurance to their customers for car rental service and customers need to bring his/her own insurance.

e)
For Corporate customers, WOW maintains details of Name and Registration number of the corporation, and Employee ID of the customer who rents the car on a corporate account.

f)
WOW occasionally mails discount coupons to their customers and also mails such discount coupons to neighborhood residents. WOW, provides discounts to their individual customers who bring in such a coupon at the time of renting a vehicle. Such discount coupons carry validity dates and percentage of discount offered, for example 5% discount valid from 03/01/2022 to 03/31/2022.

g)
WOW provides discount to corporate customers on fixed corporate discount set for affiliated corporate companies and that discounts differs from corporation to corporation. Such discount is offered to corporate customers irrespective of date of rental service.

h)
WOW provides only one type of the discount (individual discount coupon or corporate discount) at a time for the rental service and does not allow both discounts for the same rental service.

i)
For each rental service, WOW records Pickup Location, Drop off Location, Pickup Date, Drop off Date, Start Odometer, End Odometer, and Daily Odometer Limit for the rental service. Some rental services are with unlimited mileage.

j)
For each rental service provided, WOW raises (generates) an invoice with Invoice Date, and Invoice Amount. This can be accomplished though database trigger.

k)
WOW allows customers to pay an invoice using multiple methods (credit/debit/gift card) and stores multiple records for each payment made against an invoice, WOW stores Payment Date, Payment Method, and Card Number for each payment.

l) For each rental office location, WOW keeps records of its Full Address, and Phone Number

Submission: Each student in project team needs to submit.

I. **A single PDF document with following contents:**
II. **Cover page with clearly stated course, section, submission date, team members' names and Ids.**
III. **A properly documented description and justification of your entire design (no more than half page), assumptions that you have made other than stated business rules, if any.**
IV. **Logical Model of database design**
V. **Relational Model of database design**
VI. **List of tables and record counts of each table (Number of records should be 10 to 25 records in each table. Child tables should have more records than parent tables)**
VII. **DDL code (Table creation code along with PK, FK, and Check constraints)**
VIII. **DML code (insert statement for all tables)**
IX. **Database trigger code that used for generating invoice**
X. **Data Dictionary results of following queries. Replace ABC with prefix of your table names.**

```
REM:  List of Tables

select table_name
from user_tables
where table_name like 'ABC%';

REM: List of Table Columns

select table_name, column_name,column_id
from user_tab_columns
where table_name like 'ABC%'
order by table_name,column_id;
```

REM: List of Table Column Constraints

```
Select
table_name,constraint_name,constraint_type,search_condition,index_name,r_constraint_name,delete_rule
from user_constraints
where table_name like 'ABC%'
order by table_name;
```

REM: List of Table Column Comments

```
select table_name,column_name,comments
from user_col_comments
where table_name like 'ABC%'
order by table_name;
```

===== END OF THE PROJECT PART 1 DOCUMENT ======