# CSCE 2501 - Fundamentals of Database Systems
# Assignment 2

**This is an individual assignment. Rules governing academic integrity are strongly enforced without exception.**

1. For the following table describing sales transactions, write a SELECT query to obtain the data points required in the subsequent questions **(10 points)**

```
CREATE TABLE Sales(
   OID INTEGER PRIMARY KEY,
   Item VARCHAR(20) NOT NULL,
   Price FLOAT,
   Qty INTEGER,
   Date DATETIME,
   CustomerName VARCHAR(30) NOT NULL
);
```

   a. List all of the unique items in alphabetical order. **(1 point)**
   b. List all of the customers who bought at least 1 Hammer. **(1 point)**
   c. List all of the items bought on February 25th, 2020. Include the item and customer name listed by the items in alphabetical order. **(2 points)**
   d. List all of the items bought by "Omar Ahmed" on January 21st, 2020.
   e. What is the grand total in sales? Sales is calculated by multiplying qty by price for each row. **(2 points)**
   f. What is the average quantity of items that were bought by each customer during the month of March 2020? Display results as "Avg Quantity". **(2 points)**
   g. What is the average sales for all the orders during the month of January 2020? Display the amounts as "Avg Sales". Sales is calculated by multiplying qty by price for each row. **(2 points)**

2. Consider the following database designed for a large hotel. The hotel consists of several sections (front area, back area, sport area, … etc.) each of which contains a set of rooms of several types. There is one general manager for each section. Each room in a section is given a number (unique only across the same section), and has a room type and status (available, out of service, in maintenance, … etc.). Each room type has a price for each seasonal period (at least, there are three types of seasonal periods: high, medium and low) and for each customer type (local, foreign, group, … etc). The hotel has a set of members of staff responsible for the day-to-day operations of the hotel. The work is organized into shifts. Each shift is described by a code (unique), working schedule (start time and end time), and bonus rate. Members of staff may work in shifts but only one at a time. Each shift has a general supervisor. The database keeps track of the current and future reservation transactions. A reservation transaction is assigned a unique reference number and includes information about one room (mandatory) reserved for one or more customers, one of them is the reserving (status = 'R' and the others, if any, are accompanying (status = 'A'). **(25 points)**

**SECTION** (**SectCode**, SectName, ViewDescription, ManagerStaffNumber)
**ROOM** (**SectCode**, **RoomNo**, RoomTypeCode, Status)
**ROOM_TYPE** (**RoomTypeCode**, RoomTypeName)
**SEASON** (**SeasonCode**, SeasonName)
**CUSTOMER_TYPE** (**CustomerTypeCode**, CustomerTypeName)
**PRICE** (**RoomTypeCode**, **SeasonCode**, **CustomerTypeCode**, PriceValue)
**MEMBER_STAFF** (**StaffNumber**, Name, Gender, JobCode, ShiftCod)
**SHIFT** (**ShiftCode**, StartTime, EndTime, BonusValue, SuperStaffNumber)
**JOB** (**JobCode**, JobDescription, BasicSalary)
**CUSTOMER** (**CustFirstName**, **CustLastName**, CustomerTypeCode, Nationality, CreditCardNo)
**RESERVATION** (**ReferenceNo**, SectCode, RoomNo, CheckInDD, CheckInMM, CheckInYYYY, NumberOfNights, ActualPrice)
**RESERVATION_CUSTOMER** (**ReferenceNo**, **CustFirstname**, **CustLastName**, status)

a. Write the set of CREATE statements to generate the following tables; PRICE, MEMBER_STAFF, RESERVATION, RESERVATION_CUSTOMER assuming the remaining tables already exist in the database. Your statements should assume appropriate data types for the underlying attributes and specify all the necessary entity and referential integrity constraints. **(10 points)**

b. Get number, name, and job description of all members of staff who are not working in any shift. **(1 point)**

c. Get the name and nationality of all customers who have more than 5 reservations in years 2019 and 2020. **(2 points)**

d. For each shift with less than 10 members of staff, get the shiftCode, supervisor's name, and total number of members of staff. **(2 points)**

e. Define a statistical view against the given database to retrieve the total number of sold units, and total income for each section, room type, month, and year. **(8 points)**

f. Write a query against the defined view to retrieve the total number of sold units and total income of double rooms (room type = 'D') in section (SectCode = 'S01') during July of 2020. **(2 points)**

3. Consider the following database schema of a manufacturing plant. **(15 points)**

**ManufacturingUnit** (**CountryName**, **CityName**, Area)
**Supplier** (**SNO**, SName, CountryName, CityName, Email)
**Item** (**PartNumber**, ItemType)
**ItemType** (**ItemType**, BasePrice)
**Supply** (**SNO**, **PartNumber**, **CountryName**, **CityName**, Quantity)
**Product** (**ProductCode**, ProductType, ProductBasePrice)
**ManufacturingLine** (**CountryName**, **CityName**, **LineNumber**, ProductCode)
**ManufacturingJob** (**CountryName**, **CityName**, **LineNumber**, **Month**, **Year**, Quantity)

a. Retrieve the total production (total produced quantity) of all the "Cosmetics" products in the years 2019 and 2020. **(3 points)**

b. Retrieve the Product Code and Type of all products that are not manufactured by any manufacturing line. **(3 points)**

c. For each manufacturing line in Cairo, Egypt and for each year, display the manufacturing line number and the total production (total produced quantity) only for manufacturing lines that produce more than 20,000 units in total. **(3 points)**

d. Retrieve the total number of products that are manufactured by more than three manufacturing lines. **(3 points)**

e. Retrieve the suppliers information (name, city, country and email) along with the total cost of the items they supplied of the "SpareParts" types. List only the suppliers who supplied more than 10 spare parts. **(3 points)**