CS443 - Lab 1

Questions:

1) Answer the following questions:

a) Just by observing the tables below, what would you choose the primary key of each table?

Table Name:	Salesreps	Office	Customers	Orders	Products
Primary key:	EMPL_NUM	OFFICE	CUST_NUM	ORDER_NUM	PRODU

b) Based on the explanation of the attributes given on pages 2 – 5 write down all the foreign keys. For example, if you think that Rep_Office is a foreign key in the Salesreps table, you should write:

- **REP_OFFICE** is a foreign key in the Salesreps table because it refers to the primary key (**OFFICE**) of the Office Table.

- **MANAGER** is a recursive foreign key in the Salesreps table because it refers to the primary key (**EMPL_NUM**) of the Salesreps Table.

- **MGR** is a foreign key in the Office table because it refers to the primary key (**EMPL_NUM**) of the Salesreps Table.

- **CUST_REP** is a foreign key in the Customers table because it refers to the primary key (**EMPL_NUM**) of the Salesreps Table.

- **CUST** is a foreign key in the Orders table because it refers to the primary key (**CUST_NUM**) of the Customers table.

- **REP** is a foreign key in the Orders table because it refers to the primary key (**CUST_NUM**) of the Customers table.

- **MFR & PRODU** are a composite foreign key in the Orders Table because it refers to the composite primary key (**MFR & PRODU**) of the Products Table.

2) It is true that the "Office" by itself is a primary key in the office table. Suppose we do not want "office ID" to be the primary key or be part of a "Composite Primary key," and we prefer "City" to be the primary key or part of the Primary Key. What assumption(s) do you need to make to make the city the primary key or part of the primary key? Note that you can add an additional column to the table that may not exist. **Hint: Some cities like "San Marcos" may exist in more than one state.**

- To make the city column of the office table, we assume that in each city there is only one office for each city. Otherwise, if there is another office in the same city then city could not be a primary key if it contains duplicates in the column. If we assume there are more than one office in the city, then we should add an additional column that holds unique information about the office in the city to create a composite primary key. An alternative, although not efficient, is to make a composite primary key using columns city and office from offices table.

3) What is the difference between the primary and candidate keys? How many primary key(s) can a table have? How many Foreign keys can a table have? How many candidate keys can a table have?

- The difference between primary key and candidate key is that candidate keys are eligible to become primary keys. A table is allowed to have only a single primary key, and although this is true for primary keys, a table can have multiple columns that contain unique information throughout so it can have multiple candidate keys, it can also have multiple foreign keys.

4) Suppose you have a city table with the following attribute:

- State, City name, Zip code, Population, Region

   o Is there any problem with choosing Population as the primary key? Explain.

   Although the population of a city may be unique to the city itself, the population is always changing, and there is a possibility that the more than one city shares the same population at a given time, which would make the population column not a good option to be used for a primary key.

   o Is there any problem with choosing a Zip code as a primary key? Explain.

   There is a problem with choosing a zip code as a primary key for the city table. Zip codes can cross state lines and be shared with other states. An example is 97635 which is shared between Oregon and California. If it is shared between states, then it is shared between cities. So, the zip code would not be unique and cannot be used as a primary key.