Chapter Eight Questions:

Q2: Explain why it might be more appropriate to declare an attribute that contains only digits as a character data type instead of a numeric data type.

Ans: For some data like zip-code and area-code, even they only contain digits, adding or subtracting these number is meaningless. Also, some zip-code start with 0, which will be dropped if stored in numerical data type.

Q5: What is the purpose of a CHECK constraint?

Ans: It is used to validate data when an attribute is entered. It checks to see that a specified condition exists.

Q7: What is the difference between an INSERT command and an UPDATE command?

Ans: INSERT creates new rows in the table but UPDATE only changes existing rows.

Rick' s Problems:

Q1:

```
DROP TABLE EMPLOYEE;
DROP TABLE JOB;
CREATE TABLE JOB(
    Job_Code INT NOT NULL AUTO_INCREMENT,
    Job_Description VARCHAR(200),
    Job_Chg_Hour FLOAT,
    Job_Last_Update DATE,
    PRIMARY KEY(Job_Code)
);

CREATE TABLE EMPLOYEE(
    Emp_Num INT NOT NULL AUTO_INCREMENT,
    Emp_LName VARCHAR(20),
    Emp_FName VARCHAR(20),
    Emp_Initial VARCHAR(1),
    Emp_HireDate DATE,
    Job_Code INT NOT NULL,
    Emp_Years INT,
    PRIMARY KEY(Emp_Num),
    FOREIGN KEY(Job_Code)
    REFERENCES JOB(Job_Code)
    ON DELETE NO ACTION
    ON UPDATE CASCADE
);
```

```
INSERT INTO JOB (Job_Description, Job_Chg_Hour, Job_Last_Update) VALUE
('TEST JOB ONE', 12.3, '20211102');
INSERT INTO JOB (Job_Description, Job_Chg_Hour, Job_Last_Update) VALUE
('TEST JOB TWO', 14.1, '20211101');
INSERT INTO JOB (Job_Description, Job_Chg_Hour, Job_Last_Update) VALUE
('TEST JOB THREE', 20.0, '20211104');
SELECT * FROM JOB;

INSERT INTO EMPLOYEE (Emp_LName, Emp_FName, Emp_Initial, Emp_HireDate,
Job_Code, Emp_Years) VALUE ('yulong', 'wang', 'I', '20211104', 1, '12');
INSERT INTO EMPLOYEE (Emp_LName, Emp_FName, Emp_Initial, Emp_HireDate,
Job_Code, Emp_Years) VALUE ('tony', 'john', 'H', '20211102', 2, '1');
INSERT INTO EMPLOYEE (Emp_LName, Emp_FName, Emp_Initial, Emp_HireDate,
Job_Code, Emp_Years) VALUE ('tom', 'jack', 'Q', '20211111', 3, '20');
SELECT * FROM EMPLOYEE;
```

```
MariaDB [ywang92]> INSERT INTO JOB (Job_Description, Job_Chg_Hour, Job_Last_Update) VALUE ('TEST JOB ONE', 12.3, '20211102');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> INSERT INTO JOB (Job_Description, Job_Chg_Hour, Job_Last_Update) VALUE ('TEST JOB TWO', 14.1, '20211101');
Query OK, 1 row affected (0.01 sec)

b_Chg_Hour, Job_Last_Update) VALUE ('TEST JOB THREEMariaDB [ywang92]> INSERT INTO JOB (Job_Description, Job_Chg_Hour, Job_Last_Update) VALUE ('TEST JOB THREE', 20.0, '20211104');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> SELECT * FROM JOB;
+----------+-----------------+--------------+-----------------+
| Job_Code | Job_Description | Job_Chg_Hour | Job_Last_Update |
+----------+-----------------+--------------+-----------------+
|        1 | TEST JOB ONE    |         12.3 | 2021-11-02      |
|        2 | TEST JOB TWO    |         14.1 | 2021-11-01      |
|        3 | TEST JOB THREE  |           20 | 2021-11-04      |
+----------+-----------------+--------------+-----------------+
3 rows in set (0.01 sec)

MariaDB [ywang92]> INSERT INTO EMPLOYEE (Emp_LName, Emp_FName, Emp_Initial, Emp_HireDate, Job_Code, Emp_Years) VALUE ('yulong', 'wang', 'I', '20211104', 1, '12');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> INSERT INTO EMPLOYEE (Emp_LName, Emp_FName, Emp_Initial, Emp_HireDate, Job_Code, Emp_Years) VALUE ('tony', 'john', 'H', '20211102', 2, '1');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> INSERT INTO EMPLOYEE (Emp_LName, Emp_FName, Emp_Initial, Emp_HireDate, Job_Code, Emp_Years) VALUE ('tom', 'jack', 'Q', '20211111', 3, '20');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> SELECT * FROM EMPLOYEE;
+---------+-----------+-----------+-------------+--------------+----------+-----------+
| Emp_Num | Emp_LName | Emp_FName | Emp_Initial | Emp_HireDate | Job_Code | Emp_Years |
+---------+-----------+-----------+-------------+--------------+----------+-----------+
|       1 | yulong    | wang      | I           | 2021-11-04   |        1 |        12 |
|       2 | tony      | john      | H           | 2021-11-02   |        2 |         1 |
|       3 | tom       | jack      | Q           | 2021-11-11   |        3 |        20 |
+---------+-----------+-----------+-------------+--------------+----------+-----------+
3 rows in set (0.00 sec)
```

a)： What happens if you create the EMPLOYEE table before the JOB table? Why?

Ans: When creating EMPLOYEE table first, the system raise an erroe because the EMPLOYEE table requires a not null foreign key so system is looking for the Job_Code in JOB which has not been created yet.

b)： What happens if you add an employee record with a JOB _CODE not present in the JOB table? Why?

Ans: The system raises an error because the DBMS is maintaining reference integrity which require foreign to refer to a valid record in another table. However, we are referring to an non-exist record in this situation.

Q2:

a). Create a table in your MySQL/MariaDB account, Schools, as shown below:

```
MariaDB [ywang92]> CREATE TABLE schools (
    ->     schoolId INT NOT NULL AUTO_INCREMENT,
    ->     name VARCHAR(50) NOT NULL,
    ->     province VARCHAR(20) DEFAULT NULL,
    ->     language CHAR(2) DEFAULT NULL,
    ->     level VARCHAR(10) DEFAULT NULL,
    ->     PRIMARY KEY (schoolId)
    -> );
Query OK, 0 rows affected (0.01 sec)

MariaDB [ywang92]> show columns from schools;
+----------+-------------+------+-----+---------+----------------+
| Field    | Type        | Null | Key | Default | Extra          |
+----------+-------------+------+-----+---------+----------------+
| schoolId | int(11)     | NO   | PRI | NULL    | auto_increment |
| name     | varchar(50) | NO   |     | NULL    |                |
| province | varchar(20) | YES  |     | NULL    |                |
| language | char(2)     | YES  |     | NULL    |                |
| level    | varchar(10) | YES  |     | NULL    |                |
+----------+-------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)
```

b). Create and test three types of SQL statements. Show your work from the command line (i.e. correct command and result).

1:

```
INSERT INTO schools (name, province, language, level) VALUE ('University of New Brunswick', 'NB', 'EN','University');
INSERT INTO schools (name, province, language, level) VALUE ('Miami University', 'OH', 'EN','University');
INSERT INTO schools (name, province, language, level) VALUE ('Columbia University', 'NY', 'EN','University');
SELECT * FROM schools;
```

```
MariaDB [ywang92]> INSERT INTO schools (name, province, language, level) VALUE ('University of New Brunswick', 'NB', 'EN','University');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> INSERT INTO schools (name, province, language, level) VALUE ('Miami University', 'OH', 'EN','University');
, province, language, level) VALUE ('Columbia UnivQuery OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> INSERT INTO schools (name, province, language, level) VALUE ('Columbia University', 'NY', 'EN','University');
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> SELECT * FROM schools;
+----------+----------------------------+----------+----------+------------+
| schoolId | name                       | province | language | level      |
+----------+----------------------------+----------+----------+------------+
|        1 | University of New Brunswick | NB       | EN       | University |
|        2 | Miami University           | OH       | EN       | University |
|        3 | Columbia University        | NY       | EN       | University |
+----------+----------------------------+----------+----------+------------+
3 rows in set (0.00 sec)
```

2.

```
UPDATE schools
SET province = 'Manitoba'
WHERE schoolId = 2;
SELECT * FROM schools;
```

```
MariaDB [ywang92]> UPDATE schools
    -> SET province = 'Manitoba'
    -> WHERE schoolId = 2;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [ywang92]> SELECT * FROM schools;
+----------+-----------------------------+----------+----------+------------+
| schoolId | name                        | province | language | level      |
+----------+-----------------------------+----------+----------+------------+
|        1 | University of New Brunswick | NB       | EN       | University |
|        2 | Miami University            | Manitoba | EN       | University |
|        3 | Columbia University         | NY       | EN       | University |
+----------+-----------------------------+----------+----------+------------+
3 rows in set (0.00 sec)
```

3.

```
DELETE FROM schools WHERE province = 'Manitoba';
SELECT * FROM schools;
```

```
MariaDB [ywang92]> DELETE FROM schools WHERE province = 'Manitoba';
Query OK, 1 row affected (0.00 sec)

MariaDB [ywang92]> SELECT * FROM schools;
+----------+-----------------------------+----------+----------+------------+
| schoolId | name                        | province | language | level      |
+----------+-----------------------------+----------+----------+------------+
|        1 | University of New Brunswick | NB       | EN       | University |
|        3 | Columbia University         | NY       | EN       | University |
+----------+-----------------------------+----------+----------+------------+
2 rows in set (0.00 sec)
```