Question 1

Consider a database scheme consisting of the following relations for recording information about students in a university.

Units (<u>unitindex chart8)</u>, UnitName varchar(40), CreditPoints integer)

Students (<u>ID char(8),</u> FirstName varchar(15), LastName varchar(15) not null, BirthDate date)

Enrollments (<u>Student chart8). Unit charf8), Year Number f4).</u> Mark number (3))

The primary keys are underlined. The unit attribute is a foreign key referring to the units table. Similarly, the student attribute is a foreign key referring to the people table.

A tuple in the units table consists of the unitIndex, unitName and the number of credit points for that unit. A tuple in the Students table consists of the Student's ID, FirstName and LmtName as well as their Birth Date. The enrollments table records information about enrollments of students in units. A tuple in the enrollments table consists of the Student (he enrolled), the Unit (the unit index of the unit), the year of the enrollment and the rpark (if any) achieved for that unit.

a) Write appropriate SQL statement for the following.
   i. Find the units with less than 10 students enrolled in them. Report only the unit name.
   ii. For each student who has completed more than two units, print the student last name and number of Units that obtained more than 75 marks. Marks get recorded in the Enrollments table only after completing the unit.

b) It has been found that many users of the database frequently have a need to find out how many students are enrolled in a particular unit in a year, although different users are interested in different units.
   i. Produce a view called *'studentsByUnit'* to make this query convenient. Include the unit name in addition to the other relevant attributes for this view.
   ii. Use this view to find out how many people are enrolled in "Database Systems" in 2013.

c) Time has passed since the view *'studentsByUnit'* mentioned in part b) i. was set up, and it has been found that studentsByUnit is consuming significant computing resources because so many people are using it. It has been decided to reduce this problem by adding a new attribute called *stuCount* to the units table. Do this as follows,
   i. Add an attribute of type integer called *stuCount* to the Units table.
   ii. Write an update statement to initialize the values of the stuCou.at attribute so that for each unit the value of stuCount is the number of student s enrolled in that unit.