CSE 581 : INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

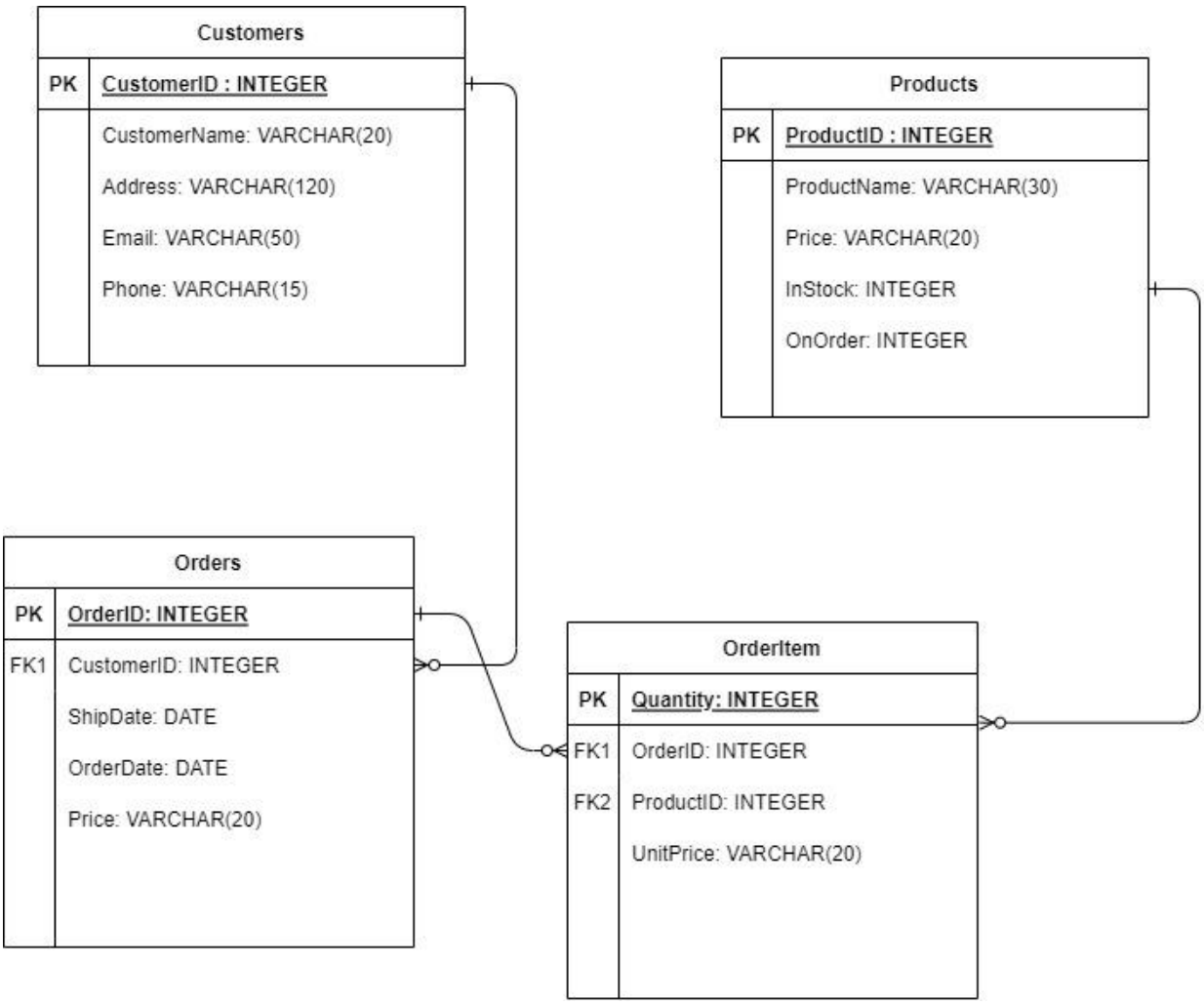
LAB : 6

DATE : 10/19/2022

Q1) Design a database diagram for a product orders database with four tables. Indicate the relationships between tables and identify the primary key and foreign key in each table. Explain your design decisions.

1. Customers (CustomerID, CustomerName, Address, Email, Phone)
2. Orders (OrderID, CustomerID, OrderDate, ShipDate, Price)
3. OrderItem (OrderID, ProductID, Quantity, UnitPrice)
4. Products (ProductID, ProductName, Price, InStock, OnOrder)

Ans:

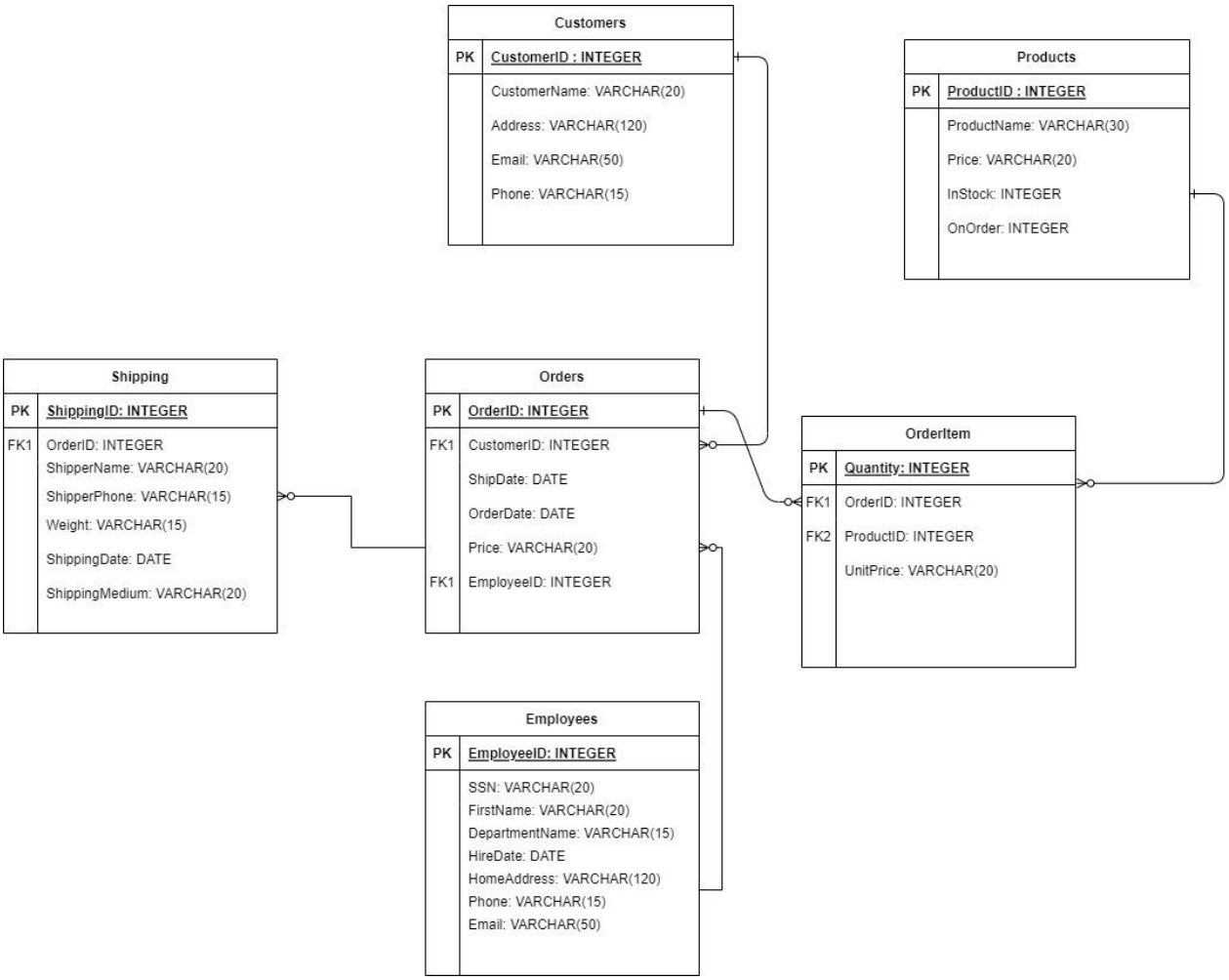


Comment: There are four tables in this design which are Customers, Orders, OrderItem, Products. The Customers table has five columns namely CustomerID of Integer type, CustomerName of VARCHAR(20) type, Address of VARCHAR(120) type, Email of VARCHAR(50) type and Phone of VARCHAR(15) type where CustomerID is taken as the Primary key. The Orders table has five columns namely OrderID of Integer type, CustomerID of Integer type, OrderDate of DATE type, ShipDate of DATE type and Price of VARCHAR(20) type where OrderID is the Primary Key and CustomerID is the foreign key taken as reference from the Customers table. The OrderItem table has four columns namely OrderID of Integer type, ProductID of Integer type, Quantity of Integer type and UnitPrice of VARCHAR(20) type where Quantity is the Primary Key, ProductID and OrderID are the foreign keys which are taken as references. The Products table has five columns namely ProductID of Integer type, ProductName of VARCHAR(30), Price of VARCHAR(20) type, InStock of Integer type, OnOrder of Integer type where ProductID is the Primary Key. Here, there is one-to-many relation between Customers and Orders table, between Orders and OrderItem tables and also between Products and OrderItem table.

Q2) Add the two tables below into the design for question 1. Create additional tables and columns if necessary. Explain your design decisions.

- Shipping (ShippingID, OrderID, ShipperName, ShipperPhone, Weight, ShippingDate, ShippingMedium)
- Employees (EmployeeID, SSN, FirstName, LastName, DepartmentName, HireDate, HomeAddress, Phone, Email)

Ans:

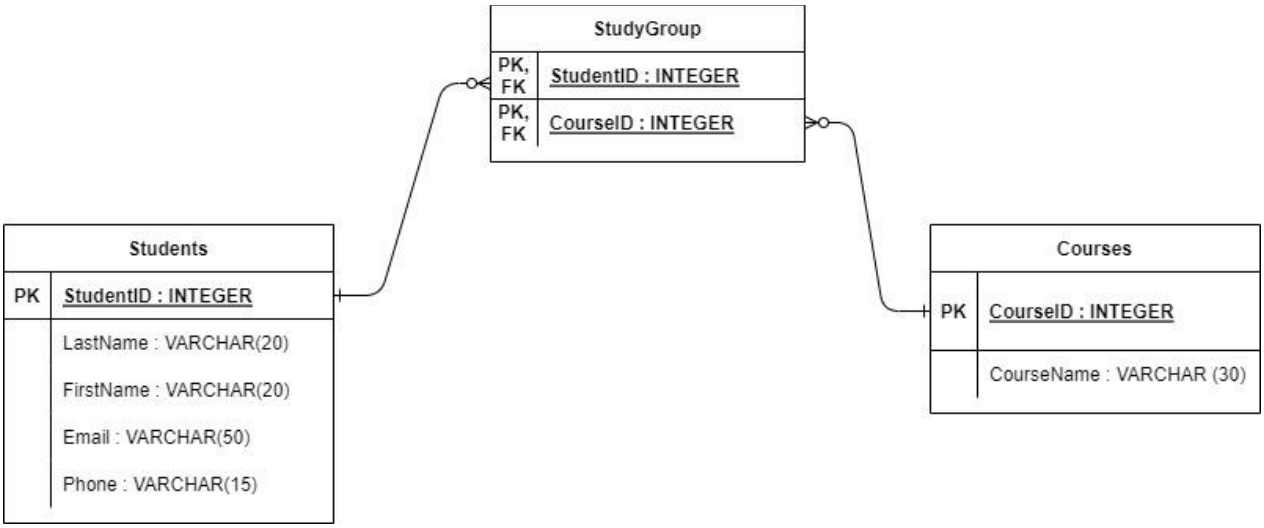


Comment: Here are six tables in this design which are Customers, Orders, OrderItem, Products. The Customers table has five columns namely CustomerID of Integer type, CustomerName of VARCHAR(20) type, Address of VARCHAR(120) type, Email of VARCHAR(50) type and Phone of VARCHAR(15) type where CustomerID is taken as the Primary key. The Orders table has six columns namely OrderID of Integer type, CustomerID of Integer type, OrderDate of DATE type, ShipDate of DATE type, Price of VARCHAR(20) type and EmployeeID of Integer type where OrderID is the Primary Key and CustomerID and EmployeeID are the foreign keys taken as reference from the Customers table and Employees table respectively. The OrderItem table has four columns namely OrderID of Integer type, ProductID of Integer type, Quantity of Integer type and UnitPrice of VARCHAR(20) type where Quantity is the Primary Key, ProductID and OrderID are the foreign keys which are taken as references. The Products table has five columns namely ProductID of Integer type, ProductName of VARCHAR(30), Price of VARCHAR(20) type, InStock of Integer type, OnOrder of Integer type where ProductID is the Primary Key. The Employees table has nine columns namely EmployeeID of Integer type taken as Primary

Key, SSN of VARCHAR(20) type, FirstName of VARCHAR(20) type, LastName of VARCHAR(20) type, DepartmentName of VARCHAR(30) type, HireDate of DATE type, HomeAddress of VARCHAR(120) type, Phone of VARCHAR(15) type and EMAIL of VARCHAR(50) type. The Shipping table has seven columns namely ShippingID of Integer type as primary key, OrderID of Integer type taken as foreign key as reference of Orders table, ShipperName of VARCHAR() type, ShipperPhone of VARCHAR(15) type, Weight of Integer type, ShippingDate of DATE type, ShippingMedium of VARCHAR(20) type. Here, there is one-to-many relation between Customers and Orders table, between Orders and OrderItem tables, between Products and OrderItem table, between Orders and Shipping tables and between Employees and Orders table.

Q3) Design a database diagram that allows students to be assigned study-group membership for one or more courses. Each course can have any number of students and each student can be in any number of courses. Create additional tables and columns, if necessary. Indicate the relationships between tables and identify the primary key and foreign key in each table. Explain your decisions.

Ans:

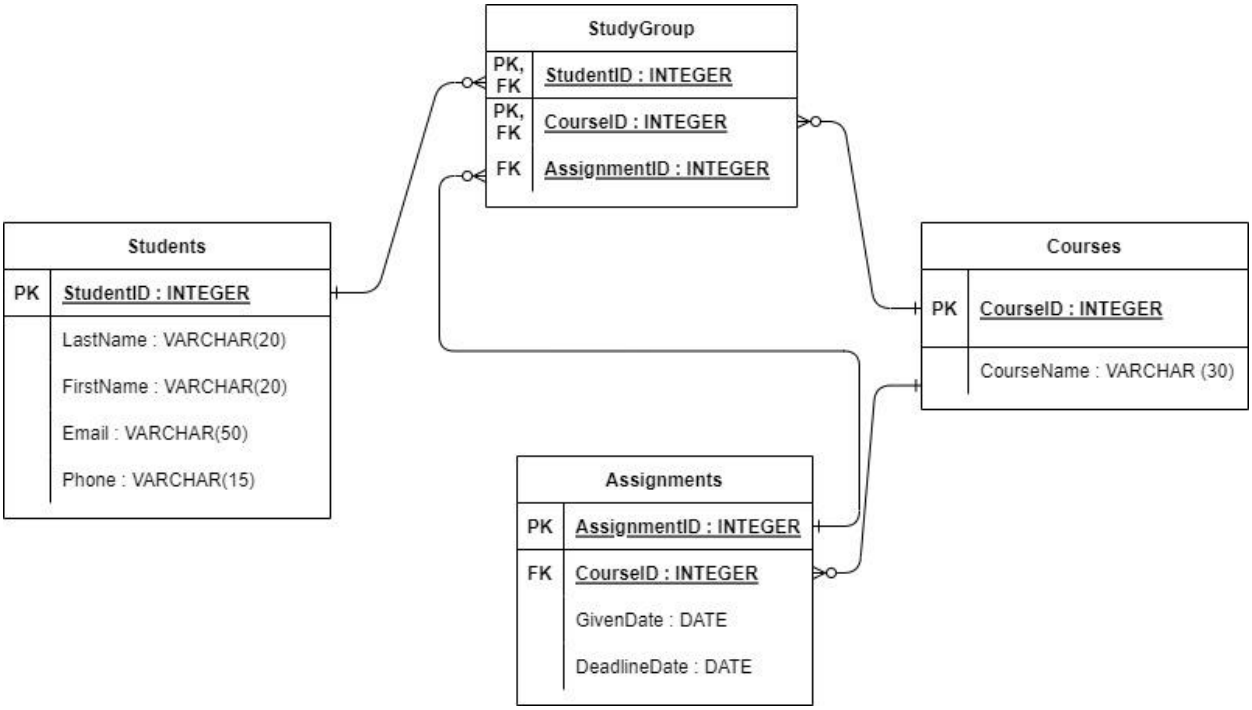


Comment: There are three tables in this design which are Students, StudyGroup, and Courses. The Students table has five columns namely StudentID of Integer type, LastName of VARCHAR(20) type, FirstName of VARCHAR(120) type, Email of VARCHAR(50) type and Phone of VARCHAR(15) type where StudentID is taken as the Primary key. The Courses table had two columns namely CourseID of Integer type and CourseName of

VARCHAR(30) type where CourseID is the Primary Key. The third table is StudyGroup table which has two columns namely StudentID of Integer type, and CourseID of Integer type where both columns are taken as primary key-foreign key. There is a one-to-many relationship between Students and StudyGroup table and between the Courses and the StudyGroup table.

Q4) Modify your design for question 3 to keep track of the assignment for each student in each course. Each student can be given multiple assignments in each course. Each course has a unique set of assignments for the students to complete. Create additional tables and columns if necessary. Indicate the relationships between tables and identify the primary key and foreign key in each table. Explain your decisions.

Ans:



Comment: There are four tables in this design which are Students, StudyGroup, and Courses. The Students table has five columns namely StudentID of Integer type, LastName of VARCHAR(20) type, FirstName of VARCHAR(120) type, Email of VARCHAR(50) type and Phone of VARCHAR(15) type where StudentID is taken as the Primary key. The Courses table had two columns namely CourseID of Integer type and CourseName of VARCHAR(30) type where CourseID is the Primary Key. The third table is StudyGroup table which has three columns namely StudentID of Integer type, and CourseID of Integer type where both columns are taken as primary key-foreign key and AssignmentID of Integer type taken as Foreign Key. The fourth table is Assignments table which has four columns

namely AssignmentID of Integer type which is taken as the Primary Key, CourseID of Integer type taken as Foreign key, GivenDate of DATE type and DeadlineDate of DATE type. There is a one-to-many relationship between Students and StudyGroup table, between the Courses and the StudyGroup table, between Assignments and the StudyGroup table and between the Courses and the Assignments table.

Remarks: Concepts related to keys, database design, tables, data types, relationships and diagrams are used in this lab.