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**Metropolitan State University**

**ICS 311 —Database Management Systems**

**Homework #4 Total: 24 Points**

**What to submit:**

Submit SQL Script that includes SQL statements to answer Part 1, Part 2, and Part 4. Make sure that your SQL script runs without any errors. Submit answers to Part 3 with the homework word document. Both files should be uploaded to D2L.

**Question 1 (5 Points): Creating the database:**

Create a database using your name. Then create the following tables. The underlined **bold** column names are the primary keys. Make sure to specify the primary and foreign key constraints in your “create table” statements.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Customer** |  | **Invoice** |  | **Vendor** |
| **cus\_code : integer** |  | **inv\_number :integer** |  | **vend\_code : integer** |
| cus\_lname : varchar(20) |  | cus\_code :integer |  | vend\_name : varchar(30) |
| cus\_fname : varchar(20) |  | inv\_date :date |  | vend\_contact : varchar(30) |
| cus\_initial : char(1) |  | foreign key cus\_code |  | vend\_areacode : integer |
| cus\_areacode : integer |  | references customer table |  | vend\_phone : integer |
| cus\_phone : integer |  |  |  |  |
|  |  |  |  |  |
| **Product** |  | **Line** |  |  |
| **prod\_code : integer** |  | **inv\_number : integer** |  |  |
| prod\_desc : varchar(50) |  | **prod\_code : integer** |  |  |
| prod\_price : integer |  | line\_units : integer |  |  |
| prod\_quant : integer |  | foreign key inv\_number |  |  |
| vend\_code : integer |  | references Invoice table |  |  |
| foreign key vend\_code |  | foreign key prod\_code |  |  |
| references Vendor table |  | references Product table |  |  |

create database NalongsoneDanddank;

use NalongsoneDanddank;

drop table if exists Customer;

drop table if exists Invoice;

drop table if exists Vendor;

drop table if exists Product;

drop table if exists Line;

create table Customer(

cus\_code integer,

cus\_lname varchar(20) not null,

cus\_fname varchar(20) not null,

cus\_initial char(1),

cus\_areacode integer,

cus\_phone integer,

primary key(cus\_code)

);

create table Invoice(

inv\_number integer,

cus\_code integer,

inv\_date date,

primary key(inv\_number),

foreign key (cus\_code) references Customer(cus\_code) on delete set null

);

create table Vendor(

vend\_code integer,

vend\_name varchar(30) not null,

vend\_contact varchar(30) not null,

vend\_areacode integer,

vend\_phone integer,

primary key(vend\_code)

);

create table Product(

prod\_code integer,

prod\_desc varchar(50),

prod\_price integer not null,

prod\_quant integer,

vend\_code integer,

primary key(prod\_code),

foreign key(vend\_code) references Vendor(vend\_code) on delete set null

);

create table Line(

inv\_number integer,

prod\_code integer,

line\_units integer,

primary key(inv\_number, prod\_code),

foreign key(inv\_number) references Invoice(inv\_number),

foreign key(prod\_code) references Product(prod\_code)

);

**Question 2 (5 Points): Inserting data:**

Insert the following data in the tables using insert into statements:

1. **customer:**

10010, Johnson, Alfred, A, 615, 8442573

10011, Dunne, Leona, K, 713, 8941238

10012, Smith, Walter, W, 615, 8942285

10013, Roberts, Paul, F, 615, 2221672

10014, Orlando, Myla, NULL, 615, 2971228

insert into Customer(cus\_code, cus\_lname, cus\_fname, cus\_initial, cus\_areacode, cus\_phone) values(10010, 'Johnson', 'Alfred', 'A', 615, 8442573), (10011, 'Dunne', 'Leona', 'K', 713, 8941238), (10012, 'Smith', 'Walter', 'W', 615, 8942285),(10013, 'Roberts', 'Paul', 'F', 615, 2221672), (10014, 'Orlando', 'Myla', NULL, 615, 2971228);

1. **invoice:**

1001, 10011, 2008-08-03

1002, 10014, 2008-08-04

1003, 10012, 2008-03-20

1004, 10014, 2008-09-23

insert into Invoice(inv\_number, cus\_code, inv\_date) values(1001, 10011, '2008-08-03'), (1002, 10014, '2008-08-04'),(1003, 10012, '2008-03-20'),(1004, 10014, '2008-09-23');

1. **vendor:**

232, Bryson, Smith, 615, 2233234

235, Walls, Anderson, 615, 2158995

236, Jason, Schmidt, 651, 2468850

insert into Vendor(vend\_code, vend\_name, vend\_contact, vend\_areacode, vend\_phone) values(232, 'Bryson', 'Smith', 615, 2233234),(235, 'Walls', 'Anderson', 615, 2158995),(236, 'Jason', 'Schmidt', 651, 2468850);

1. **product:**

12321, hammer, 189 ,20, 232

65781, chain, 12, 45, 235

34256, tape, 35, 60, 236

12333, hanger, 200 ,10, 232

insert into Product(prod\_code, prod\_desc, prod\_price, prod\_quant, vend\_code) values(12321, 'hammer', 189 ,20, 232),(65781, 'chain', 12, 45, 235), (34256, 'tape', 35, 60, 236),(12333, 'hanger', 200 ,10, 232);

1. **line:**

1001, 12321, 1

1001, 65781, 3

1002, 34256, 6

1003, 12321, 5

1002, 12321, 6

insert into Line(inv\_number, prod\_code, line\_units) values(1001, 12321, 1), (1001, 65781, 3),(1002, 34256, 6),(1003, 12321, 5),(1002, 12321, 6);

**Question 3 (5 Points): Checking entity and referential integrity:**

Write an SQL statement to do each of the following tasks in the given order (try 1, 2, 3, 4, then 5). Explain whether and why the statement is correctly executed or not

1. Insert the following entry in CUSTOMER

10012, ‘Juan’, ‘Rodriguez’, ‘J’, 612, 7788776

insert into Customer(cus\_code, cus\_lname, cus\_fname, cus\_initial, cus\_areacode, cus\_phone) value(10012, 'Juan', 'Rodriguez', 'J', 612, 7788776);

-- -- the SQL statement action output Error, message: "Duplicate entry '10012' for key 'PRIMARY' "

-- -- that means cannot insert the row because there has already primary key, 10012, on the table. primary key cannot duplicate.

1. Insert the following entry in INVOICE

1005, 10017, ’2008-11-30’

insert into Invoice(inv\_number, cus\_code, inv\_date) values(1005, 10017, '2008-11-30');

-- -- the SQL statement action output Error, message: "Cannot add or update a child row: a foreign key Customer(cus\_code) does not exist"

-- -- that means the foreign key cus\_code that want to insert, 10017, does not exist.

1. Insert the following entry in PRODUCT

12322, ‘hammer’, 189, 20, 231

insert into Product(prod\_code, prod\_desc, prod\_price, prod\_quant, vend\_code) value(12322, 'hammer', 189, 20, 231);

-- -- the SQL statement action output Error, message: "Cannot add or update a child row: a foreign key Vender(vend\_code) does not exist"

-- -- that means the foreign key cus\_code that want to insert, 231, does not exist.

1. Insert the following entry to the VENDOR table

231,’Adam’, ‘Eric’, 615, 2158995

insert into Vendor(vend\_code, vend\_name, vend\_contact, vend\_areacode, vend\_phone) values(231,'Adam','Eric', 615, 2158995);

-- -- the SQL statement action output succesful. However, if running this statement before the last one,

-- -- it would be succesful because it missing "231",vend\_code, foreign key(vend\_code) references to the primary key of Vendor table.

1. Insert the following entry in PRODUCT

12322, ‘coil’, 189, 20, 231

insert into Product(prod\_code, prod\_desc, prod\_price, prod\_quant, vend\_code) value(12322, 'coil', 189, 20, 231);

-- -- the SQL statement action output succesful. However, if running this statement before the last one,

-- -- it would be unsuccess because it missing "231",vend\_code, foreign key(vend\_code) references to the primary key of Vendor table.

**Question 4 (9 Points): SQL Queries**

Write SQL statements to answer each of the following questions.

1. *List the Customer Code, Last name, and First Name for all customers.*

*select cus\_code as 'Customer Code', cus\_lname as 'Last naem', cus\_fname as 'First name' from Customer;*

1. *List the invoice number and invoice date for all invoices of customer number 10014.*

*select inv\_number as 'Invoice number', inv\_date as 'Invoice date' from Invoice where cus\_code = 10014;*

1. *List the product code and product quantity for products with invoice number 1001.*

*Answer option 1:*

*select prod\_code as 'Product code', prod\_quant as 'Product quantity' from Product natural join Line where inv\_number = 1001;*

*Answer option 2:*

*select p.prod\_code as 'Product code', p.prod\_quant as 'Product quantity' from Product p, Line l where p.prod\_code = l.prod\_code and l.inv\_number = 1001;*

1. *List all product description and product price supplied by vendor whose vendor contact is ‘Nobody’.*

*select prod\_desc as 'Product description', prod\_price as 'Product price' from Product natural join Vendor where vend\_contact = ‘Nobody’;*

1. *Produce a list of product description, vendor name, and vendor phone for all products with quantity less than or equal to 60.*

*select prod\_desc as 'Product description', vend\_name as 'Vendor name', vend\_phone as 'Vendor phone' from Product natural join Vendor where prod\_quant <= 60;*

1. *For each product bought by a customer, list product description, customer’s first name and last name.*

*Answer option 1:*

*select prod\_desc as 'Product description', cus\_fname as 'Customer firstname', cus\_lname as 'Customer lastname' from line natural join invoice natural join customer natural join product;*

*Answer option 2:*

*select prod\_desc as 'Product description', group\_concat(cus\_fname, ' ', cus\_lname separator '; ') as 'Customer fullname' from line natural join invoice natural join customer natural join product group by prod\_desc;*