



CS 443

ASSIGNMENT 2

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March 30, 2017



Question #1

HOTEL

HNum	HNoOfRooms	HPhone	HAdd
------	------------	--------	------

ROOM

RNum	RRate	RSize	ROccupied	RLoc
------	-------	-------	-----------	------

MANAGER

MID	MName	MAdd	MPhone	MEmail	MSal
-----	-------	------	--------	--------	------

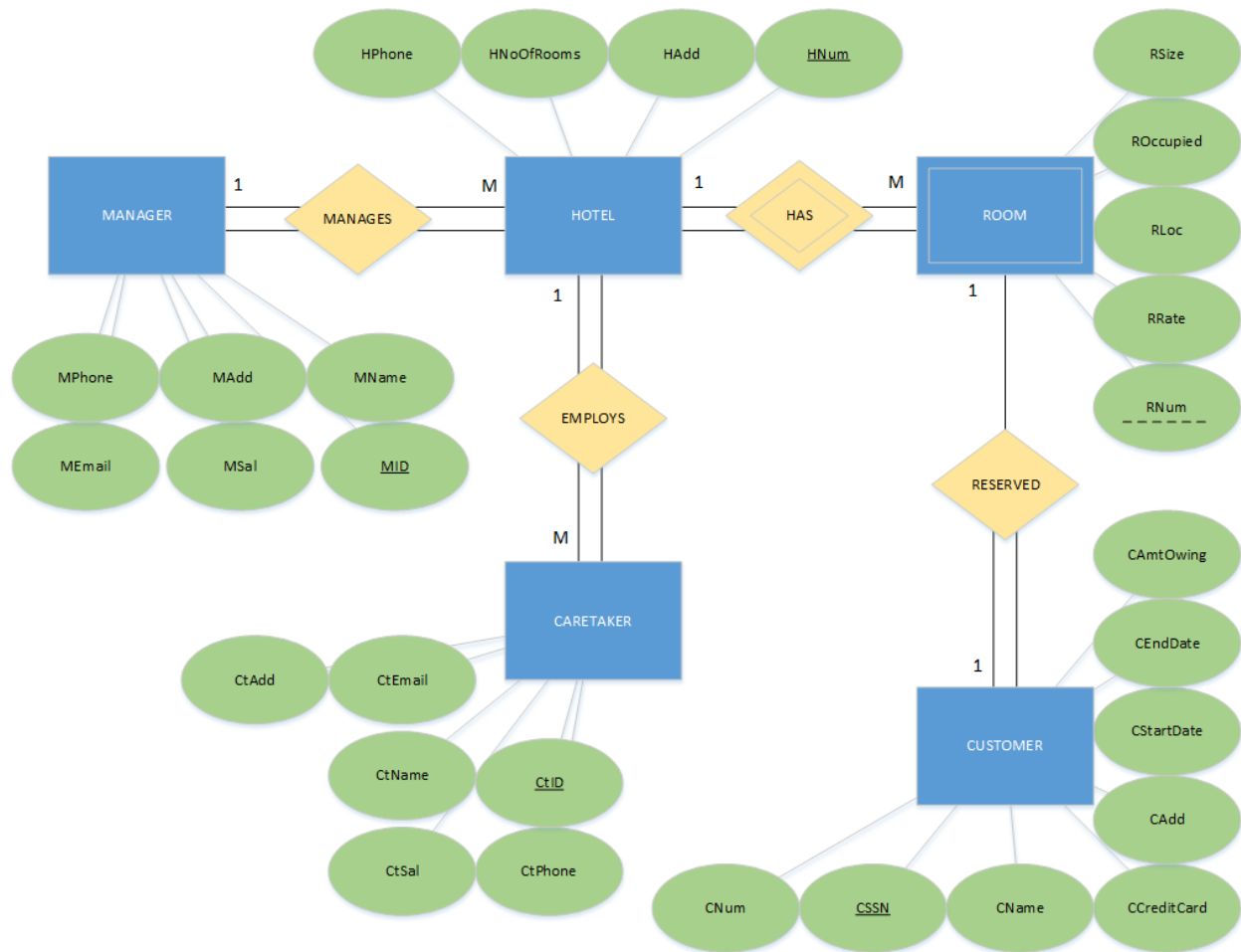
CARETAKER

CtID	CtName	CtAdd	CtPhone	CtEmail	CtSal
------	--------	-------	---------	---------	-------

CUSTOMER

CNum	CSSN	CName	CCreditCard	CAdd	CStartDate	CEndDate	CAmtOwing
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A. Draw ERD based on the above assumptions and data.

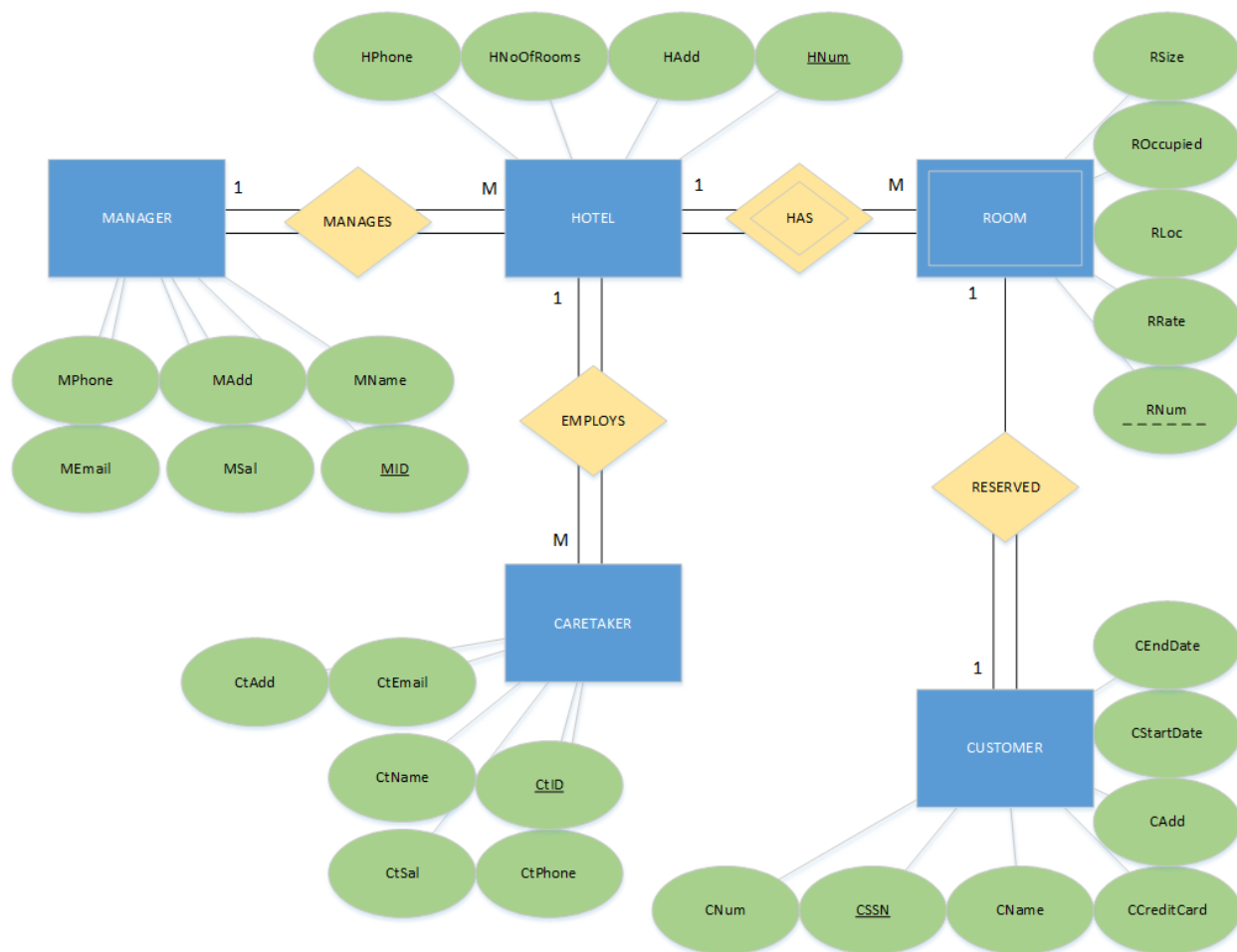


B. Draw tables from the initial ERD and normalize them. Place all tables in 3rd normal form (if necessary).

MANAGER (MID, MPhone, MEmail, MSal, MName, MAdd)
HOTEL (HNum, HAdd, HNoOfRooms, HPhone, MID*)
ROOM (HNum*, RNum, RRate, RLoc, ROccupied, RSize)
CARETAKER (CtID, CtPhone, CtSal, CtName, CtEmail, CtAdd, HNum*)
CUSTOMER (CSSN, CNum, CName, CEndDate, CStartDate, CAdd, CCreditCard, (HNum*, RNum*))

NOTE: I removed CAmtOwing from table CUSTOMER because it's a derived attribute resulting from the calculation of:
 $(CStartDate - CEndDate) \times RRate$

C. Revise your ERD (if necessary).



D. Create tables (w/ constraints) using SQL statements.

A2_Q1Queries.SQL

```
CREATE TABLE Manager
(MID          NUMBER,
MPhone       CHAR(7),
MEmail       VARCHAR(100),
MSal         NUMBER(7,2),
MName        VARCHAR(50),
MAdd         VARCHAR(50),
CONSTRAINT MngrPK PRIMARY KEY(MID),
CONSTRAINT Mngr_CheckMID CHECK(MID>=111111 AND MID<=999999),
CONSTRAINT Mngr_CheckPhone CHECK(MPhone LIKE '[2-9][2-9][2-9][2-9][2-9][2-9][2-9]'))
);
```

```
CREATE TABLE Hotel
(HNum        NUMBER,
HAdd         VARCHAR(50),
HNoOfRooms   NUMBER,
HPhone       CHAR(7),
MID          NUMBER,
CONSTRAINT HotelPK PRIMARY KEY(HNum),
CONSTRAINT Hotel_CheckNoOfRms CHECK(HNoOfRooms>0 AND HNoOfRooms<=200),
CONSTRAINT Hotel_UniquePhn UNIQUE(HPhone),
CONSTRAINT Hotel_CheckPhone CHECK(HPhone LIKE '[2-9][2-9]0[2-9][2-9][2-9][2-9]'),
CONSTRAINT Hotel_CheckMID CHECK(MID>=111111 AND MID<=999999))
);
```

```
CREATE TABLE Room
(HNum        NUMBER,
RNum         NUMBER,
RRate        NUMBER(5,2),
RLoc         NUMBER,
ROccupied    CHAR(5),
RSize        NUMBER,
CONSTRAINT RoomPK PRIMARY KEY(HNum,RNum),
CONSTRAINT Rm_CheckRNo CHECK(RNum>0 AND RNum<=200),
CONSTRAINT Rm_CheckRRate CHECK(RRate>=50),
CONSTRAINT Rm_CheckRSize CHECK(RSize>=2 AND RSize<=4),
CONSTRAINT Rm_CheckROcc CHECK(ROccupied IN ('false','true')),
CONSTRAINT Rm_CheckRLoc CHECK(RLoc>0 AND RLoc<=100))
);
```

```
CREATE TABLE Caretaker
(CtID        NUMBER,
CtPhone      CHAR(7),
CtSal        NUMBER(7,2),
CtName       VARCHAR(50),
CtEmail      VARCHAR(200),
CtAdd        VARCHAR(50),
HNum         NUMBER,
CONSTRAINT CtPK PRIMARY KEY(CtID),
```

```

CONSTRAINT Ct_CheckID CHECK(CtID>=111111 AND CtID<=999999),
CONSTRAINT Ct_CheckPhone CHECK(CtPhone LIKE '[2-9][2-9][2-9][2-9][2-9][2-9][2-9]'),
CONSTRAINT Ct_CheckSal CHECK(CtSal>20000 AND CtSal<40000)
);

```

```

CREATE TABLE Customer
(CSSN          CHAR(9),
CNum           NUMBER,
CName          VARCHAR(50),
CStartDate     DATE,
CEndDate       DATE,
CAdd           VARCHAR(50),
CCreditCard    VARCHAR(25),
HNum           NUMBER,
RNum           NUMBER,
CONSTRAINT CustPK PRIMARY KEY(CSSN),
CONSTRAINT Cust_CheckSSN CHECK(CSSN LIKE '60[0-9][0-9][0-9][0-9][0-9][0-9][0-9]'),
CONSTRAINT Cust_CheckRNo CHECK(RNum>0 AND RNum<=200)
);

```

```

ALTER TABLE Hotel
    ADD CONSTRAINT HotelFK_MID
        FOREIGN KEY(MID)
        REFERENCES Manager(MID);

```

```

ALTER TABLE Room
    ADD CONSTRAINT RmFK_HNum
        FOREIGN KEY(HNum)
        REFERENCES Hotel(HNum);

```

```

ALTER TABLE Caretaker
    ADD CONSTRAINT CtFK_HNum
        FOREIGN KEY(HNum)
        REFERENCES Hotel(HNum);

```

```

ALTER TABLE Customer
    ADD CONSTRAINT CustFK
        FOREIGN KEY(HNum,RNum)
        REFERENCES Room(HNum,RNum);

```

Question #2

Note: I changed the colors of my screenshots so I don't have to use a lot of my personal black ink, hence the different colors used in my results.

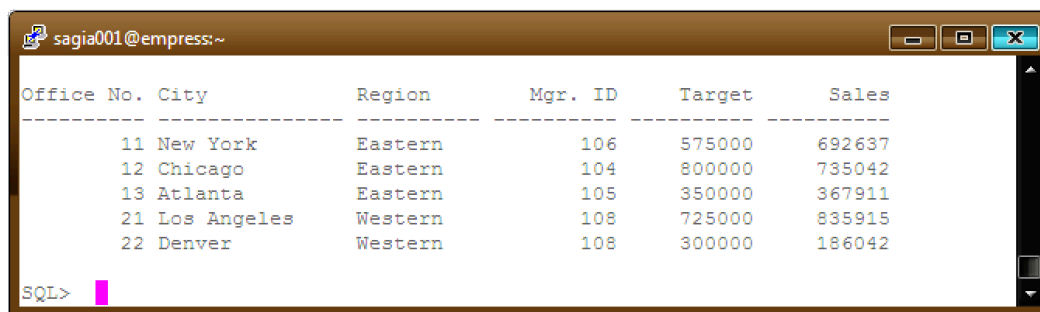
Question 1:

Write a select statement to list all the columns from the Offices table. 'Select *' is not allowed. Return the list in Office order.

Query 1:

```
SELECT Office AS "Office No.", City AS "City", Region AS "Region",  
Mgr AS "Mgr. ID", Target AS "Target", Sales AS "Sales"  
FROM Offices  
ORDER BY Office;
```

Result 1:



Office No.	City	Region	Mgr. ID	Target	Sales
11	New York	Eastern	106	575000	692637
12	Chicago	Eastern	104	800000	735042
13	Atlanta	Eastern	105	350000	367911
21	Los Angeles	Western	108	725000	835915
22	Denver	Western	108	300000	186042

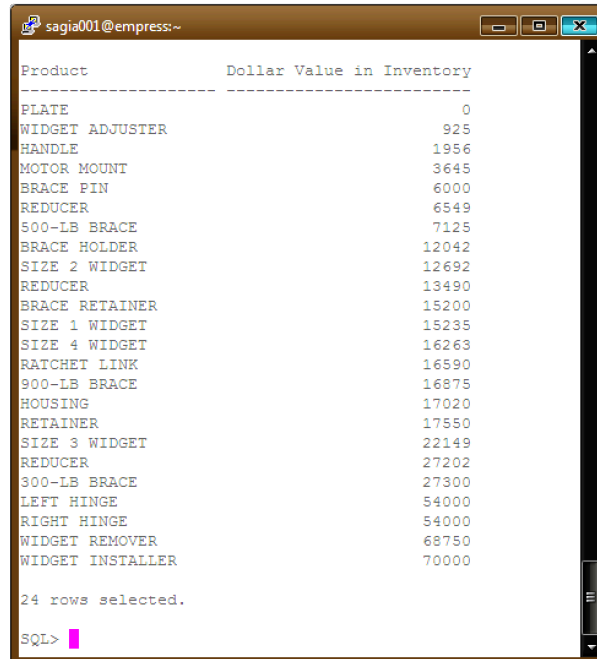
SQL>

Question 2:

List the Product Name (its description), and dollar value of quantity on hand (price * quantity) .
Return the list in descending order by value.

Query 2:

```
SELECT Description AS "Product",
Price*Qty_On_Hand AS "Dollar Value in Inventory"
FROM Products
ORDER BY 2;
```

Result 2:


Product	Dollar Value in Inventory
PLATE	0
WIDGET ADJUSTER	925
HANDLE	1956
MOTOR MOUNT	3645
BRACE PIN	6000
REDUCER	6549
500-LB BRACE	7125
BRACE HOLDER	12042
SIZE 2 WIDGET	12692
REDUCER	13490
BRACE RETAINER	15200
SIZE 1 WIDGET	15235
SIZE 4 WIDGET	16263
RATCHET LINK	16590
900-LB BRACE	16875
HOUSING	17020
RETAINER	17550
SIZE 3 WIDGET	22149
REDUCER	27202
300-LB BRACE	27300
LEFT HINGE	54000
RIGHT HINGE	54000
WIDGET REMOVER	68750
WIDGET INSTALLER	70000

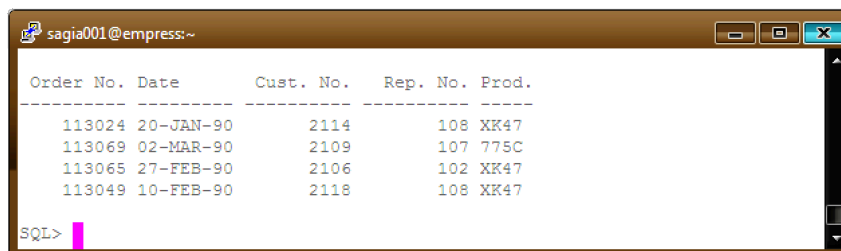
24 rows selected.
SQL>

Question 3:

New: List the Order Number, Order Date, Customer Number and Sales Rep Number for orders for part 'XK47' or '775C'. (Use a compound search condition - OR.)

Query 3:

```
SELECT Order_Num AS "Order No.", Order_Date AS "Date", Cust AS "Cust. No.",
Rep AS "Rep. No.", Product AS "Prod."
FROM Orders
WHERE (Product = 'XK47') OR (Product = '775C');
```

Result 3:


Order No.	Date	Cust. No.	Rep. No.	Prod.
113024	20-JAN-90	2114	108	XK47
113069	02-MAR-90	2109	107	775C
113065	27-FEB-90	2106	102	XK47
113049	10-FEB-90	2118	108	XK47

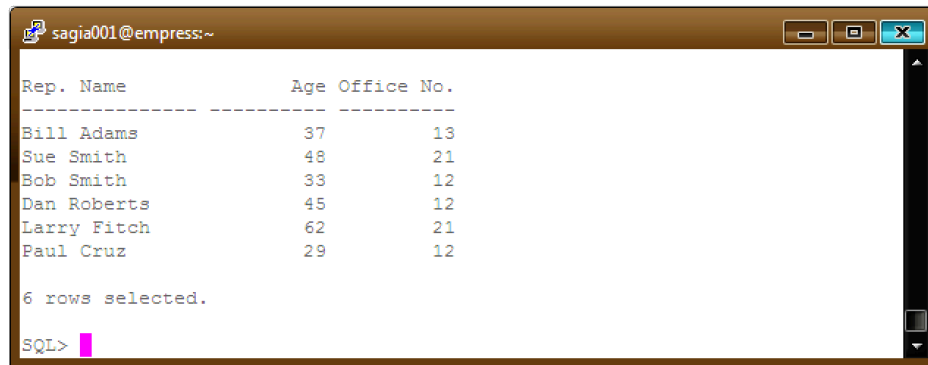
SQL>

Question 4:

List the Name and Age for all Sales Reps in the following offices: 12; 21; 13. (Use the set membership test - IN.)

Query 4:

```
SELECT Name AS "Rep. Name", Age AS "Age", rep_office AS "Office No."  
FROM Salesreps  
WHERE rep_office IN (12,21,13);
```

Result 4:

Rep. Name	Age	Office No.
Bill Adams	37	13
Sue Smith	48	21
Bob Smith	33	12
Dan Roberts	45	12
Larry Fitch	62	21
Paul Cruz	29	12

6 rows selected.

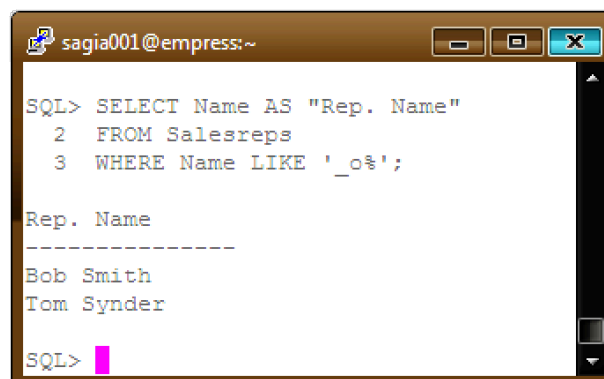
SQL>

Question 5:

List the names of all Sales Reps who have the letter 'o' (this is lower case o) as the second character of their name.

Query 5:

```
SELECT Name AS "Rep. Name"  
FROM Salesreps  
WHERE Name LIKE '_o%';
```

Result 5:

```
SQL> SELECT Name AS "Rep. Name"  
2 FROM Salesreps  
3 WHERE Name LIKE '_o%';
```

Rep. Name
Bob Smith
Tom Synder

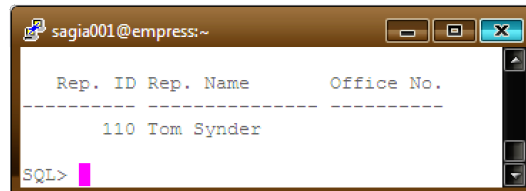
SQL>

Question 6:

Return the Sales Rep ID and Name of any Sales Rep not assigned to an office yet.

Query 6:

```
SELECT empl_num AS "Rep. ID", name AS "Rep. Name", rep_office AS "Office No."
FROM Salesreps
WHERE rep_office IS NULL;
```

Result 6:


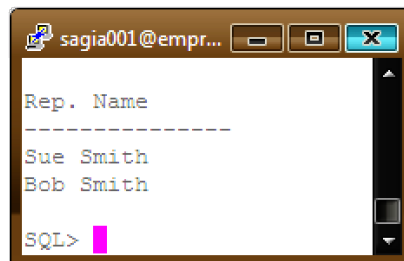
Rep. ID	Rep. Name	Office No.
110	Tom Synder	

Question 7:

Show all the sales rep names with last name "Smith".

Query 7:

```
SELECT name AS "Rep. Name"
FROM Salesreps
WHERE name LIKE '%Smith';
```

Result 7:


Rep. Name
Sue Smith
Bob Smith

Question 8:

List different titles in the sales reps table. Only list each title once and unknown titles should be ignored.

Query 8:

```
SELECT DISTINCT title AS "Rep. Title"
FROM Salesreps
WHERE title IS NOT NULL;
```

Result 8:


Rep. Title
Sales Rep
Sales Mgr
VP Sales

Question 9:

List the description of the products which are at least 6 character and less than 10 character long. No duplicate row is allowed. You can use the build in function length() to do this. For example, length(name) return the number of characters for attribute called "name".

Query 9:

```
SELECT DISTINCT Description AS "Product"
FROM Products
WHERE (length(Description)>=6) AND (length(Description)<10);
```

Result 9:

```
sagia001@empres:~
Product
-----
REDUCER
HANDLE
HOUSING
BRACE PIN
RETAINER
SQL>
```

Question 10:

List the the order nums with the name of the rep who placed the order and the name of the customer who made the order and the name of the rep for that customer

Query 10:

```
SELECT Order_Num AS "Order No.", OrderRep.Name AS "Placed By", Company AS
"Customer", CustRep.Name AS "Cust. Rep."
FROM Orders, Salesreps OrderRep, Salesreps CustRep, Customers
WHERE (Rep=OrderRep.Empl_Num) AND (Cust=Cust_Num) AND
(Cust_Rep=CustRep.Empl_Num);
```

Result 10:

```
sagia001@empres:~
Order No. Placed By      Customer              Cust. Rep.
-----
112987 Bill Adams      Acme Mfg.             Bill Adams
113027 Bill Adams      Acme Mfg.             Bill Adams
112983 Bill Adams      Acme Mfg.             Bill Adams
112963 Bill Adams      Acme Mfg.             Bill Adams
113012 Bill Adams      JCP Inc.              Paul Cruz
113003 Mary Jones      Holm and Landis       Mary Jones
113058 Mary Jones      Holm and Landis       Mary Jones
113065 Sue Smith       Fred Lewis Corp.      Sue Smith
112993 Sue Smith       Fred Lewis Corp.      Sue Smith
113048 Sue Smith       Rico Enterprises       Sue Smith
112979 Sue Smith       Orion Corp.           Sue Smith
112989 Sam Clark       Jones Mfg.            Sam Clark
112961 Sam Clark       J.P. Sinclair         Sam Clark
113042 Dan Roberts     Ian and Schmidt       Bob Smith
113055 Dan Roberts     Holm and Landis       Mary Jones
112968 Dan Roberts     First Corp.           Dan Roberts
113034 Tom Synder      Ace International      Tom Synder
113036 Tom Synder      Ace International      Tom Synder
113049 Larry Fitch     Midwest Systems       Larry Fitch
112992 Larry Fitch     Midwest Systems       Larry Fitch
113007 Larry Fitch     Zetacorp              Larry Fitch
113024 Larry Fitch     Orion Corp.           Sue Smith
113013 Larry Fitch     Midwest Systems       Larry Fitch
113045 Larry Fitch     Zetacorp              Larry Fitch
113051 Larry Fitch     Midwest Systems       Larry Fitch
113057 Paul Cruz       JCP Inc.              Paul Cruz
112975 Paul Cruz       JCP Inc.              Paul Cruz

27 rows selected.
SQL>
```

Question 3:

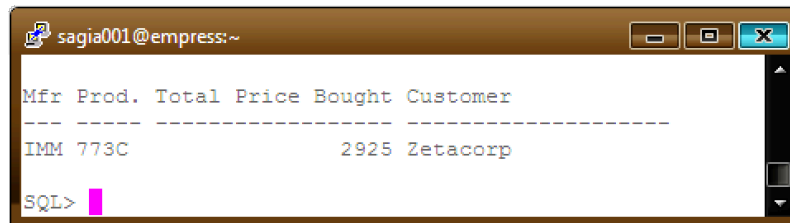
Question 1:

List the Mfr Id, the Product Id, Company and PRICE of all products bought by customers where customer number is one of (2112,2105,2119) and where the amount of the order < \$5000.00. Order the results by ascending Company.

Query 1:

```
SELECT Mfr_ID AS "Mfr. ID", Product_ID AS "Prod.",  
Amount AS "Total Price Bought", Company AS "Customer"  
FROM Products, Customers, Orders  
WHERE (Product_ID=Product) AND (Cust=Cust_Num)  
AND (Cust_Num IN (2112,2105,2119)) AND (Amount<5000)  
ORDER BY Company;
```

Result 1:



Mfr	Prod.	Total Price Bought	Customer
IMM 773C		2925	Zetacorp

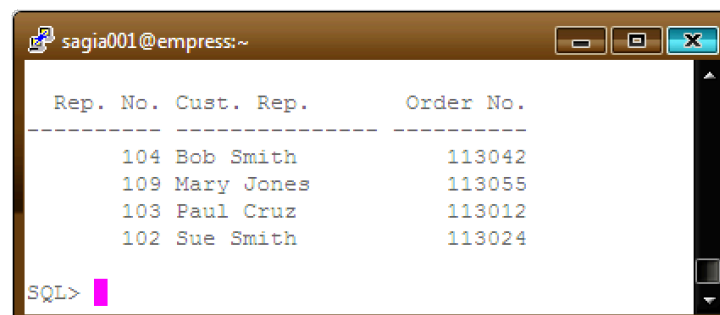
Question 2:

List all salesreps (id and names) and all orders (orderNumber) in which the salesrep is the company's (i.e. the customer) rep (Cust Rep), but didn't take the order. Order the result based on name in ascending order.

Query 2:

```
SELECT Cust_Rep AS "Rep. No.", CustRep.Name AS "Cust. Rep.",  
Order_Num AS "Order No."  
FROM Orders, Salesreps OrderRep, Salesreps CustRep, Customers  
WHERE (Rep=OrderRep.Empl_Num) AND (Cust=Cust_Num) AND (Cust_Rep=Empl_Num)  
AND NOT (Rep=Cust_Rep)  
ORDER BY CustRep.Name;
```

Result 2:



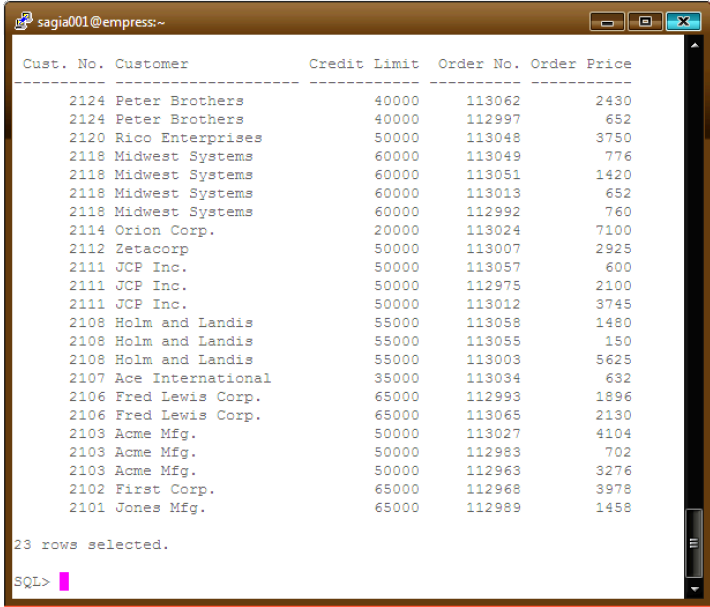
Rep. No.	Cust. Rep.	Order No.
104	Bob Smith	113042
109	Mary Jones	113055
103	Paul Cruz	113012
102	Sue Smith	113024

Question 3:

List all customers (Customer number, Company, and Credit Limit) and orders (Order Number, Amount) where the order is within \$10000.00 of the Credit Limit (less than or equal to \$10000). Sort the result by Customer number in descending order.

Query 3:

```
SELECT Cust_Num AS "Cust. No.", Company AS "Customer",
Credit_Limit AS "Credit Limit", Order_Num AS "Order No.",
Amount AS "Order Price"
FROM Customers, Orders
WHERE (Cust_Num=Cust) AND (Amount<=10000)
ORDER BY Cust_Num DESC;
```

Result 3:


Cust. No.	Customer	Credit Limit	Order No.	Order Price
2124	Peter Brothers	40000	113062	2430
2124	Peter Brothers	40000	112997	652
2120	Rico Enterprises	50000	113048	3750
2118	Midwest Systems	60000	113049	776
2118	Midwest Systems	60000	113051	1420
2118	Midwest Systems	60000	113013	652
2118	Midwest Systems	60000	112992	760
2114	Orion Corp.	20000	113024	7100
2112	Zetacorp	50000	113007	2925
2111	JCP Inc.	50000	113057	600
2111	JCP Inc.	50000	112975	2100
2111	JCP Inc.	50000	113012	3745
2108	Holm and Landis	55000	113058	1480
2108	Holm and Landis	55000	113055	150
2108	Holm and Landis	55000	113003	5625
2107	Ace International	35000	113034	632
2106	Fred Lewis Corp.	65000	112993	1896
2106	Fred Lewis Corp.	65000	113065	2130
2103	Acme Mfg.	50000	113027	4104
2103	Acme Mfg.	50000	112983	702
2103	Acme Mfg.	50000	112963	3276
2102	First Corp.	65000	112968	3978
2101	Jones Mfg.	65000	112989	1458

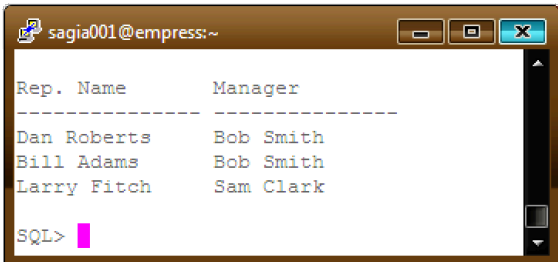
23 rows selected.
SQL>

Question 4:

List all salesreps names and their managers' names where the salesrep is at least as old as the manager.

Query 4:

```
SELECT Rep.Name AS "Rep. Name", Mngr.Name AS "Manager"
FROM Salesreps Rep, Salesreps Mngr
WHERE (Rep.Manager=Mngr.Empl_Num) AND (Rep.Age>=Mngr.Age);
```

Result 4:


Rep. Name	Manager
Dan Roberts	Bob Smith
Bill Adams	Bob Smith
Larry Fitch	Sam Clark

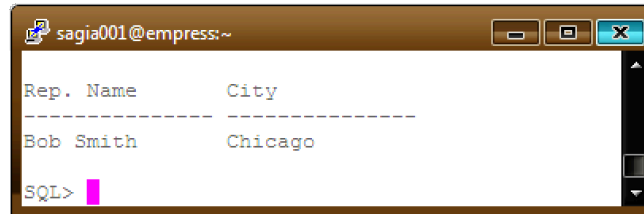
SQL>

Question 5:

List all salesreps (Name) and the City they work in where the sales of the salesrep < Quota and the sales for the office is < Target.

Query 5:

```
SELECT Name AS "Rep. Name", City AS "City"
FROM Salesreps, Offices
WHERE (Rep_Office=Office)
AND (Salesreps.Sales<Quota) AND (Offices.Sales<Target);
```

Result 5:


Rep. Name	City
Bob Smith	Chicago

Question 6:

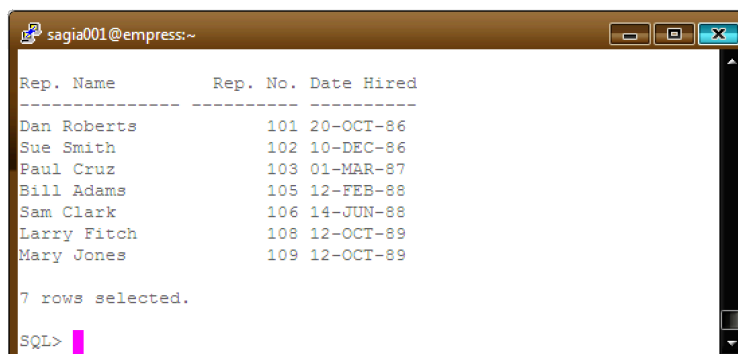
List the name, id, and hire date of the salesreps where at least one of the two conditions hold:

- The salesrep sales should be greater than the quota
- The salesrep has taken an order from Customer number 2117, 2111, or 2101.

Sort the result by the salesrep's id.

Query 6:

```
SELECT DISTINCT Name AS "Rep. Name", Empl_Num AS "Rep. No.",
Hire_Date AS "Date Hired"
FROM Salesreps, Orders
WHERE (Empl_Num=Rep)
AND ((Sales>Quota) OR (Cust IN (2117,2111,2101)))
ORDER BY Empl_Num;
```

Result 6:


Rep. Name	Rep. No.	Date Hired
Dan Roberts	101	20-OCT-86
Sue Smith	102	10-DEC-86
Paul Cruz	103	01-MAR-87
Bill Adams	105	12-FEB-88
Sam Clark	106	14-JUN-88
Larry Fitch	108	12-OCT-89
Mary Jones	109	12-OCT-89

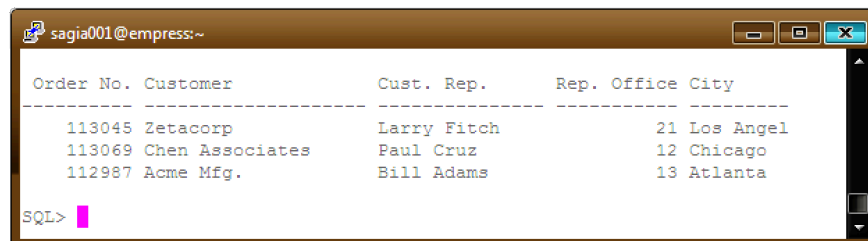
7 rows selected.

Question 7:

List all orders (Order Number) over \$25000 showing the company placing the order, the Customer Rep assign to the company, the Office id and the city where the Customer Rep works in, such that the Customer Rep's manager is not the person who actually took the order.

Query 7:

```
SELECT Order_Num AS "Order No.", Company AS "Customer",
Name AS "Cust. Rep.", Rep_Office AS "Rep. Office",
City AS "City"
FROM Orders, Customers, Salesreps, Offices
WHERE (Cust=Cust_Num)
AND (Cust_Rep=Empl_Num) AND (Rep_Office=Office)
AND (Amount>25000) AND NOT (Rep=Manager);
```

Result 7:


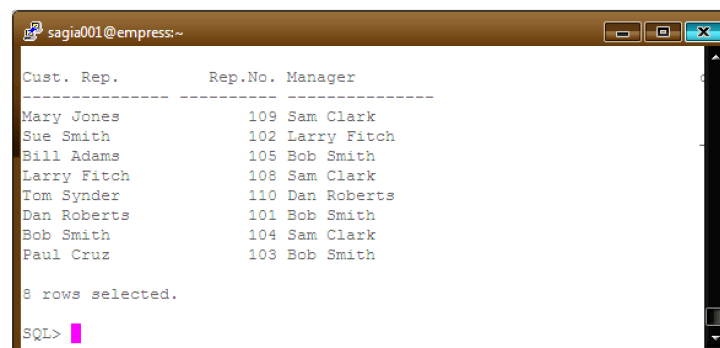
Order No.	Customer	Cust. Rep.	Rep. Office	City
113045	Zetacorp	Larry Fitch	21	Los Angel
113069	Chen Associates	Paul Cruz	12	Chicago
112987	Acme Mfg.	Bill Adams	13	Atlanta

Question 8:

List all customer reps (their name and their id) and their managers name in which the manager has taken an order for the customer Rep's company or the manager is based in New York or Denver. Use appropriate column header

Query 8:

```
SELECT CustRep.Name AS "Cust. Rep.", Cust_Rep AS "Rep. No.",
Mngr.Name AS "Manager"
FROM Customers, Salesreps CustRep, Salesreps Mngr, Orders
WHERE (Cust_Rep=CustRep.Empl_Num) AND (CustRep.Manager=Mngr.Empl_Num)
AND (Cust=Cust_Num)
AND ((Rep=CustRep.Manager) OR (Mngr.Rep_Office IN (22,11)));
```

Result 8:


Cust. Rep.	Rep.No.	Manager
Mary Jones	109	Sam Clark
Sue Smith	102	Larry Fitch
Bill Adams	105	Bob Smith
Larry Fitch	108	Sam Clark
Tom Synder	110	Dan Roberts
Dan Roberts	101	Bob Smith
Bob Smith	104	Sam Clark
Paul Cruz	103	Bob Smith

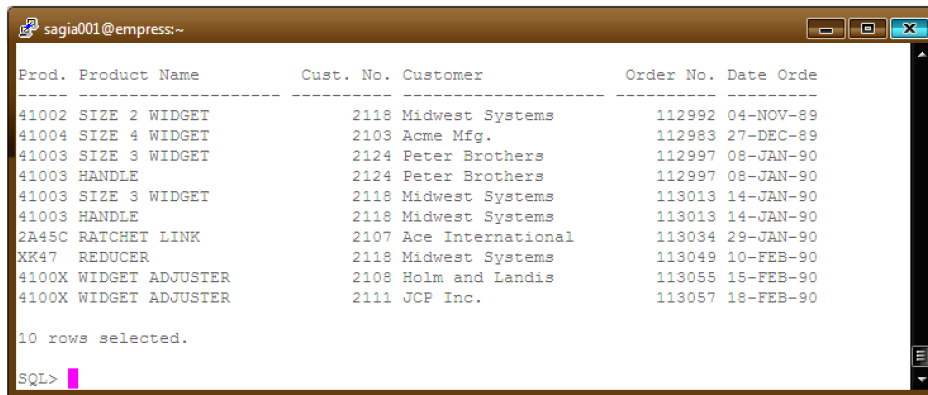
8 rows selected.

Question 9:

List all products (ProductId, and Description), customers (CustNum, Company) who have bought that product, and orders (Order Number, and Order Date) where the order < \$1000. Sort the rows by the OrderDate.

Query 9:

```
SELECT Product_ID AS "Prod.", Description AS "Product Name",
Cust_Num AS "Cust. No.", Company AS "Customer", Order_Num AS "Order No.",
Order_Date AS "Date Ordered"
FROM Products, Customer, Orders
WHERE ((Cust=Cust_Num) AND (Product=Product_ID))
AND (Amount<1000)
ORDER BY Order_Date;
```

Result 9:


Prod.	Product Name	Cust. No.	Customer	Order No.	Date Orde
41002	SIZE 2 WIDGET	2118	Midwest Systems	112992	04-NOV-89
41004	SIZE 4 WIDGET	2103	Acme Mfg.	112983	27-DEC-89
41003	SIZE 3 WIDGET	2124	Peter Brothers	112997	08-JAN-90
41003	HANDLE	2124	Peter Brothers	112997	08-JAN-90
41003	SIZE 3 WIDGET	2118	Midwest Systems	113013	14-JAN-90
41003	HANDLE	2118	Midwest Systems	113013	14-JAN-90
2A45C	RATCHET LINK	2107	Ace International	113034	29-JAN-90
XK47	REDUCER	2118	Midwest Systems	113049	10-FEB-90
4100X	WIDGET ADJUSTER	2108	Holm and Landis	113055	15-FEB-90
4100X	WIDGET ADJUSTER	2111	JCP Inc.	113057	18-FEB-90

10 rows selected.
SQL>

Question 10:

List the name of the salesreps and the name of their managers only if the manager has taken care of some orders.

Query 10:

```
SELECT DISTINCT Salesreps.Name AS "Rep. Name", Mngr.Name AS "Manager"
FROM Salesreps Rep, Salesreps Mngr, Orders
WHERE (Rep=Mngr.Empl_Num) AND (Salesreps.Manager=Mngr.Empl_Num);
```

Result 10:


Rep. Name	Manager
Tom Synder	Dan Roberts
Sue Smith	Larry Fitch
Larry Fitch	Sam Clark
Bob Smith	Sam Clark
Mary Jones	Sam Clark

SQL>