**INSY 3304 Project**

**Final**



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**Identify the entities involved in the OSI application.**

Customer, Order, Item, Truck, Employee, Driver, Sale Representative

**Define each entity using 1-2 sentences.**

***Customer***: a person or organization that buys goods or services from UFO.

***Item:*** *small part of the order.*

***Order***: any good or purchase made by the customer.

***Truck***: a large, heavy motor vehicle used for transporting the goods or order of UFO

***Employee***: a person working in the UFO who has a defined role.

***Driver***: an employee of UFO who is responsible for driving truck

***Sale Representative***: an employee of UFO responsible for taking orders.

**Create a relationship matrix to identify relationships among these entities.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Customer | Item | Employee | Order | Driver | Truck | Sales Representative |
| Customer |  |  |  | places |  |  |  |
| Item |  |  |  | is part of an |  |  |  |
| Employee |  |  |  |  | Can be |  | Can be |
| Order | is placed by | contains |  |  |  | Assigned to | Taken by |
| Driver |  |  | is a |  |  | drives |  |
| Truck |  |  |  | Ships | Assigned to |  |  |
| Sales Representative |  |  | is a | Takes a |  |  |  |

**Write business rules to describe the relationships among these entities. Each pair of business rules will have the following format:**

Each A is {sometimes | always} related to {one | one or more} B's.

Each B is {sometimes | always} related to {one | one or more} A's.

1a) Each customer always places one or more order.

1b) Each order is always placed by one customer.

2a) Each Sales Representative always takes one or more order.

2b) Each order is always taken by one sales Representative

3a) Each order always contains one or more items.

3b) Each item sometimes can be a part of one or more order.

5a) Each truck always delivers one or more order.

5b) Each order is sometimes assigned to one truck.

6a) Each driver always drives one truck.

6b) Each truck is always assigned to one driver.

Describe supertype-subtypes relationships as: A is a kind of B.

Driver is a Kind of employee.

An Employee can be a Driver.

Sales Representative is a kind of Employee.

An employee can be a Sales representative.

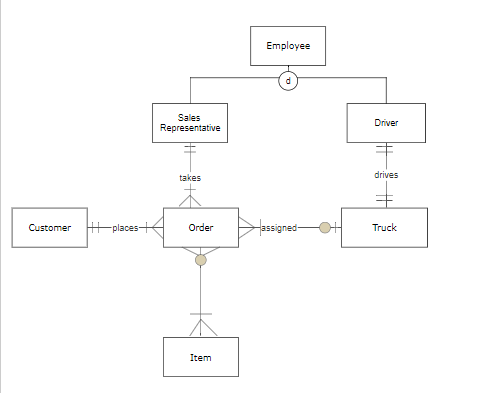
In the above-mentioned relation:

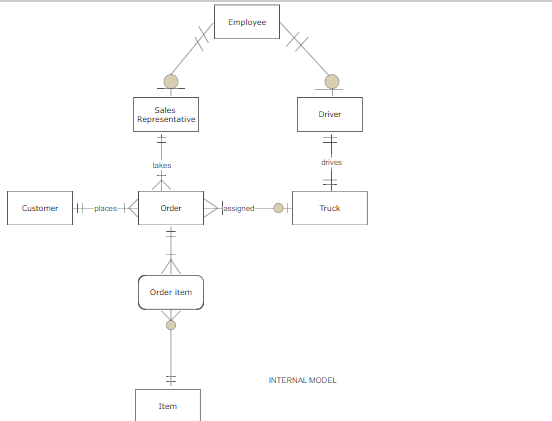
Employee 🡪 Super-Type

Driver and Sales Representative 🡪 Sub type of Employee

PART II

b. Create two E-R diagrams for the information system. One diagram should show all entities and relationships including many-to-many relationships. The second diagram will include all the entities in the first diagram. In addition, it will have bridge entities that replace many-to-many relationships. You may use Chen’s/ Crow’s foot notation. Do not list attributes on the ERDs.





Create a relational schema for your database in fourth normal form. Describe your schema using the following format. Note that primary keys are in uppercase and underlined; foreign keys are also underlined but are in lowercase. You may follow a suitable convention to identify an attribute that is both a primary key and a foreign key. Clearly indicate the convention that you follow for such attributes.

SALES\_REP (**EMP\_ID**, commission)

ORDERS (ORDER\_ID, cus\_acc\_num, emp\_id, del\_street, del\_city, del\_zip, vin, order\_status, del­\_req, order\_date)

CUSTOMER (CUS\_ACC\_NUM, cus\_lname, cus\_fname, bill\_street, bill\_city, bill\_zip, cus\_contact, contact\_person)

ItemS (Item code, item\_price, item\_qty, item\_name)

Truck (VIN, ins\_exp, regs\_exp, licence\_num, emp\_id)

Driver (**EMP\_ID**, License\_Num, License\_Exp)

EMPLOYEE (EMP\_ID, emp\_ssn, emp\_lname, emp\_fname, emp\_street, emp\_city, emp\_zip, emp\_phone, emp\_salary)

oRDER\_Item (**Order\_ID, Item\_Code,** item\_price, qty\_order)

**Note: Uppercase and bolded attributes are the one that is both a primary key and a foreign key.**

d. Create a data dictionary for your database using the format described in Table 3.6 in Coronel (pp. 75, 9 th Ed.). Make reasonable assumptions about data types and sizes for different attributes. You must specify the schema name (the user id of the account in which the tables are created) in the data dictionary.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TABLE NAME | ATTRIBUTE  NAME | CONTENTS | TYPE | REQUIRED | PK  OR  FK | FK REFERENCED TABLE |
| SALES\_REP | EMP\_ID  COMMISSION | Employee Id  Commission | Number (7)  Number(7,2) | Y | PK, FK | Employee |
| ORDERS | ORDER\_ID  CUS\_ACC\_NUM  EMP\_ID  DEL\_STREET  DEL\_CITY  DEL\_ZIP  VIN  ORDER\_STATUS  DEL\_REQ  ORDER\_DATE | Order ID  Customer Account  Employee Id  Delivery street  Delivery city  Delivery zip  Vehicle Identification Num  Order Status  Delivery Required  Order date | Number (5)  Number (6)  Number (7)  VarChar2(30)  VarChar2 (10)  Number (5)  Number (17)  Char (10)  Char (1)  Date | Y  Y  Y  Y  Y  Y  Y  Y  Y  Y | PK  FK  FK  FK | Customer  Employee  Truck |
| CUSTOMER | CUS\_ACC\_NUM  CUS\_LNAME  CUS\_FNAME  BILL\_STREET  BILL\_CITY  BILL\_ZIP  CUS\_CONTACT  CONTACT\_PERSON | Customer Account  Customer last name  Customer first name  Billing street  Billing city  Billing zip  Contact Person  Contact Person Name | Number (6)  VarChar2(15)  VarChar2(15)  VarChar2(30)  VarChar2(10)  Number (5)  Char (30)  VarChar2(20) | Y  Y  Y  Y  Y  Y | PK |  |
| ITEMS | ITEM\_CODE  ITEM\_PRICE  ITEM\_QTY  ITEM\_NAME | Item Code  Item/Unit Price  Quantity  Description | Number (6)  Number (6,2)  Number  VarChar2 (20) | Y  Y  Y  Y | PK |  |
| DRIVER | EMP\_ID  LICENSE\_NUM  LICENSE\_EXP | Employee Id  License Number  License expiration | Number (7)  Number (8)  Date | Y  Y  Y | PK,FK | Employee |
| TRUCK | VIN  INS\_EXP  REGS\_EXP  LICENSE\_NUM  EMP\_ID | Vehicle Number  Inspection Expiration  Registration expiration  License Plate Number  Employee Id | Number (17)  Date  Date  Number (5)  Number (7) | Y  Y  Y  Y  Y | PK  FK | Employee |
| EMPLOYEE | EMP\_ID  EMP\_SSN  EMP\_LNAME  EMP\_FNAME  EMP\_STREET  EMP\_CITY  EMP\_ZIP  EMP\_PHONE  EMP\_SALARY | Employee Id  Employee SSN  Employee Last Name  Employee First Name  Employee Street  Employee City  Employee Zip  Employee Phone  Employee Salary | Number (7)  Number (9)  VarChar2 (15)  VarChar2 (15)  VarChar2(30)  VarChar2(10)  Number (5)  Number (10)  Number (7,2) | Y  Y  Y  Y  Y  Y  Y  Y  Y | PK |  |
| ORDER\_ITEM | ORDER\_ID  ITEM\_CODE  ITEM\_PRICE  QTY\_ORDER | Order Id  Item Code  Item Price  Quantity Ordered | Number (5)  Number (6)  Number  Number | Y  Y  Y  Y | PK, FK  PK, FK | Order  Item |

**User: aya5583**

Create Tables in Oracle to implement the OSI database. This must be done in Omega so that I can verify your implementation. Enter about 5-8 rows in each table. **To document this part in your report, use the Describe command to list the schema of each table followed by the Select command to list its content.** **Grant Select to mahapatra on all tables.**

SQL> desc aya5583.sales\_rep;

Name Null? Type

----------------------------------------- -------- ----------------------------

EMP\_ID NOT NULL NUMBER(7)

COMMISSION NOT NULL NUMBER(7,2)

SQL> select \*

2 from aya5583.sales\_rep;

EMP\_ID COMMISSION

---------- ----------

6819049 1500

1856212 250.5

6883607 655

5175784 885

SQL> grant select on sales\_rep to mahapatra;

Grant succeeded.

SQL> desc aya5583.orders;

Name Null? Type

----------------------------------------- -------- ----------------------------

ORDER\_ID NOT NULL NUMBER(5)

CUS\_ACC\_NUM NOT NULL NUMBER(6)

EMP\_ID NOT NULL NUMBER(7)

DEL\_STREET NOT NULL VARCHAR2(30)

DEL\_CITY NOT NULL VARCHAR2(10)

DEL\_ZIP NOT NULL NUMBER(5)

VIN NOT NULL NUMBER(17)

ORDER\_STATUS NOT NULL CHAR(10)

DEL\_REQ NOT NULL CHAR(1)

ORDER\_DATE NOT NULL DATE

SQL> select \*

2 from aya5583.orders;

ORDER\_ID CUS\_ACC\_NUM EMP\_ID DEL\_STREET DEL\_CITY

---------- ----------- ---------- ------------------------------ ----------

DEL\_ZIP VIN ORDER\_STAT D ORDER\_DAT

---------- ---------- ---------- - ---------

46312 12345 6883607 724 washington dr arlington

76011 3336666 Y Y 21-DEC-17

54102 12346 5175784 719 Central Dr Dallas

76012 2223333 Y N 22-DEC-17

66132 12347 1856212 582 New York Ave Haslet

76013 1114444 N Y 23-DEC-17

ORDER\_ID CUS\_ACC\_NUM EMP\_ID DEL\_STREET DEL\_CITY

---------- ----------- ---------- ------------------------------ ----------

DEL\_ZIP VIN ORDER\_STAT D ORDER\_DAT

---------- ---------- ---------- - ---------

34801 12349 6819049 718 West Dr Irving

76015 5552222 Y Y 24-DEC-17

45123 12348 6883607 817 North Ave New york

76014 9991111 N N 23-DEC-17

SQL> grant select on orders to mahapatra;

Grant succeeded

SQL> desc aya5583.customer;

Name Null? Type

----------------------------------------- -------- ----------------------------

CUS\_ACC\_NUM NOT NULL NUMBER(6)

CUS\_LNAME NOT NULL VARCHAR2(15)

CUS\_FNAME NOT NULL VARCHAR2(15)

BILL\_STREET NOT NULL VARCHAR2(30)

BILL\_CITY NOT NULL VARCHAR2(10)

BILL\_ZIP NOT NULL NUMBER(5)

CUS\_CONTACT CHAR(30)

CONTACT\_PERSON VARCHAR2(20)

SQL> select \*

2 from aya5583.customer;

CUS\_ACC\_NUM CUS\_LNAME CUS\_FNAME BILL\_STREET

----------- --------------- --------------- ------------------------------

BILL\_CITY BILL\_ZIP CUS\_CONTACT CONTACT\_PERSON

---------- ---------- ------------------------------ --------------------

12345 Dalton Waylon 123 6th st

Melbourne

Mckenney 32904 4681234567 Tom Harris

12346 Henderson Justine 71 Pilgrim Avenue Chevy Chase

Irving 20815 4699872865 Jim Cruise

12347 Lang Abdullah 70 Bowman St South Windsor

Arlington 75074 4568761234 Jones Thomas

CUS\_ACC\_NUM CUS\_LNAME CUS\_FNAME BILL\_STREET

----------- --------------- --------------- ------------------------------

BILL\_CITY BILL\_ZIP CUS\_CONTACT CONTACT\_PERSON

---------- ---------- ------------------------------ --------------------

12348 Cruz Marcus 4 Goldfield Rd Honululu

Dallas 96815 4694567891 Kamal Feriz

12349 Cobb Thalia 44 Shirley Ave West Chicago

Garland 60185 4696546789 Alex Dcruz

SQL> grant select on customer to mahapatra

2 ;

Grant succeeded.

SQL> desc aya5583.items

Name Null? Type

----------------------------------------- -------- ----------------------------

ITEM\_CODE NOT NULL NUMBER(6)

ITEM\_PRICE NOT NULL NUMBER(6,2)

ITEM\_QTY NOT NULL NUMBER

ITEM\_NAME NOT NULL VARCHAR2(20)

SQL> select \*

2 from aya5583.items;

ITEM\_CODE ITEM\_PRICE ITEM\_QTY ITEM\_NAME

---------- ---------- ---------- --------------------

486712 45.6 100 Printer Paper

235786 3.99 5000 Black pen

123890 99.85 100 Paper Clips

896456 530.99 50 Printer

340986 5.99 200 Highlighter

236900 23.85 150 Calculator

6 rows selected.

SQL> grant select on items to mahapatra;

Grant succeeded.

SQL> desc aya5583.driver

Name Null? Type

----------------------------------------- -------- ----------------------------

EMP\_ID NOT NULL NUMBER(7)

LICENSE\_NUM NOT NULL NUMBER(8)

LICENSE\_EXP NOT NULL DATE

SQL> select \*

2 from aya5583.driver;

EMP\_ID LICENSE\_NUM LICENSE\_E

---------- ----------- ---------

6183607 22223333 02-FEB-17

1398795 44445555 22-DEC-19

2005995 99992222 03-SEP-20

4914975 11115555 25-NOV-25

SQL> grant select on driver to mahapatra;

Grant succeeded.

SQL> desc aya5583.truck;

Name Null? Type

----------------------------------------- -------- ----------------------------

VIN NOT NULL NUMBER(17)

INS\_EXP NOT NULL DATE

REGS\_EXP NOT NULL DATE

LICENCE\_NUM NOT NULL NUMBER(5)

EMP\_ID NOT NULL NUMBER(7)

SQL> select \*

2 from aya5583.truck;

VIN INS\_EXP REGS\_EXP LICENCE\_NUM EMP\_ID

---------- --------- --------- ----------- ----------

3336666 06-DEC-17 12-DEC-17 99999 6183607

2223333 20-JAN-17 11-NOV-17 88888 1398795

1114444 13-FEB-17 15-OCT-17 77777 2005995

9991111 01-MAR-17 18-SEP-17 66666 4914975

5552222 04-MAY-17 25-JUN-17 44444 1398795

SQL> grant select on truck to mahapatra;

Grant succeeded.

SQL> desc aya5583.employee;

Name Null? Type

----------------------------------------- -------- ----------------------------

EMP\_ID NOT NULL NUMBER(7)

EMP\_SSN NOT NULL NUMBER(9)

EMP\_LNAME NOT NULL VARCHAR2(15)

EMP\_FNAME NOT NULL VARCHAR2(15)

EMP\_STREET NOT NULL VARCHAR2(30)

EMP\_CITY NOT NULL VARCHAR2(10)

EMP\_ZIP NOT NULL NUMBER(5)

EMP\_PHONE NOT NULL NUMBER(10)

EMP\_SALARY NOT NULL NUMBER(7,2)

SQL> select \*

2 from aya5583.employee;

EMP\_ID EMP\_SSN EMP\_LNAME EMP\_FNAME

---------- ---------- --------------- ---------------

EMP\_STREET EMP\_CITY EMP\_ZIP EMP\_PHONE EMP\_SALARY

------------------------------ ---------- ---------- ---------- ----------

6183607 620942345 White Carolin

24 green oak Irving 62035 2313722840 75000

5175784 476194960 Smith Robert

3 Wagon Court Addison 37205 5206226612 38000

1398795 777890889 Mooy David

782 Middle River Irving 28601 2147688133 45600

EMP\_ID EMP\_SSN EMP\_LNAME EMP\_FNAME

---------- ---------- --------------- ---------------

EMP\_STREET EMP\_CITY EMP\_ZIP EMP\_PHONE EMP\_SALARY

------------------------------ ---------- ---------- ---------- ----------

2005995 627099672 Serling Sarah

7456 Hight St Rock Hill 29730 5085724605 75500

6819049 176936854 Bucci Esther

91 Helen St Arlington 36101 4242716934 45000

4914975 641132311 Litton Joseph

Honey Lane Arlington 36101 4246336206 55000

EMP\_ID EMP\_SSN EMP\_LNAME EMP\_FNAME

---------- ---------- --------------- ---------------

EMP\_STREET EMP\_CITY EMP\_ZIP EMP\_PHONE EMP\_SALARY

------------------------------ ---------- ---------- ---------- ----------

6883607 999714107 Wellons Ruth

854 Glen Creek Irving 28601 2065084375 66000

1856212 856456325 Claude De Gaule

208 Marshall Ln Murphy 16879 3854581268 49750

8 rows selected.

SQL> grant select on employee to mahapatra;

Grant succeeded.

SQL> desc aya5583.order\_item;

Name Null? Type

----------------------------------------- -------- ----------------------------

ORDER\_ID NOT NULL NUMBER(5)

ITEM\_CODE NOT NULL NUMBER(6)

ITEM\_PRICE NOT NULL NUMBER

QTY\_ORDER NOT NULL NUMBER

SQL> select \*

2 from aya5583.order\_item;

ORDER\_ID ITEM\_CODE ITEM\_PRICE QTY\_ORDER

---------- ---------- ---------- ----------

46312 486712 45.6 3

54102 235786 3.99 1

66132 123890 99.85 1

45123 896456 530.99 10

34801 340986 5.99 15

SQL> grant select on order\_item to mahapatra;

Grant succeeded.

f. Execute the following queries using SQL: (20%)

1. List all customer names, addresses, contact person names and phone numbers.

SQL> select cus\_fname, cus\_lname, bill\_street, bill\_city, cus\_contact, contact\_person

2 from aya5583.customer;

CUS\_FNAME CUS\_LNAME BILL\_STREET BILL\_CITY

--------------- --------------- ------------------------------ ----------

CUS\_CONTACT CONTACT\_PERSON

------------------------------ --------------------

Waylon Dalton 123 6th st Mckenney

Melbourne

4681234567 Tom Harris

Justine Henderson 71 Pilgrim Avenue Chevy Chase Irving

4699872865 Jim Cruise

Abdullah Lang 70 Bowman St South Windsor Arlington

4568761234 Jones Thomas

CUS\_FNAME CUS\_LNAME BILL\_STREET BILL\_CITY

--------------- --------------- ------------------------------ ----------

CUS\_CONTACT CONTACT\_PERSON

------------------------------ --------------------

Marcus Cruz 4 Goldfield Rd Honululu Dallas

4694567891 Kamal Feriz

Thalia Cobb 44 Shirley Ave West Chicago Garland

4696546789 Alex Dcruz

2. Pick an order, and get all the information about that order that are included on the order form. You don’t need to compute the taxes and the totals. This query may be split into two sql statements.

We divided this question into two parts which contains the header part of info and body part of calculation.

Part 1

SQL> select o.order\_id, o.del\_street, o.del\_city, o.del\_zip, e.emp\_lname, e.emp\_fname, c.cus\_acc\_num, c.cus\_lname, c.cus\_fname, c.contact\_person, c.bill\_street, c.bill\_city, c.bill\_zip

2 from aya5583.orders o , aya5583.customer c, aya5583.employee e

3 where o.order\_id = '46312'

4 and o.cus\_acc\_num = c.cus\_acc\_num

5 and o.emp\_id = e.emp\_id;

ORDER\_ID DEL\_STREET DEL\_CITY DEL\_ZIP EMP\_LNAME

---------- ------------------------------ ---------- ---------- ---------------

EMP\_FNAME CUS\_ACC\_NUM CUS\_LNAME CUS\_FNAME CONTACT\_PERSON

--------------- ----------- --------------- --------------- --------------------

BILL\_STREET BILL\_CITY BILL\_ZIP

------------------------------ ---------- ----------

46312 724 washington dr arlington 76011 Wellons

Ruth 12345 Dalton Waylon Tom Harris

123 6th st Mckenney 32904

Melbourne

**Part 2**

SQL> select o.item\_code, i.item\_name, o.qty\_order, o.item\_price"Unit\_Price", o.item\_price\*o.qty\_order"Extended\_Price"

2 from aya5583.items i, aya5583.order\_item o

3 where o.order\_id = '46312'

4 and o.item\_code = i.item\_code;

ITEM\_CODE ITEM\_NAME QTY\_ORDER Unit\_Price Extended\_Price

---------- -------------------- ---------- ---------- --------------

486712 Printer Paper 3 45.6 136.8

3. What is the phone number of the sales rep who took order in the query above?

SQL> select emp\_phone

2 from aya5583.employee,aya5583.orders

3 where orders.order\_id = '46312'

4 and employee.emp\_id = orders.emp\_id;

EMP\_PHONE

----------

2065084375

Was not sure which one you wanted we can get same output from two different sql query

SQL> select emp\_phone

2 from aya5583.employee, aya5583.orders, aya5583.sales\_rep

3 where orders.order\_id = '46312'

4 and employee.emp\_id = orders.emp\_id

5 and employee.emp\_id = sales\_rep.emp\_id;

EMP\_PHONE

----------

2065084375

4. Pick a driver and list all orders (order numbers only) delivered by him/her.

SQL> select order\_id

2 from aya5583.orders, aya5583.driver, aya5583.truck

3 where driver.emp\_id = '6183607'

4 and truck.vin = orders.vin

5 and truck.emp\_id = driver.emp\_id;

ORDER\_ID

----------

46312

5. What is the total value of all inventory items that have unit prices exceeding $25?

SQL> select sum(item\_qty \* item\_price)"Total Value"

2 from aya5583.items

3 where item\_price > 25;

Total Value

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41094.5