**INSY 5335 001**

**APPLIED DATABASE MANAGEMENT**

**Spring 2022**

**Project report submission**

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**Project report submission**

# **Part I**

**Identify the entities in the UFO application. List each entity with a short definition. Note you need to underline the attribute used as the primary key:**

Ans: **ENTITIES:**

1. Customer (customer\_id, customer\_name, billing\_address,phone\_number);

Customer entity is used to store details of customers of UFO company.

1. Furniture (item\_code, price, quantity\_stock, product\_desc);

Furniture entity is used to store details of items sold by Universal Furniture Outlet (UFO).

1. Orders (order\_id, employee\_SSN, customer\_id, customer\_delivery\_address, item\_code, order\_quantity, total\_price, ufo\_delivery, delivery\_fee, grand\_total);

Orders entity stores details of the orders received by UFO.

1. Employee (emp\_SSN, emp\_name, emp\_address, emp\_phone, salary, emp\_type, commission, dl\_no, dl\_exp,);

Employee entity stores details of the employees working at UFO.

1. Truck (vehicle\_no, license\_plate\_no, license\_exp\_date, inspection\_exp, emp\_SSN);

Truck entity stores details of the vehicles used by UFO.

1. Shipment (shipment\_id, order\_id, vehicle\_no, emp\_SSN);

Shipment entity stores details of the vehicles used by UFO.

1. Order\_memo (order\_id, item\_code, item\_date);

This is an association entity, which is introduced later, it stores details of the association between the orders and furniture entities.

**Write business rules to describe the relationships among these entities:**

Ans:

1. Each customer places one or more orders.
2. Each order is placed by only one customer.
3. Each order contains one or more furniture items.
4. Each furniture item is contained by zero or more orders.
5. Each order is divided into one or more shipments.
6. Each shipment is made up of one order.
7. Each shipment is assigned to one truck.
8. Each truck can have one or more shipments.
9. Each truck is driven by one driver who is an employee.
10. Each driver who is an employee drives only one truck.
11. Each shipment is planned by operations manager who is an employee.
12. Each operations manager who is an employee plans one or more shipments.
13. Each order is handled by one sales representative who is an employee.
14. Each employee who is a sales representative handles one or more orders.

**Describe supertype-subtypes relationships:**

Ans:

1. Operations manager is a kind of employee.
2. Employee can be an operations manager.
3. Driver is a kind of employee.
4. Employee can be a driver.
5. Sales representative is a kind of employee.
6. Employee can be a sales representative.

# **Part II**

## **Create two E-R diagrams for the information system using Crow’s foot notation. 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 associative entities that replace many-to-many relationships**.

Ans:

**Diagram

Description automatically generated****Diagram 1:** E-R diagram using Crow foot’s notation, showing all entities and relationships including many-to-many relationships:

**Diagram 2**: E-R diagram to include all the entities in the first diagram. In addition, it has associative entities that replace many-to-many relationships.

Explanation: The many to many relationship between ‘Order’ and ‘Furniture’ is replaced by associative entity named ‘Order\_memo’. Hence, as per the rules, order\_memo entity uses PK of order\_id (‘Order’ table) and item\_code (‘Furniture’ table), along with an additional property introduced for this association ‘order\_date’ on which order was placed.

**Diagram

Description automatically generated**

## **Create a relational schema for your database in third normal form. Describe your schema using the following format. Note that primary keys and foreign keys should be denoted (i.e., having pk, fk before the attribute names) and underlined. If an attribute is both a primary key and a foreign key, put both pk and fk before it.**

Ans: Below is the relational schema diagram for our database in third normal form. All the PK & FK are underlined.

**Diagram

Description automatically generated**

## **Create a data dictionary for your database using the format described in Table 3.6 in Coronel & Morris (pp. 88, 13th Ed.). Make reasonable assumptions about data types and sizes for different attributes. You must specify the schema name (the userid of the account in which the tables are created) in the data dictionary.**

Ans: Schema name and details: ssk7315

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## **Create Tables in Oracle to implement the UFO database. This must be done in your UTA Oracle account 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 your instructor and the TA on all tables.**

**Ans:**

1. describe command on each table in our project:

DESC truck;

Graphical user interface, text, application, email

Description automatically generated

DESC shipment;

Graphical user interface, application

Description automatically generated

DESC orders;

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Description automatically generated

DESC furniture;

Graphical user interface, application

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DESC EMPLOYEE;

Graphical user interface, application

Description automatically generated

DESC customer\_project;

Graphical user interface, application

Description automatically generated

DESC order\_memo;

Graphical user interface

Description automatically generated with low confidence

1. select command on each table in our project

SELECT \* FROM truck;

Table

Description automatically generated

SELECT \* FROM SHIPMENT;

Table

Description automatically generated

SELECT \* FROM ORDERS;

Table

Description automatically generated

SELECT \* FROM furniture;

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Description automatically generated

SELECT \* FROM EMPLOYEE;

Table

Description automatically generated

SELECT \* FROM customer\_project;

Table

Description automatically generated

SELECT \* FROM order\_memo;

Graphical user interface, application

Description automatically generated

1. grant command to Professor and TA on each table in our project, we have provided select access to the below users.

grant select on customer\_project to guz,nairs5 ;

grant select on employee to guz,nairs5 ;

grant select on furniture to guz,nairs5 ;

grant select on orders to guz,nairs5 ;

grant select on truck to guz,nairs5 ;

grant select on shipment to guz,nairs5 ;

grant select on order\_memo to guz,nairs5 ;

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## **Execute the following queries using SQL.**

### List all customer names, addresses, and phone numbers.

|  |
| --- |
| select customer\_name as "Customer Name",  billing\_address\_line|| ', ' || city || ', '|| addr\_state|| ', ' || zip as "Customer Address", phone\_number as "Cutomer Phone Number"  from customer\_project; |

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### Pick an order, and get all information about that order included in the order form. You don’t need to compute the totals and the delivery fee. This may be split into two queries, one for the header and the other for the order lines.

|  |
| --- |
| --header query  select order\_id as "Order Number",  employee\_name as "Sales Rep Name",  customer\_project.customer\_id as "Customer Account",  customer\_name as "Customer Name",  billing\_address\_line|| ', ' || customer\_project.city || ', '|| customer\_project.addr\_state|| ', ' || customer\_project.zip as "Billing Address",  customer\_del\_address\_line|| ', ' || orders.city || ', '|| orders.addr\_state|| ', ' || orders.zip as "Delivery Address"  from orders,customer\_project,employee  where orders.customer\_id = customer\_project.customer\_id  and orders.employee\_ssn= employee.employee\_ssn and  order\_id =1; |

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|  |
| --- |
| --order lines query  select furniture.item\_code as "Furniture ID",  product\_desc as "Description",  order\_quantity as "Quantity",  price as "Unit Space Price",  price\*order\_quantity as "Extended Price"  from orders, furniture  where orders.item\_code= furniture.item\_code  and order\_id =1; |

A picture containing table

Description automatically generated

### What is the phone number of the salesrep who took order in the query above?

|  |
| --- |
| select employee\_phone as "Employee Phone Number"  from orders,employee  where orders.employee\_ssn= employee.employee\_ssn and  order\_id =1; |

Graphical user interface, application

Description automatically generated

### Pick a driver and list all customers whose orders have been delivered by him/her.

|  |
| --- |
| select orders.customer\_id as "Customer Account",  customer\_name as "Customer Name",  billing\_address\_line|| ', ' || customer\_project.city || ', '|| customer\_project.addr\_state|| ', ' || customer\_project.zip as "Billing Address"  from shipment,orders,customer\_project,truck  where shipment.order\_id = orders.order\_id and  orders.customer\_id = customer\_project.customer\_id and  truck.vehicle\_no = shipment.vehicle\_no and  truck.employee\_ssn=1500; |

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### What is the total value (quantity time unit price) of all items in stock that have unit prices exceeding $25?

|  |
| --- |
| select price\*quantity\_stock as "Total value"  from furniture  where price > 25 and quantity\_stock >0; |

Graphical user interface, text, application, email

Description automatically generated