FACULTY COLLEGE OF INFORMATION TECHNOLOGY

Database Systems - Project   
Inventory MANAGEMENT SYSTEM

**SUBMITTED BY:**

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**Introduction to the working of the system**

# **Define Problems and Constraints**

The company **XYZ** has one of the **distributer** in Lahore , he has started the business throughout the country. His business has warehouse which stores the incoming products and supply the ordered products to the customers.

They have their own office , there they deal with customers and suppliers.

The distributer purchases products from company and then sale to those customers who have ordered for.This whole cycle is managed by employees, salespersons etc.

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# **Define Objectives**

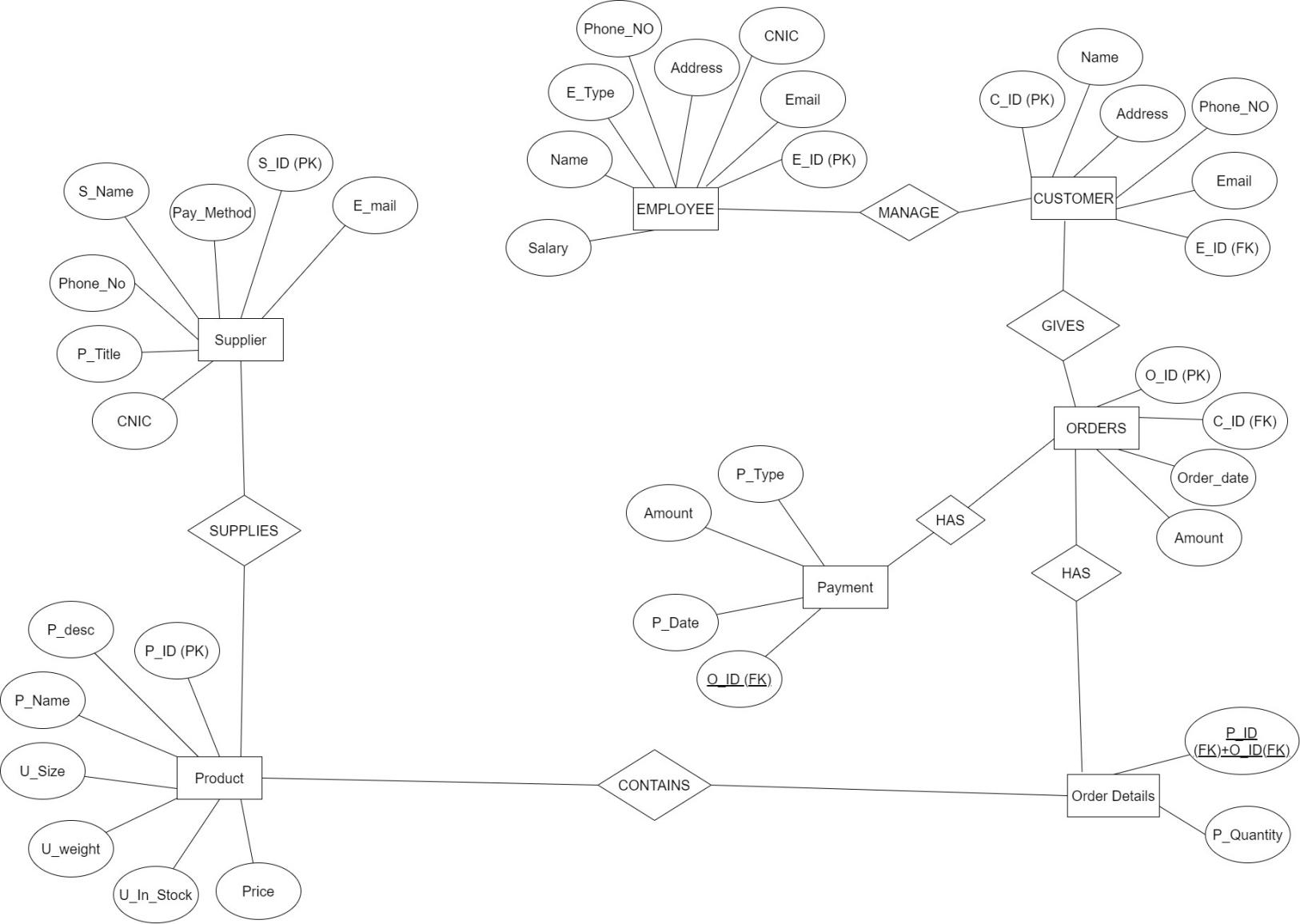
Our **objective** is to create the database for their business to keep detailed **record of all incoming/ outgoing** products.

This will store the records of all supplier and customers.

This system will also keep record of order for products and the company’s employees which will manage the orders. The employee will also assemble the products in warehouse and this record will also be stored.

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### Entity – Relationship Diagram of system:

The following Entity-Relationship Diagram (ERD) represents the relationships of different entities in this database system   
  


CONVERTING ERD MODEL INTO RELATIONAL MODEL:  
  
**CUSTOMER (** C\_ID , Name , Address , Phone\_NO , Email , E\_ID (FK) )

**EMPLOYEE (** E\_ID , Email , CNIC , Address , Phone\_NO , E\_Type **,** Name , Salary )   
**ORDER DETAIL (** O\_ID (FK) + P\_ID (FK) , P\_Quantity )  
 **ORDERS** ( O\_ID , C\_ID , Order\_Date ,Amount )   
**PAYMENT** (O\_ID(FK) , Date , Amount , P\_Type )  
**PRODUCT** (P\_ ID , P\_desc , P\_Name , U\_Size , U\_weight , U\_In\_Stock ,Price)

**SUPPLIER** ( S\_ID , S\_Name , Phone\_NO , Email ,CNIC , P\_Title , Pay\_Method )

CONVERTING RELATIONAL MODEL TO 3RD NORMAL FORM:

**CUSTOMER (** C\_ID , Name , Address , Phone\_NO , Email,E\_ID (FK) )

**EMPLOYEE (** E\_ID , Email , CNIC , Address , Phone\_NO , E\_Type **,** Name , Salary )   
**ORDER DETAIL (** O\_ID (FK) + P\_ID (FK) , P\_Quantity )  
 **ORDERS** ( O\_ID , C\_ID , Order\_Date ,Amount )   
**PAYMENT** ( O\_ID(FK) , Date , Amount , P\_Type )

**PRODUCT** (P\_ ID , P\_desc , P\_Name , U\_Size , U\_weight , U\_In\_Stock ,Price )

**SUPPLY DETAILS** ( P\_ID (FK) + S\_ID , Pay\_Method )

# **SUPPLIER** ( S\_ID , S\_Name , Phone\_NO , Email ,CNIC , P\_Title ) Untitled Diagram (1) Connectivity Table

|  |  |  |  |
| --- | --- | --- | --- |
| **ENTITY** | **RELATIONSHIP** | **CONNECTIVITY** | **ENTITY** |
| CUSTOMER | MANAGE | M:0 || 1:1 | EMPLOYEE |
| EMPLOYEE | TAKES | M:1 || 1:0 | ORDERS |
| ORDER DETAIL | CONTAINS | 1:1 || M:1 | PRODUCT |
| SUPPLY DETAIL | UPDATES | M:1 || 1:1 | SUPPLIER |
| SUPPLY DETAIL | SUPPLIES | M:1 || 1:1 | PRODUCT |
| CUSTOMER | GIVES | 1:1 || M:0 | ORDER |
| ORDERS | HAS | 1:1 || 1:1 | ORDER DETAIL |
| ORDERS | HAS | 1:1 || 1:1 | PAYMENT |

**Table Name: CUSTOMER**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| C\_ID | NUMBER | 4 | PRIMARY KEY |
| Name | VARCHAR2 | 20 | NOT NULL |
| Address | VARCHAR2 | 50 | NOT NULL |
| Phone\_NO | NUMBER | 13 | NOT NULL |
| Email | VARCHAR2 | 20 | NOT NULL |
| E\_ID | NUMBER | 4 | FOREIGN KEY REFERANCES EMPLOYEE |

**Table Name: EMPLOYEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| E\_ID | NUMBER | 4 | PRIMARY KEY |
| Email | VARCHAR2 | 20 | NOT NULL |
| CNIC | NUMBER | 13 | NOT NULL |
| Address | VARCHAR2 | 50 | NOT NULL |
| Phone\_NO | NUMBER | 13 | NOT NULL |
| E\_Type | VARCHAR2 | 15 | NOT NULL |
| Name | VARCHAR2 | 20 | NOT NULL |
| Salary | NUMBER | 8 | NOT NULL |

**Table Name: ORDERS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| O\_ID | NUMBER | 4 | PRIMARY KEY |
| C\_ID | NUMBER | 4 | FOREIGN KEY REFERANCES CUSTOMER |
| Order\_Date | DATE |  | NOT NULL |

**Table Name: ORDER DETAIL**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| O\_ID | NUMBER | 4 | PRIMARY KEY, FK REFERANCES ORDERS |
| P\_ID | NUMBER | 4 | PRIMARY KEY, FK REFERANCES PRODUCT |
| P\_Quantity | NUMBER | 5 | NOT NULL |

**Table Name: PAYMENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| O\_ID | NUMBER | 4 | PRIMARY KEY , UNIQUE |
| P\_Date | DATE |  | NOT NULL |
| Amount | NUMBER | 8 | NOT NULL |
| P\_Type | CHAR | 2 | NOT NULL |

**Table Name: PRODUCT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| P\_ID | NUMBER | 4 | PRIMARY KEY |
| P\_desc | VARCHAR2 | 200 | NONE |
| P\_Name | VARCHAR2 | 20 | NOT NULL |
| U\_Size | NUMBER | 4 | NOT NULL |
| U\_weight | NUMBER | 4 | NOT NULL |
| U\_In\_Stock | NUMBER | 6 | NOT NULL |
| Price | NUMBER | 5 | NOT NULL |

**Table Name: SUPPLY DETAILS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| P\_ID | NUMBER | 4 | PRIMARY KEY ,FK REFERANCES PRODUCT |
| S\_ID | NUMBER | 4 | PRIMARY KEY ,FK REFERANCES SUPPLIER |
| Pay\_Method | VARCHAR2 | 10 | NOT NULL |

**Table Name: SUPPLIER**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Data Type** | **Size** | **Constraints** |
| S\_ID | NUMBER | 4 | PRIMARY KEY |
| S\_Name | VARCHAR2 | 20 | NOT NULL |
| Phone\_NO | NUMBER | 13 | NOT NULL |
| Email | VARCHAR2 | 20 | NOT NULL |
| CNIC | VARCHAR2 | 13 | NOT NULL |
| P\_Title | VARCHAR2 | 20 | NOT NULL |

**6. CREATE TABLE statements for all the relations of your system.**

**CUSTOMER:**

CREATE TABLE CUSTOMER(

C\_ID NUMBER(4) ,

Name VARCHAR2(20) NOT NULL,

Address VARCHAR2(50) NOT NULL,

Phone\_No NUMBER(13) NOT NULL,

Email VARCHAR2(20) NOT NULL,

E\_ID NUMBER (4) NOT NULL,

CONSTRAINT CUST\_P PRIMARY KEY (C\_ID),

CONSTRAINT CUST\_F FOREIGN KEY(E\_ID) REFERENCES Employee(E\_ID)

);

**EMPLOYEE:**

CREATE TABLE EMPLOYEE(

E\_ID NUMBER(4) ,

Email VARCHAR2(20) NOT NULL,

CNIC NUMBER(13) NOT NULL,

Address VARCHAR2(50) NOT NULL,

Phone\_NO NUMBER (13) NOT NULL,

E\_Type VARCHAR2(15) NOT NULL,

Name VARCHAR2(20) NOT NULL,

Salary NUMBER(8) NOT NULL,

CONSTRAINT E\_P PRIMARY KEY(E\_ID)

);

**ORDERS:**

CREATE TABLE ORDERS(

O\_ID NUMBER(4),

C\_ID NUMBER(4) NOT NULL,

Order\_Date DATE NOT NULL,

CONSTRAINT O\_P PRIMARY KEY(O\_ID),

CONSTRAINT O\_F FOREIGN KEY(C\_ID) REFERENCES CUSTOMER(C\_ID)

);

**PRODUCT**

CREATE TABLE PRODUCT(

P\_ID NUMBER(4) ,

P\_Desc VARCHAR2(200),

P\_Name VARCHAR2(20) NOT NULL,

U\_Size NUMBER(4) NOT NULL,

U\_weight NUMBER(4) NOT NULL,

U\_In\_Stock NUMBER(6) NOT NULL ,

Price NUMBER(5) NOT NULL

CONSTRAINT P\_P PRIMARY KEY(P\_ID)

);

**ORDER\_DETAIL**

CREATE TABLE ORDER\_DETAIL(

O\_ID NUMBER(4) ,

P\_ID NUMBER(4) ,

P\_Quantity VARCHAR2(5) NOT NULL,

CONSTRAINT OD\_P PRIMARY KEY (O\_ID, P\_ID),

CONSTRAINT OD\_F2 FOREIGN KEY(O\_ID) REFERENCES ORDERS(O\_ID),

CONSTRAINT OD\_F3 FOREIGN KEY(P\_ID) REFERENCES PRODUCT(P\_ID)

);

**PAYMENT**

CREATE TABLE PAYMENT(

O\_ID NUMBER(4) UNIQUE,

P\_Date DATE NOT NULL,

Amount NUMBER(8) NOT NULL ,

P\_Type CHAR(2) NOT NULL,

CONSTRAINT O\_P PRIMARY KEY(O\_ID)

);

**SUPPLIER**

CREATE TABLE SUPPLIER(

S\_ID NUMBER(4) PRIMARY KEY,

S\_Name VARCHAR2(20) NOT NULL,

Phone\_NO NUMBER(13) NOT NULL ,

Email VARCHAR2(20) NOT NULL,

CNIC VARCHAR2(13) NOT NULL,

P\_Title VARCHAR2(20) NOT NULL

);

**SUPPLIER DETAIL**

CREATE TABLE SUPPLIER\_DETAIL(

P\_ID NUMBER(4) ,

S\_ID NUMBER(4),

Pay\_Method VARCHAR2(10) NOT NULL ,

CONSTRAINT SD\_P PRIMARY KEY (P\_ID,S\_ID),

CONSTRAINT SD\_F1 FOREIGN KEY(P\_ID) REFERENCES PRODUCT(P\_ID),

CONSTRAINT SD\_F2 FOREIGN KEY(S\_ID) REFERENCES SUPPLIER(S\_ID)

);

**INSERTION QUERIES**

**EMPLOYEE**

INSERT INTO EMPLOYEE

VALUES(001,'shazil123@gmail.com',3520257929019, 'house 1 lahore ', 0333312343, ‘SALESPERSON’, 'shazil',10000)

INSERT INTO EMPLOYEE

VALUES(2,'abbas123@gmail.com',3520257929029, 'house 2 lahore ', 0333322343, ‘MANAGER’, 'abbas',100000)

INSERT INTO EMPLOYEE

VALUES(3,'asim123@gmail.com',3520257929039, 'house 3 lahore ', 0333332343, ‘SALESPERSON’, 'asim',120000)

**CUSTOMER**

INSERT INTO CUSTOMER

VALUES(100,'ALI', 'house 100 lahore ', 0233312343 , 'ALI1@GMAIL.COM',1)

INSERT INTO CUSTOMER

VALUES(101,'ALI1', 'house 101 lahore ', 0243312343 , 'ALI2@GMAIL.COM',1)

INSERT INTO CUSTOMER

VALUES(102,'ALI2', 'house 102 lahore ', 0253312343 , 'ALI3@GMAIL.COM',1)

INSERT INTO CUSTOMER

VALUES(102,'ALI2', 'house 102 lahore ', 0253312343 , 'ALI3@GMAIL.COM',1)

INSERT INTO CUSTOMER

VALUES(102,'ALI2', 'house 102 lahore ', 0253312343 , 'ALI3@GMAIL.COM',1)

INSERT INTO CUSTOMER

VALUES(103,'ALI3', 'house 103 lahore ', 02543312343 , 'ALI3@GMAIL.COM',3)

**ORDERS**

INSERT INTO ORDERS

VALUES(1001,'100', '01/06/2022')

INSERT INTO ORDERS

VALUES(1002,'101', '02/06/2022')

INSERT INTO ORDERS

VALUES(1003,'102', '03/06/2022')

INSERT INTO ORDERS

VALUES(1004,'103', '04/06/2022')

**PRODUCT**

INSERT INTO PRODUCT

VALUES(50,'100% Original 5 Amp Power Supply 12V','Amp Power Supply',20,10,100 )

INSERT INTO PRODUCT

VALUES(51,'90% Original 5 Amp Power Supply 10V','Amp Power Supply2',20,10,100 )

INSERT INTO PRODUCT

VALUES(52,'80% Original 5 Amp Power Supply 8V','Amp Power Supply3',20,10,100 )

**ORDER\_DETAILS**

INSERT INTO ORDER\_DETAIL

VALUES(1001,50, 50 )

INSERT INTO ORDER\_DETAIL

VALUES(1002,51, 50 )

INSERT INTO ORDER\_DETAIL

VALUES(1003,51, 30 )

INSERT INTO ORDER\_DETAIL

VALUES(1004,52, 70 )

**PAYMENT**

INSERT INTO PAYMENT

VALUES(1001,'01/02/2020', 500 ,'Rs')

INSERT INTO PAYMENT

VALUES(1002,'02/02/2020', 750 ,'Rs')

INSERT INTO PAYMENTselect \* from payment

VALUES(1003,'03/02/2020', 1500 ,'Rs')

INSERT INTO PAYMENT

VALUES(1004,'04/02/2020', 1400 ,'Rs' )

**SUPPLIER**

INSERT INTO SUPPLIER

VALUES(2001,'HAFIZ',03334247932,'HAFIZ@GMAIL.COM',3520202686876,'Amp Power Supply' )

INSERT INTO SUPPLIER

VALUES(2002,'AHMED',03334247982,'AHMED@GMAIL.COM',35202086877,'Amp Power Supply2' )

INSERT INTO SUPPLIER

VALUES(2003,'SUNNY',0334247983,'SUNNY@GMAIL.COM',3520202686878,'Amp Power Supply3' )

**SUPPLIER DETAIL**

INSERT INTO SUPPLIER\_DETAIL

VALUES(50,2001,'CASH' )

INSERT INTO SUPPLIER\_DETAIL

VALUES(51,2002,'CASH' )

INSERT INTO SUPPLIER\_DETAIL

VALUES(52,2003,'CREDIT ‘)  
Q-7 ASSOCIATION AMONG RELATIONAL DATA MODEL :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CUSTOMER** | C\_ID | Name | Address | Phone\_NO | Email |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EMPLOYEE** | E\_ID | Email , | CNIC | Address | Phone\_NO | E\_Type | Name | Salary |

|  |  |  |
| --- | --- | --- |
| **ORDER DETAIL** | O\_ID(FK) + P\_ID FK) | P\_Quantity |

|  |  |  |  |
| --- | --- | --- | --- |
| **ORDER** | O\_ID | C\_ID | Order\_Date |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PAYMENT** | Pay\_ID | Date | Amount | P\_Type | O\_ID |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **PRODUCT** | P\_ ID | P\_desc | P\_Name | U\_Size | U\_weight | U\_In\_Stock |

|  |  |  |  |
| --- | --- | --- | --- |
| **SUPPLY DETAILS** | P\_ID (FK) + S\_ID | U\_In\_Stock | Pay\_Method |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SUPPLIER** | S\_ID | S\_Name | Phone\_NO | Email | CNIC | P\_Title |

**8. Select statement for at least five common reports to be generated by the system.**

**1)**

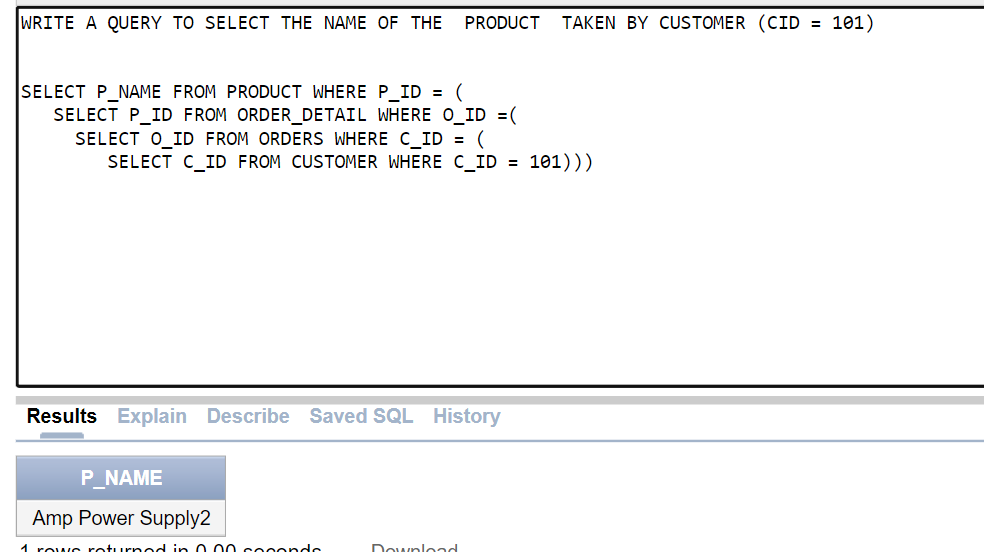
WRITE A QUERY TO SELECT THE NAME OF THE PRODUCT TAKEN BY CUSTOMER (CID = 101)

SELECT P\_NAME FROM PRODUCT WHERE P\_ID = (

SELECT P\_ID FROM ORDER\_DETAIL WHERE O\_ID =(

SELECT O\_ID FROM ORDERS WHERE C\_ID = (

SELECT C\_ID FROM CUSTOMER WHERE C\_ID = 101)))



**2)WRITE A QUERY TO DISPLAY THE NAME OF THAT EMPLOYEE AND INCREASE HIS SALARAY BY 20% IF HE HAS MANGED MORE THAN 2 CUSTOMERS**

SELECT \* FROM EMPLOYEE

SELECT \* FROM CUSTOMER

SELECT \* FROM ORDERS

SELECT \* FROM ORDER\_DETAIL

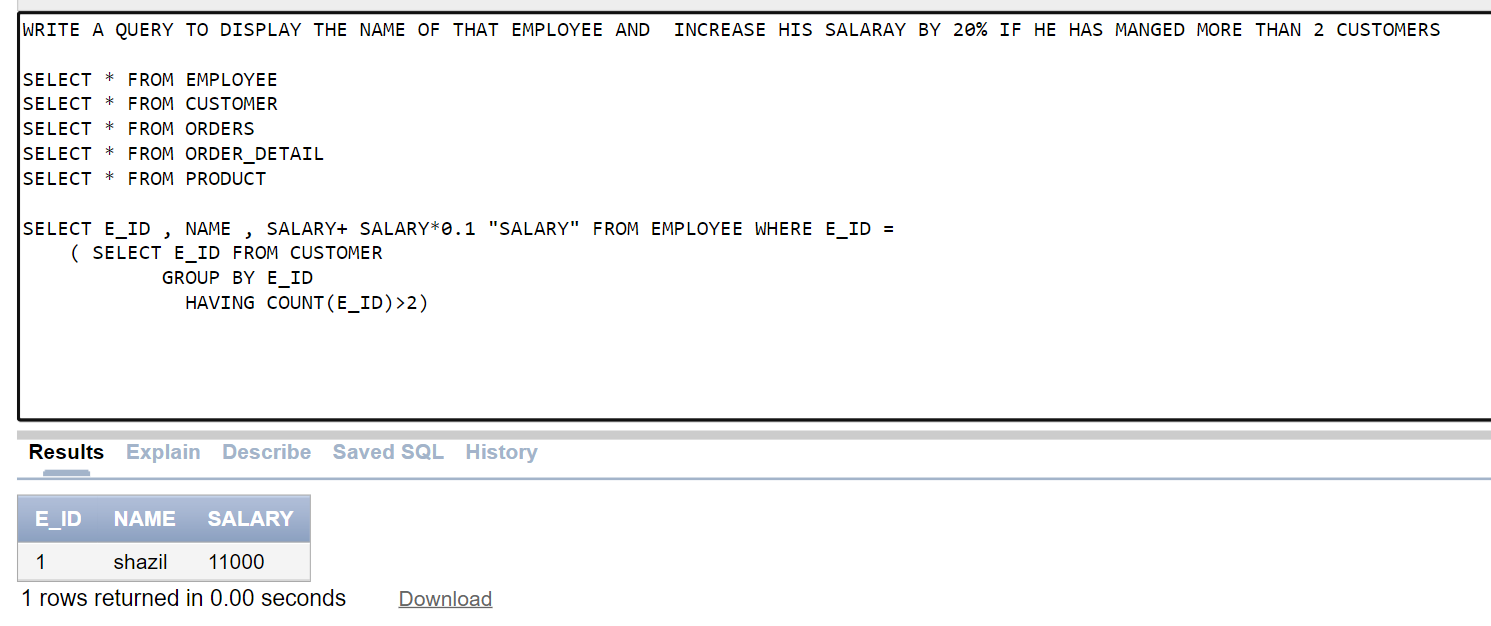
SELECT \* FROM PRODUCT

SELECT E\_ID , NAME , SALARY+ SALARY\*0.1 "SALARY" FROM EMPLOYEE WHERE E\_ID =

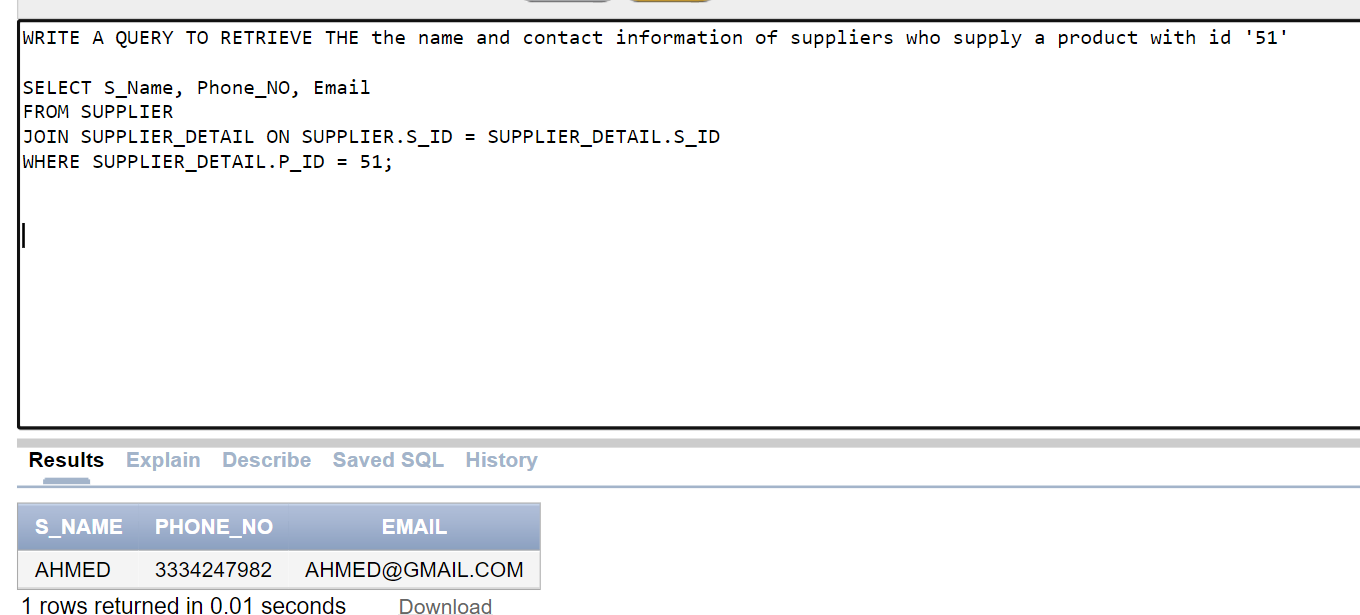
( SELECT E\_ID FROM CUSTOMER

GROUP BY E\_ID

HAVING COUNT(E\_ID)>2)



**3)WRITE A QUERY TO RETRIEVE THE the name and contact information of suppliers who supply a product with id '51'**



**4)WRITE A QUERY To retrieve the name and total amount of payments made for each order:**

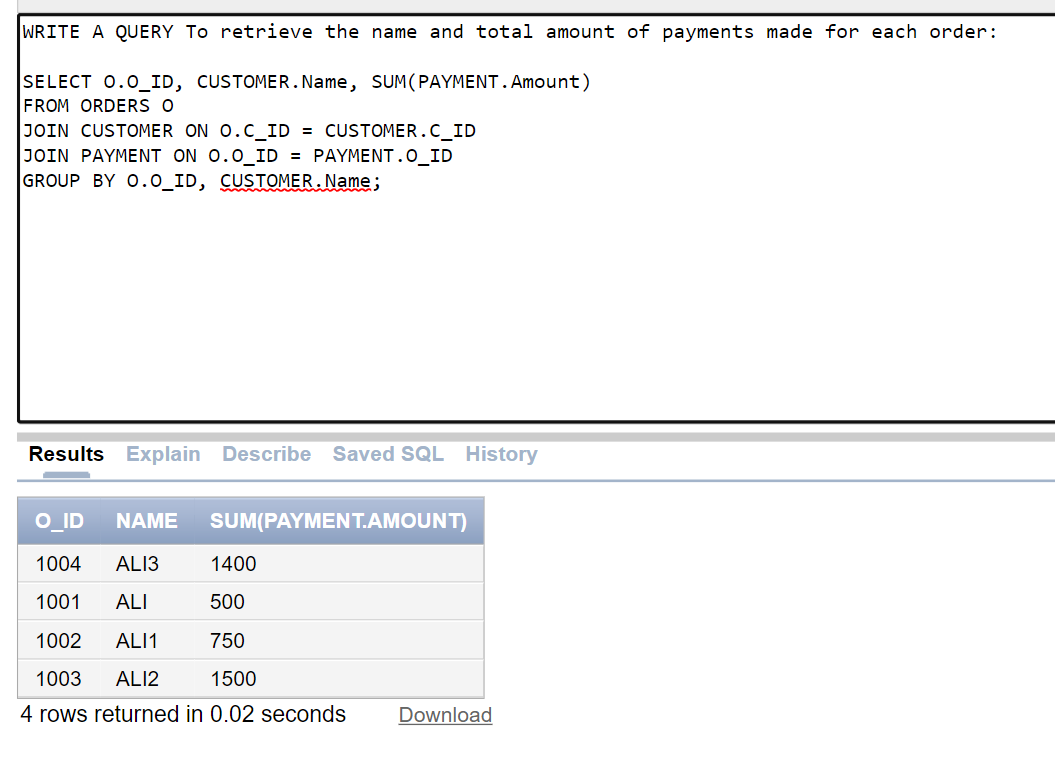
SELECT O.O\_ID, CUSTOMER.Name, SUM(PAYMENT.Amount)

FROM ORDERS O

JOIN CUSTOMER ON O.C\_ID = CUSTOMER.C\_ID

JOIN PAYMENT ON O.O\_ID = PAYMENT.O\_ID

GROUP BY O.O\_ID, CUSTOMER.Name;



**5)WRITE A QUERY To retrieve the details of an order with id 1004**

SELECT \*

FROM ORDERS

JOIN ORDER\_DETAIL ON ORDERS.O\_ID = ORDER\_DETAIL.O\_ID

JOIN PRODUCT ON ORDER\_DETAIL.P\_ID = PRODUCT.P\_ID

WHERE ORDERS.O\_ID = 1004;

