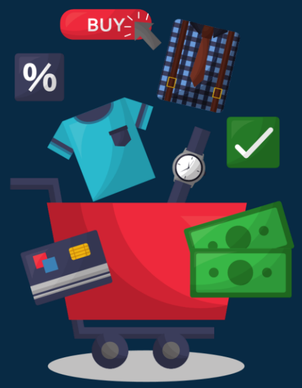
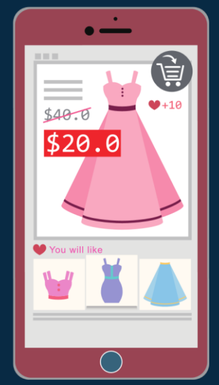
DATABASE MANAGEMENT SYSTEM PROJECT

By: Amit Saini

ONLINE SHOP



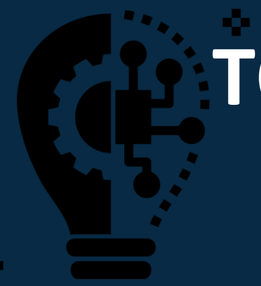


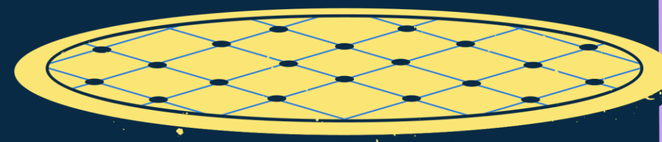
MANAGEMENT SYSTEM

INTRODUCTION

THIS PROJECT IS A WEB-BASED SHOPPING SYSTEM FOR AN EXISTING SHOP. ONLINE SHOPPING IS THE PROCESS WHEREBY CONSUMERS DIRECTLY BUY GOODS OR SERVICES FROM A SELLER IN REAL-TIME, SEE THE

PRODUCTS AVAILAIBLE AND MAKE THE PAYMENT WITHOUT AN INTERMEDIARY SERVICE, OVER THE INTERNET. IT IS A FORM OF ELECTRONIC COMMERCE. THIS PROJECT IS AN ATTEMPT TO PROVIDE THE ADVANTAGES OF ONLINE SHOPPING TO CUSTOMERS OF A REAL SHOP.





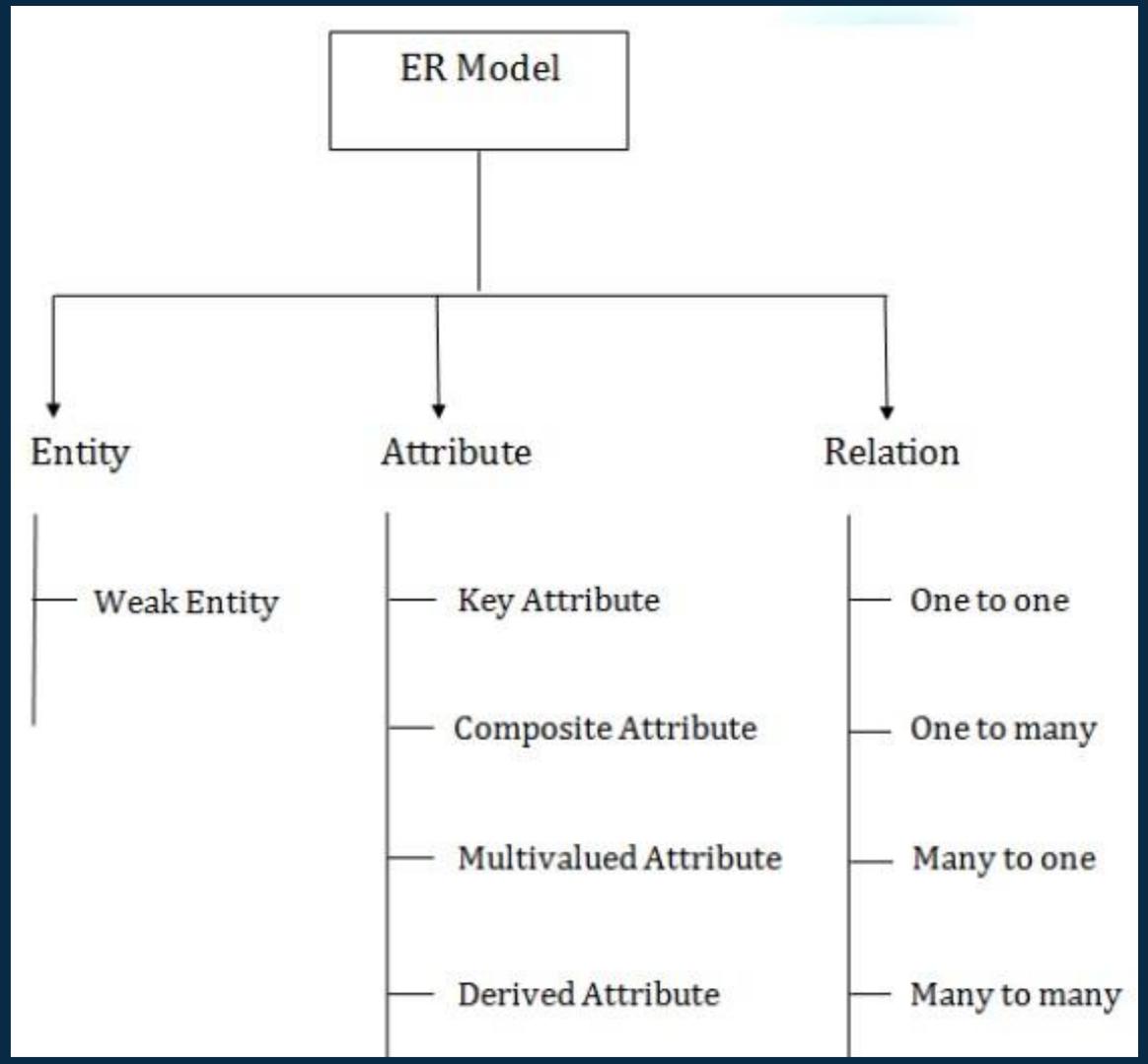
Objective of Project

The purpose of the Shopping Management System is to act as an interface to manipulate the database records of various customers and suppliers related information such as product details, product availability, order details, shipment details and various other tasks performed by them and store them as any new record that has relation to the shop in any way.

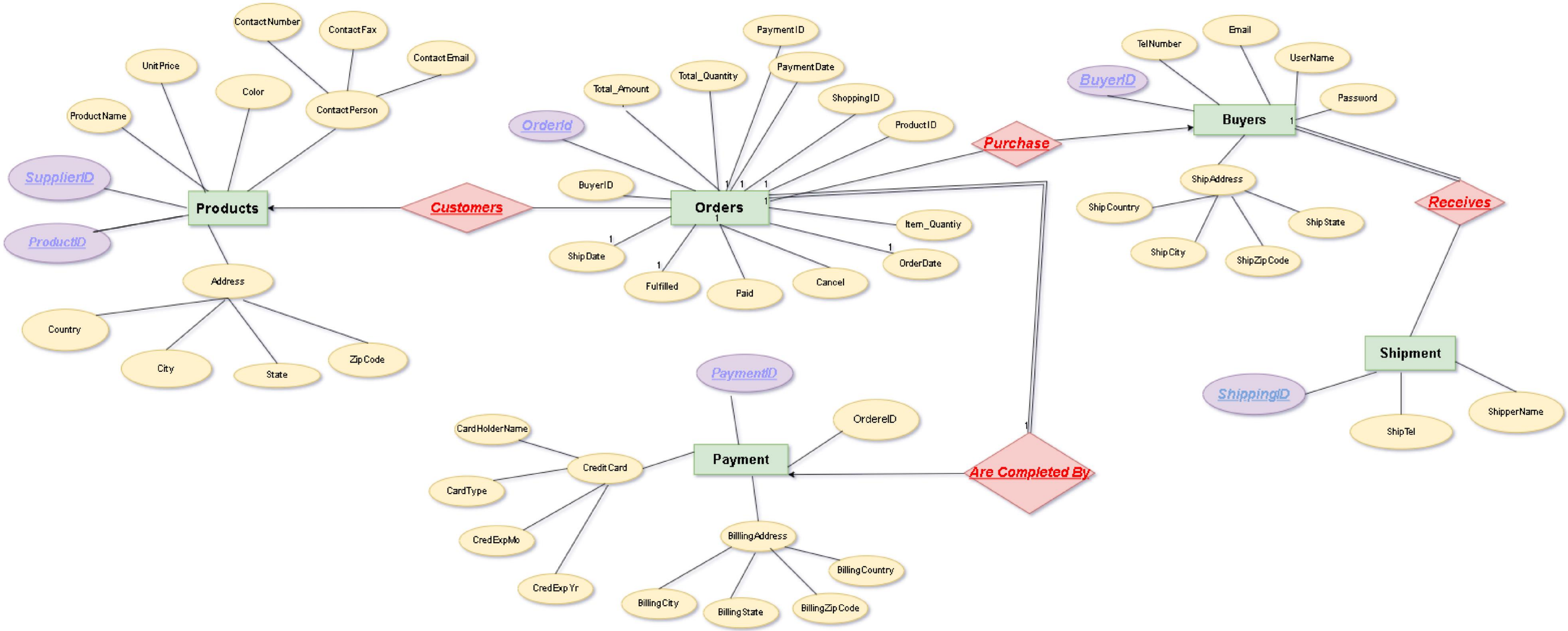
Our goal is to
create a database and query system which can handle manipulation and retrieval of data as per the requirement of the user..

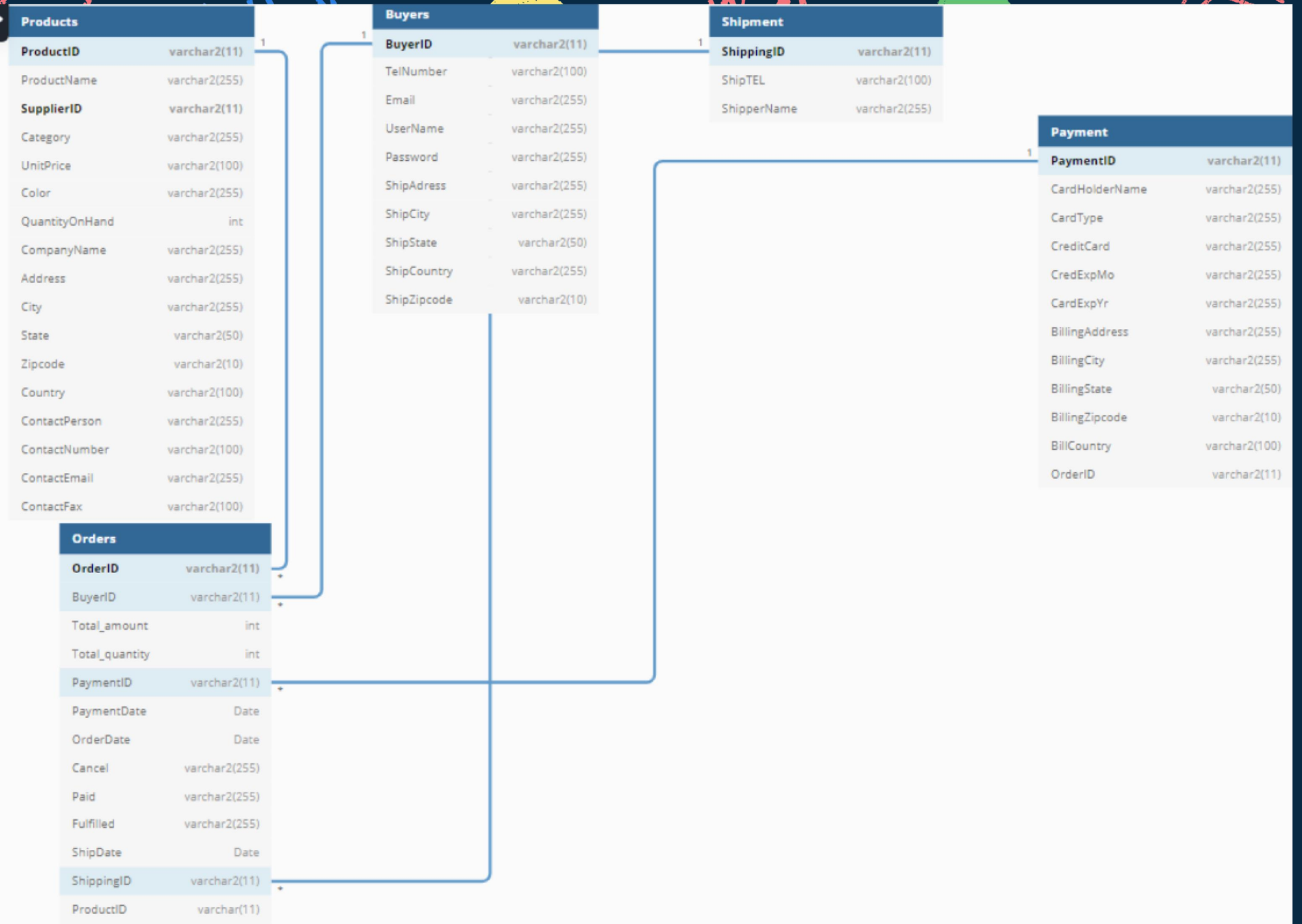
COMPONENTS OF ER DIAGRAM

ER DIAGRAM

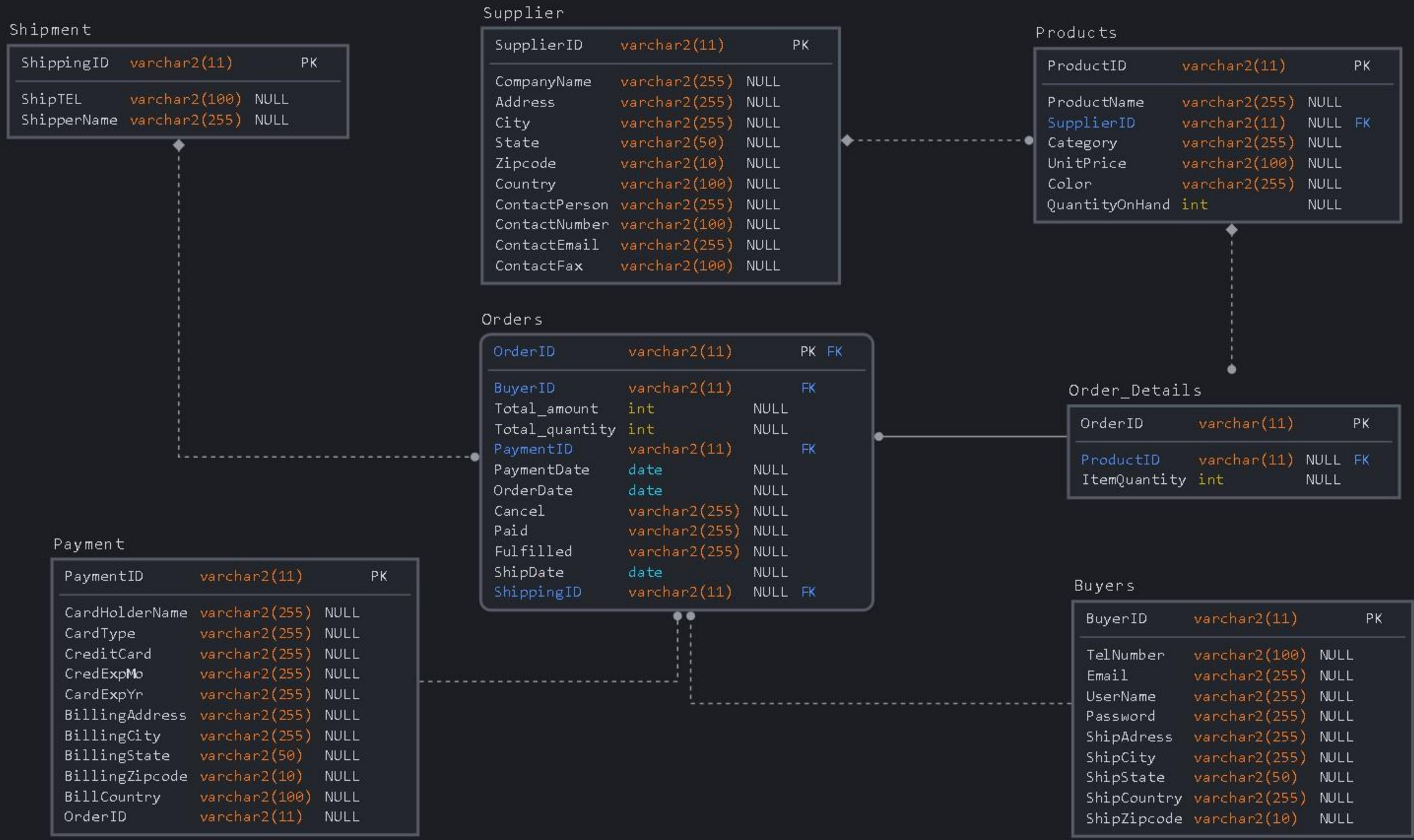


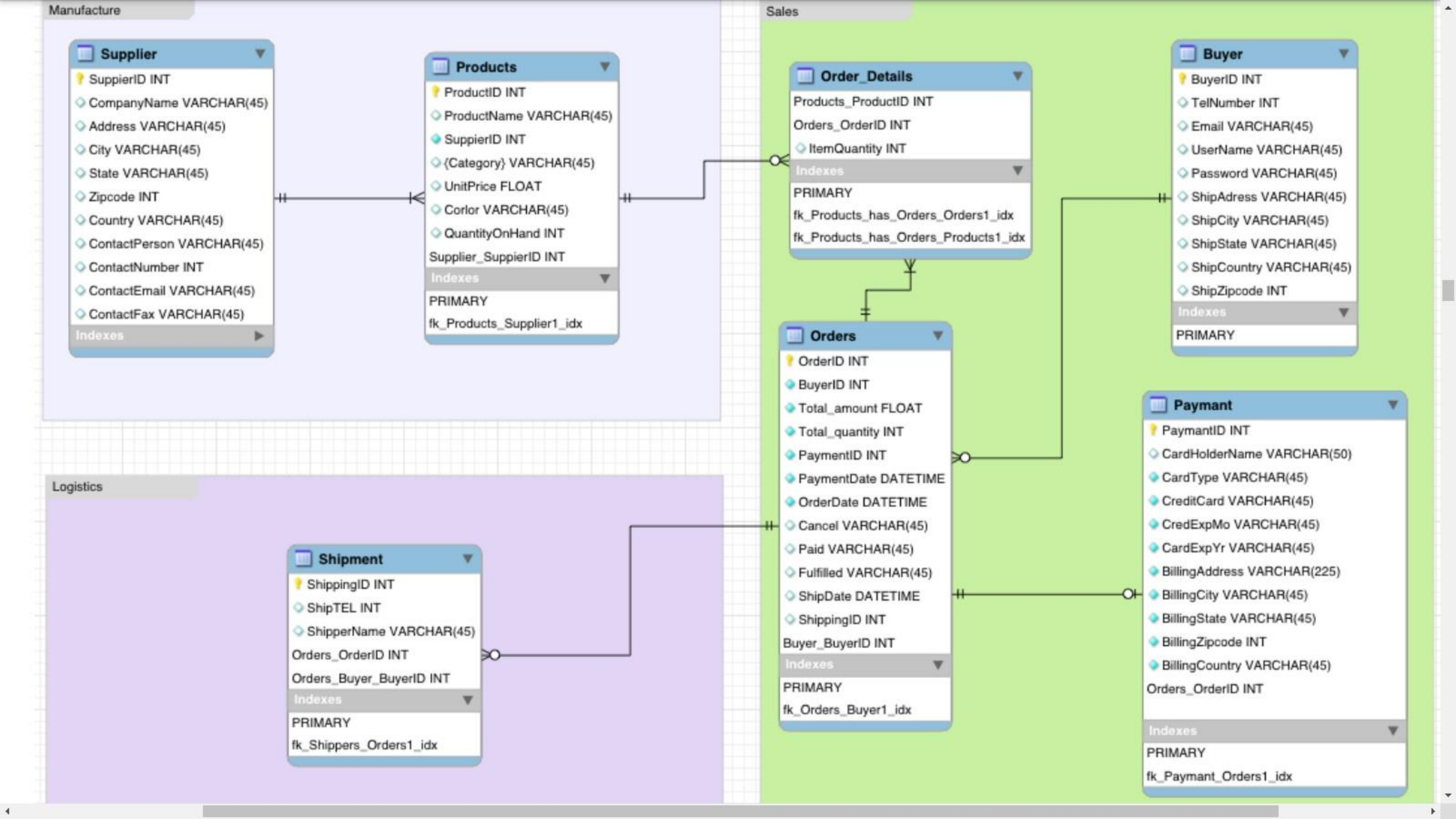
AN ER DIAGRAM SHOWS THE RELATIONSHIP AMONG ENTITY SETS. AN ENTITY SET IS A GROUP OF SIMILAR ENTITIES AND THESE ENTITIES CAN HAVE ATTRIBUTES. IN TERMS OF DBMS, AN ENTITY IS A TABLE OR ATTRIBUTE OF A TABLE IN DATABASE, SO BY SHOWING RELATIONSHIP AMONG TABLES AND THEIR ATTRIBUTES, ER DIAGRAM SHOWS THE COMPLETE LOGICAL STRUCTURE OF A DATABASE.


Products
SupplierID
ProductID
ProductName
UnitPrice
Color
ContactNumber
ContactFax
ContactEmail
ContactPerson
Address
Country
City
State
ZipCode
Customers
Orders
OrderId
BuyerID
Total_Amount
Total_Quantity
PaymentID
PaymentDate
ShoppingID
ProductID
ShipDate
Fulfilled
Paid
Cancel
Item_Quantiy
OrderDate
Purchase
Buyers
BuyerID
TelNumber
Email
UserName
Password
ShipAddress
ShipCountry
ShipCity
ShipZipCode
ShipState
Receives
Shipment
ShippingID
ShipTel
ShipperName
Payment
PaymentID
CardHolderName
CreditCard
CardType
CredExpMo
CredExpYr
OrdereID
BillingAddress
BillingCity
BillingState
BillingZipCode
BillingCountry
Are Completed By


Products
ProductID varchar2(11)
ProductName varchar2(255)
SupplierID varchar2(11)
Category varchar2(255)
UnitPrice varchar2(100)
Color varchar2(255)
QuantityOnHand int
CompanyName varchar2(255)
Address varchar2(255)
City varchar2(255)
State varchar2(50)
Zipcode varchar2(10)
Country varchar2(100)
ContactPerson varchar2(255)
ContactNumber varchar2(100)
ContactEmail varchar2(255)
ContactFax varchar2(100)
Buyers
BuyerID varchar2(11)
TelNumber varchar2(100)
Email varchar2(255)
UserName varchar2(255)
Password varchar2(255)
ShipAdress varchar2(255)
ShipCity varchar2(255)
ShipState varchar2(50)
ShipCountry varchar2(255)
ShipZipcode varchar2(10)
Shipment
ShippingID varchar2(11)
ShipTEL varchar2(100)
ShipperName varchar2(255)
Payment
PaymentID varchar2(11)
CardHolderName varchar2(255)
CardType varchar2(255)
CreditCard varchar2(255)
CredExpMo varchar2(255)
CardExpYr varchar2(255)
BillingAddress varchar2(255)
BillingCity varchar2(255)
BillingState varchar2(50)
BillingZipcode varchar2(10)
BillCountry varchar2(100)
OrderID varchar2(11)
Orders
OrderID varchar2(11)
BuyerID varchar2(11)
Total_amount int
Total_quantity int
PaymentID varchar2(11)
PaymentDate Date
OrderDate Date
Cancel varchar2(255)
Paid varchar2(255)
Fulfilled varchar2(255)
ShipDate Date
ShippingID varchar2(11)
ProductID varchar(11)
1
*

AFTER NORMALISATION


Shipment
ShippingID varchar2(11) PK
ShipTEL varchar2(100) NULL
ShipperName varchar2(255) NULL
Supplier
SupplierID varchar2(11) PK
CompanyName varchar2(255) NULL
Address varchar2(255) NULL
City varchar2(255) NULL
State varchar2(50) NULL
Zipcode varchar2(10) NULL
Country varchar2(100) NULL
ContactPerson varchar2(255) NULL
ContactNumber varchar2(100) NULL
ContactEmail varchar2(255) NULL
ContactFax varchar2(100) NULL
Products
ProductID varchar2(11) PK
ProductName varchar2(255) NULL
SupplierID varchar2(11) NULL FK
Category varchar2(255) NULL
UnitPrice varchar2(100) NULL
Color varchar2(255) NULL
QuantityOnHand int NULL
Orders
OrderID varchar2(11) PK FK
BuyerID varchar2(11) FK
Total_amount int NULL
Total_quantity int NULL
PaymentID varchar2(11) FK
PaymentDate date NULL
OrderDate date NULL
Cancel varchar2(255) NULL
Paid varchar2(255) NULL
Fulfilled varchar2(255) NULL
ShipDate date NULL
ShippingID varchar2(11) NULL FK
Order_Details
OrderID varchar(11) PK
ProductID varchar(11) NULL FK
ItemQuantity int NULL
Payment
PaymentID varchar2(11) PK
CardHolderName varchar2(255) NULL
CardType varchar2(255) NULL
CreditCard varchar2(255) NULL
CredExpMo varchar2(255) NULL
CardExpYr varchar2(255) NULL
BillingAddress varchar2(255) NULL
BillingCity varchar2(255) NULL
BillingState varchar2(50) NULL
BillingZipcode varchar2(10) NULL
BillCountry varchar2(100) NULL
OrderID varchar2(11) NULL
Buyers
BuyerID varchar2(11) PK
TelNumber varchar2(100) NULL
Email varchar2(255) NULL
UserName varchar2(255) NULL
Password varchar2(255) NULL
ShipAdress varchar2(255) NULL
ShipCity varchar2(255) NULL
ShipState varchar2(50) NULL
ShipCountry varchar2(255) NULL
ShipZipcode varchar2(10) NULL


Manufacture
Sales
Logistics
Supplier
SuppierID INT
CompanyName VARCHAR(45)
Address VARCHAR(45)
City VARCHAR(45)
State VARCHAR(45)
Zipcode INT
Country VARCHAR(45)
ContactPerson VARCHAR(45)
ContactNumber INT
ContactEmail VARCHAR(45)
ContactFax VARCHAR(45)
Indexes
Products
ProductID INT
ProductName VARCHAR(45)
SuppierID INT
{Category} VARCHAR(45)
UnitPrice FLOAT
Corlor VARCHAR(45)
QuantityOnHand INT
Supplier_SuppierID INT
Indexes
PRIMARY
fk_Products_Supplier1_idx
Order_Details
Products_ProductID INT
Orders_OrderID INT
ItemQuantity INT
Indexes
PRIMARY
fk_Products_has_Orders_Orders1_idx
fk_Products_has_Orders_Products1_idx
Buyer
BuyerID INT
TelNumber INT
Email VARCHAR(45)
UserName VARCHAR(45)
Password VARCHAR(45)
ShipAdress VARCHAR(45)
ShipCity VARCHAR(45)
ShipState VARCHAR(45)
ShipCountry VARCHAR(45)
ShipZipcode INT
Indexes
PRIMARY
Orders
OrderID INT
BuyerID INT
Total_amount FLOAT
Total_quantity INT
PaymentID INT
PaymentDate DATETIME
OrderDate DATETIME
Cancel VARCHAR(45)
Paid VARCHAR(45)
Fulfilled VARCHAR(45)
ShipDate DATETIME
ShippingID INT
Buyer_BuyerID INT
Indexes
PRIMARY
fk_Orders_Buyer1_idx
Paymant
PaymantID INT
CardHolderName VARCHAR(50)
CardType VARCHAR(45)
CreditCard VARCHAR(45)
CredExpMo VARCHAR(45)
CardExpYr VARCHAR(45)
BillingAddress VARCHAR(225)
BillingCity VARCHAR(45)
BillingState VARCHAR(45)
BillingZipcode INT
BillingCountry VARCHAR(45)
Orders_OrderID INT
Indexes
PRIMARY
fk_Paymant_Orders1_idx
Shipment
ShippingID INT
ShipTEL INT
ShipperName VARCHAR(45)
Orders_OrderID INT
Orders_Buyer_BuyerID INT
Indexes
PRIMARY
fk_Shippers_Orders1_idx

TYPES OF SQL COMMANDS

DDL Command

DDL OR DATA DEFINITION LANGUAGE ACTUALLY CONSISTS OF THE SQL COMMANDS THAT CAN BE USED TO DEFINE THE DATABASE SCHEMA. IT SIMPLY DEALS WITH DESCRIPTIONS OF THE DATABASE SCHEMA AND IS USED TO CREATE AND MODIFY THE STRUCTURE OF DATABASE OBJECTS IN THE DATABASE.

CREATE

used to create the database or its objects

ALTER

used to alter the structure of the database.

RENAME

is used to rename an object existing in the database.

DDL COMMANDS

1. CREATE

```
CREATE TABLE Order_Details (
   OrderID varchar(11) NOT NULL,
  ProductID varchar(11) default NULL,
  ItemQuantity int default NULL,
   PRIMARY KEY (OrderID));
```

HERE IS THE **OUTPUT** :

Add Column | Modify Column | Rename Column | Drop Column | Rename

Copy | Drop | Truncate | Create Lookup Table | Create App

Column Name	Data Type	Nullable	Default	Primary Key
ORDERID	VARCHAR2(11)	No	-	1
PRODUCTID	VARCHAR2(11)	Yes	NULL	-

THIS IS USED TO CREATE THE DATABASE OR ITS OBJECTS (LIKE TABLE, INDEX, FUNCTION, VIEWS, STORE PROCEDURE AND TRIGGERS).

2.RENAME

```
ALTER TABLE Supplier
RENAME COLUMN Zipcode to Zipc;
```

HERE IS THE **OUTPUT** :

Column Name	Data Type	Nullable	Default	Primary Key
SUPPLIERID	VARCHAR2(11)	No	-	1
COMPANYNAME	VARCHAR2(255)	Yes	NULL	-
ADDRESS	VARCHAR2(255)	Yes	NULL	-
CITY	VARCHAR2(255)	Yes	-	-
STATE	VARCHAR2(50)	Yes	NULL	-
ZIPC	VARCHAR2(10)	Yes	NULL	-
COUNTRY	VARCHAR2(100)	Yes	NULL	-
CONTACTPERSON	VARCHAR2(255)	Yes	NULL	-
CONTACTNUMBER	VARCHAR2(100)	Yes	NULL	-
CONTACTEMAIL	VARCHAR2(255)	Yes	NULL	-

THIS IS USED TO RENAME AN OBJECT (TABLE,COLUMN) EXISTING IN THE DATABASE.

3.ALTER

```
ALTER TABLE Products
ADD FOREIGN KEY (SupplierID) REFERENCES Supplier(SupplierID);
```

4.TRUNCATE: USED TO MODIFY THE IS USED TO REMOVE ALL DATABASE BASICALLY RECORDS FROM A TABLE, INCLUDING ALL SPACES ALLOCATED FOR THE RECORDS ARE REMOVED.

5.RENAME:

IS USED TO RENAME AN OBJECT (TABLE,COLUMN) EXISTING IN THE DATABASE.

DML Command

THE SQL COMMANDS THAT DEAL WITH THE MANIPULATION OF DATA PRESENT IN THE DATABASE BELONG TO DML OR DATA MANIPULATION LANGUAGE AND THIS INCLUDES MOST OF THE SQL STATEMENTS.THE COMMAND OF DML IS NOT AUTO-COMMITTED THAT MEANS IT CAN'T PERMANENTLY SAVE ALL THE CHANGES IN THE DATABASE. THEY CAN BE ROLLED BACK.

INSERT	UPDATE	DELETE
used to insert data into a table.	used to update existing data within a database table.	used to delete records from a table.

DML COMMAND

1. INSERT

```
INSERT INTO Supplier VALUES ('30918186609','Nascetur','8496 Sed
INSERT INTO Supplier VALUES ('70268860023','Vivamusdapibus','P.O.
INSERT INTO Supplier VALUES ('31704489846','Luctus sit','747-1877
INSERT INTO Supplier VALUES ('68659281779','Mauris','6077 Id St.',
INSERT INTO Supplier VALUES ('12716365607','Sed','Ap #924-2093 Nis
INSERT INTO Supplier VALUES ('30751277561','Aliquam','Ap #559-963
INSERT INTO Supplier VALUES ('39656653836','Phasellus','396-5140 S
INSERT INTO Supplier VALUES ('39599259968','P&G','4166 Id Avenue',
INSERT INTO Supplier VALUES ('12241497023','Praesent eu dui','P.O.
INSERT INTO Supplier VALUES ('43636501698','tortor Integer','824-4
```

EDIT	SUPPLIERID	COMPANYNAME	ADDRESS	CITY	STATE	ZIPC	COUNTRY	CONTACTPER
	39656653836	Shreyas Mishra	Sector 7 B , Chandigarh	Little Rock	Arkansas	72723	United States	Galvin Keller
	39599259968	P&G	4166 Id Avenue	Athens	GA	93824	United States	Xanthus Phillip
	30918186609	Nascetur	8496 Sed St.	Annapolis	Maryland	36447	United States	Montana Griffi
	31704489846	Luctus sit	747-1877 Fusce Street	Montpelier	Vermont	45116	United States	Breanna Tran
	12716365607	Sed	Ap #924-2093 Nisi Road	South Burlington	Vermont	61177	United States	Venus Tyson
	70268860023	Vivamusdapibus	P.O. Box 185, 7096 Fusce St.	Minneapolis	MN	12392	United States	Jamal Ward

TO INSERT TABLES IN DATABASE

2. UPDATE

THIS COMMAND IS US

```
UPDATE Supplier
Set SupplierID=39599259968
WHERE State='GA';
```

OUTPUT

SUPPLIERID	COMPANYNAME	ADDRESS	CITY	STATE
39656653836	Phasellus	396-5140 Sodales Rd.	Little Rock	Arkansas
39599259968	P&G	4166 Id Avenue	Athens	GA
30918186609	Nascetur	8496 Sed St.	Annapolis	Marylan
31704489846	Luctus sit	747-1877 Fusce Street	Montpelier	Vermont

TO UPDATE OR MODIFY
THE VALUE OF A COLUMN
IN THE TABLE.

3.DELETE

IT IS USED TO REMOVE
ONE OR MORE ROWS
FROM A TABLE.

DCL Command

DCL INCLUDES COMMANDS SUCH AS GRANT AND REVOKE WHICH MAINLY DEALS WITH THE RIGHTS, PERMISSIONS AND OTHER CONTROLS OF THE DATABASE SYSTEM.

GRANT

gives user's access privileges using the database.

SYNTAX:- GRANT SELECT,UPDATE ON

REVOKE

withdraw user's access privileges to given by GRANT command

SYNTAX:- REVOKE SELECT,UPDATE

TABLE_NAME TO USER1,
USER2,…USERN;

ON TABLE_NAME FROM USER1,
USER2,….USERN;

TCL Command

TCL INCLUDES STATEMENTS THAT ARE USED TO MANAGE THE CHANGES THAT ARE MADE FROM DML STATEMENTS. IT ENHANCES THE TRANSACTIONAL NATURE OF ORACLE SQL.

COMMIT

aves any changes made to the database.

ROLLBACK

undoes any changes made to the database.

SAVEPOINT

creates a point in your transaction to which you can roll back to.

COMMIT– Commit command is used to save all the transactions to the database.

Syntax:-.

COMMIT; (After a transaction,if keyword COMMIT is written then all the transaction is saved permanently).

Example:- COMMIT;

SAVEPOINT– It is used to roll the transaction back to a certain point without rolling back the entire transaction.

Syntax:-

SAVEPOINT savepoint_name; (Whenever any savepoint is executed then transaction is saved till that point).

Example:- SAVEPOINT savepoint_name;

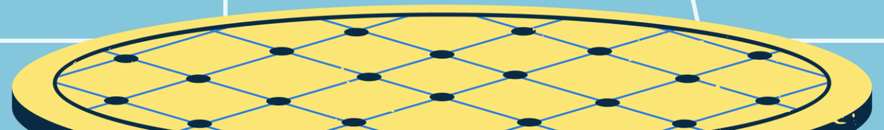
· ROLLBACK– Rollback command is used to undo transactions that have not already been saved to the database.

Syntax:- ROLLBACK; (If after a transaction, keyword rollback is executed, the database will be restored to its previous state).

Example:- ROLLBACK TO savepoint_name;

DATA CONSTRAINTS AND ITS TYPES

NAMING OF CONSTRAINT THE SQL CONSTRAINTS ARE AN INTEGRITY WHICH DEFINES SOME CONDITIONS THAT RESTRICT THE COLUMN TO REMAIN TRUE WHILE INSERTING OR UPDATING OR DELETING DATA IN THE COLUMN. CONSTRAINTS CAN BE SPECIFIED WHEN THE TABLE IS CREATED FIRST WITH A CREATE TABLE STATEMENT OR AT THE TIME OF



MODIFICATION OF THE STRUCTURE OF AN EXISTING TABLE WITH ALTER TABLE STATEMENT. WE CAN NAME THE CONSTRAINT BY OUR OWN WHILE CREATING OR ALTERING THE TABLE TO GIVE THE CONSTRAINT A UNIQUE NAME.

TYPES OF CONSTRAINTS

Column Level Constraints

Column level constraints refer to a single column in the table and do not specify a column name (except check

constraints). They refer to the column that they follow.

Table Level Constraints

Table level constraints refer to one or more columns in the table. Table level constraints specify the names of the columns to which they apply.

Table level CHECK constraints canrefer to 0 or more columns in the table.

Examples on Column and Table Level

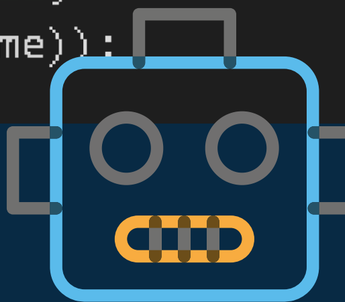
Constraints

COLUMN LEVEL

```
create table orders(name char(10) not null,
        id integer references idtable(id),
        price integer check (price > 0));
```

TABLE LEVEL

```
create table supplier(firstname char(20) not null,
                lastname char(20) not null,
                unique(firstname, lastname));
```



DIFFERENT CONSTRAINTS IN SQL

1.PRIMARY KEY

PRIMARY KEY IS A FIELD WHICH UNIQUELY IDENTIFIES EACH ROW IN THE TABLE. IF A FIELD IN A TABLE AS PRIMARY KEY, THEN THE FIELD WILL NOT BE ABLE TO CONTAIN NULL VALUES AS WELL AS ALL THE ROWS SHOULD HAVE UNIQUE VALUES FOR THIS FIELD.

EXAMPLE

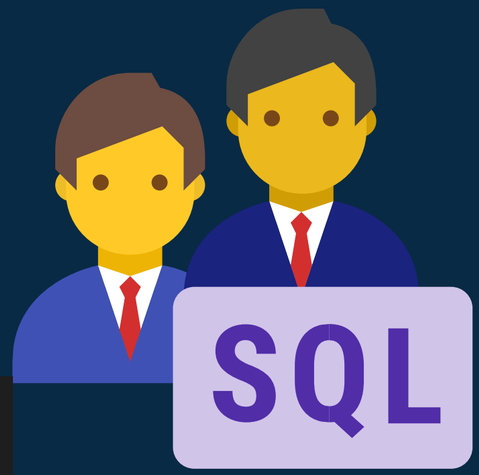
```
CREATE TABLE Shipment (
ShippingID varchar2(11)  NOT NULL,
ShipTEL varchar2(100) default NULL,
ShipperName varchar2(255),
PRIMARY KEY (ShippingID));
```

2. FOREIGN KEY

FOREIGN KEY IS A FIELD IN A TABLE WHICH UNIQUELY IDENTIFIES EACH ROW OF A ER TABLE. THAT IS, THIS FIELD POINTS TO PRIMARY KEY OF ANOTHER TABLE. THIS USUALLY A KIND OF LINK BETWEEN THE TABLES.

```
 CREATE TABLE Orders (
OrderID varchar2(11) NOT NULL,
BuyerID varchar2(11) NOT NULL,
Total_amount int default NULL,
Total_quantity int default NULL,
PaymentID varchar2(11) NOT NULL,
PaymentDate Date,
OrderDate Date,
Cancel varchar2(255) default NULL,
Paid varchar2(255) default NULL,
Fulfilled varchar2(255) default NULL,
ShipDate Date,
ShippingID varchar2(11) default NULL,
PRIMARY KEY (OrderID),
Constraint Orders_FK1 FOREIGN KEY (BuyerID) REFERENCES
Buyers(BuyerID),
Constraint Orders_FK2 FOREIGN KEY (PaymentID) REFERENCES
Payment(PaymentID),
Constraint Orders_FK3 FOREIGN KEY (ShippingID) REFERENCES
Shipment(ShippingID));
```

3.UNIQUE



THIS CONSTRAINT HELPS

```sql
CREATE TABLE suppliers (
    supplier_id INT AUTO_INCREMENT,
    name VARCHAR(255) NOT NULL,
    phone VARCHAR(15) NOT NULL UNIQUE,
    address VARCHAR(255) NOT NULL,
    PRIMARY KEY (supplier_id),
    CONSTRAINT uc_name_address UNIQUE (name , address)
);
```

TO

QUELY IDENTIFY EACH ROWIN THE TABLE.

I.E. FOR A PARTICULAR

COLUMN, ALL THE ROWS
SHOULD HAVE UNIQUE
VALUES. WE CAN HAVE
THAN ONE UNIQUE COLUMNS IN A TABLE.

4. NOT NULL

IF WE SPECIFY A FIELD IN A TABLE TO BE NOT NULL. THEN THE FIELD WILL NEVER ACCEPT NULL VALUE. THAT IS, YOU WILL BE NOT ALLOWED TO INSERT A NEW ROW IN THE TABLE WITHOUT SPECIFYING ANY VALUE TO THIS FIELD.

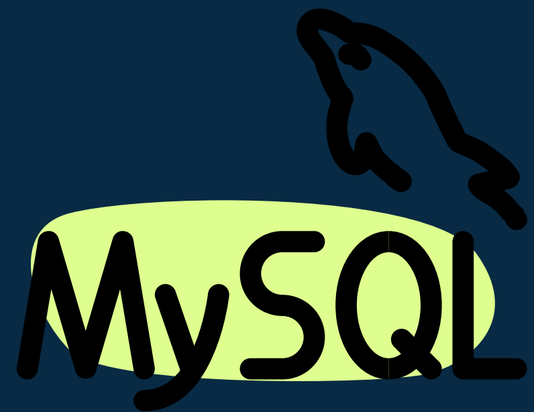
```
 CREATE TABLE Payment (
PaymentID varchar2(11) NOT NULL,
CardHolderName varchar2(255) default NULL,
CardType varchar2(255) default NULL,
CreditCard varchar2(255),
CredExpMo varchar2(255) default NULL,
CardExpYr varchar2(255) default NULL,
BillingAddress varchar2(255) default NULL,
BillingCity varchar2(255),
BillingState varchar2(50) default NULL,
BillingZipcode varchar2(10) default NULL,
BillCountry varchar2(100) default NULL,
OrderID varchar2(11) default NULL,
 PRIMARY KEY (PaymentID));
```

5. CHECK

USING THE CHECK CONSTRAINT WE CAN
A CONDITION FOR A FIELD, WHICH
BE SATISFIED AT THE TIME OF
G VALUES FOR THIS FIELD.

```sql
CREATE TABLE Order_Details (
   OrderID varchar(11) NOT NULL CHECK(OrderID>0),
  ProductID varchar(11) default NULL,
  ItemQuantity int default NULL,
   PRIMARY KEY (OrderID));
```

6. DEFAULT



THIS CONSTRAINT IS USED TO PROVIDE A DEFAULT VALUE FORTHE FIELDS. THAT IS, IF AT THE TIME OF ENTERING NEW RECORDS IN THE TABLE IF THE USER DOES NOT SPECIFY ANY VALUE FOR THESE FIELDS FAULT VALUE WILL BE ASSIGNED TO THEM.

```
CREATE TABLE Products (
  ProductID varchar2(11) NOT NULL,
  ProductName varchar2(255) default NULL,
  SupplierID varchar2(11) default NULL,
  Category varchar2(255) default NULL,
  UnitPrice varchar2(100) default NULL,
  Color varchar2(255) default NULL,
  QuantityOnHand int default NULL,
   PRIMARY KEY (ProductID));
```

BEHAVIORS OF FOREIGN KEY TABLE:-

ON DELETE / UPDATE RESTRICT -

RESTRICT MEANS THAT ANY ATTEMPT TO DELETE AND/OR UPDATE THE PARENT WILL FAIL THROWING AN ERROR. THIS IS
THE DEFAULT BEHAVIOUR IN THE EVENT THAT A REFERENTIAL
ACTION IS NOT EXPLICITLY SPECIFIED.FOLLOWING QUERY TRIES
TO DELETE A ROW FROM THE TABLE BILL, BUT THE ORDER STABLE REFERENCES THE BILL TABLE' S PRIMARY KEY, SO IT
THROWS AN ERROR.

ON DELETE / UPDATE CASCADE

ON DELETE CASCADE MEANS THAT IF THE PARENT RECORD IS DELETED, ANY CHILD RECORDS ARE ALSO DELETED. ONUPDATE CASCADE MEANS THAT IF THE PARENT PRIMARY KEY IS CHANGED, THE CHILD VALUE WILL ALSO CHANGE TO REFLECT THAT. ORACLE DOESN'T SUPPORT ON UP-DATE CASCADE.

```
CREATE TABLE TABLE_NAME(COL1 DATATYPE,..,
    COLN DATATYPE FOREIGN KEY REFERENCES
TABLE2_NAME(COLX) ON UPDATE CASCADE);
```

BEHAVIORS OF FOREIGN KEY TABLE:-

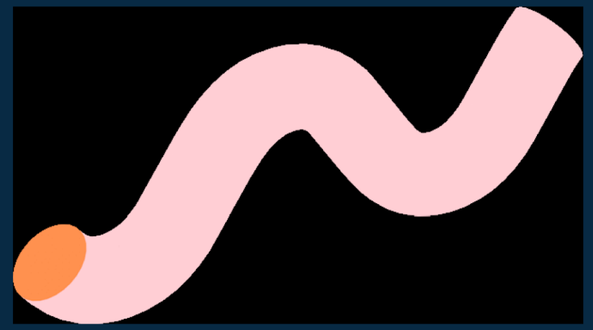
SQL OPERATIONS AND FUCTIONS

OPERATIONS

ARITHMETIC OPERATORS

LOGICAL OPERATORS

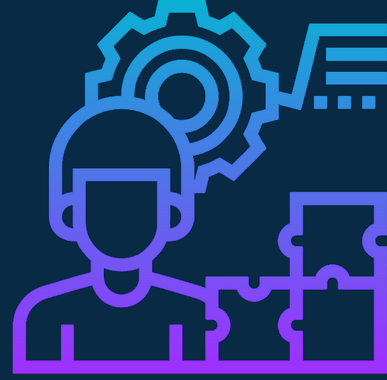
RELATIONAL OPERATORS

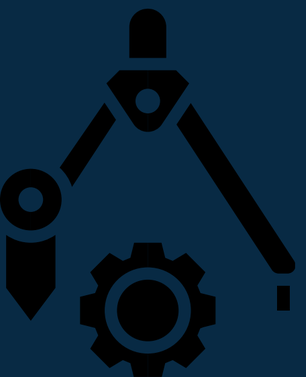


ARITHMETIC OPERATORS

S.No	Operator	Description	Sample Query	Output
1.	+	Addition	Select 6 + 2;	8
2.	-	Subtraction	Select 6 – 2;	4
3.	*	Multiply	Select 6 * 2;	12
4.	/	Division	Select 6 / 2;	3
5.	%	Modulo	Select 6 % 2;	0

LOGICAL OPERATORS



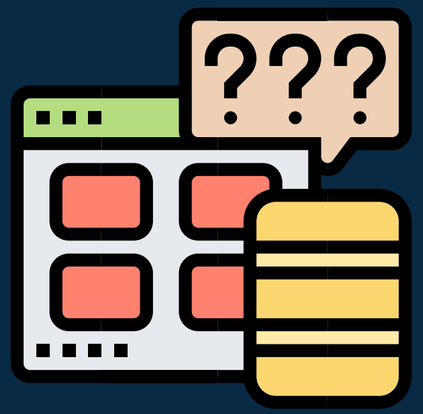


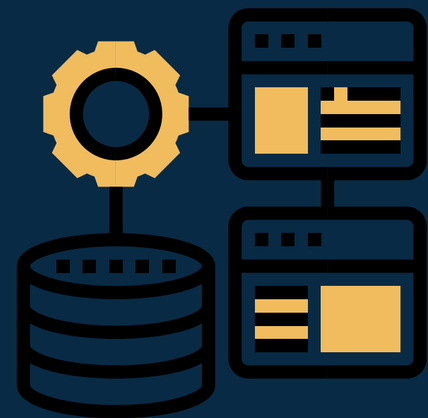
Logical Operators:

Logical operators in SQL will return either true or false value.

Operators	Function	Example
AND	Check two conditions are true	Select * from emp where basic >= 10000 AND basic <= 20000;
OR	Check any of the two conditions are true	Select * from emp where basic >= 10000 OR dept = 'Sales';
NOT	Reversed the result of logical expression	Select * from emp where NOT(basic >= 1000 OR dept = 'Sales');

Operator	Description	Example
=	Equal to	(x=y) is not true
!=	Equal or not	(x!=y) is true
< >	Not equal to	(x<>y) is true
>	Greater than	(x>y) is not true
<	Less than	(x<="" td="">
>=	Greater than or equal to	(x>=y) is not true
<=	Less than or equal to	(x<=y) is true
!<	Not less than	(x!<="" td="">
!>	Not greater than	(x!>y) is true





RELATIONAL OPERATORS

1>

```
SELECT * FROM orders WHERE TOTAL_AMOUNT > ANY (SELECT TOTAL_AMOUNT FROM orders WHERE TOTAL_AMOUNT>=7);
```

HERE IS THE **OUTPUT** :

ORDERID	BUYERID	TOTAL_AMOUNT	TOTAL_QUANTITY
35764031654	94908631679	928	2
47217024154	26350935579	662	5
70701609058	89264121725	238	13
07261862587	12714972662	177	6
39878325779	72330070747	134	11
99251300121	81921795835	68	8
96945305380	42711312958	56	4
90817183713	67711139299	54	9
21942566549	50345881058	48	1

2>

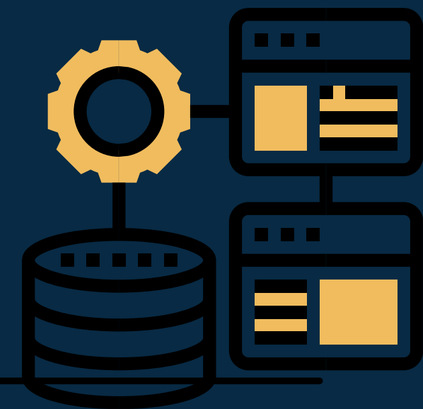
```
SELECT * FROM orders WHERE TOTAL_QUANTITY BETWEEN 5 AND 20;
```

HERE IS THE **OUTPUT** :

Results | Explain | Describe | Saved SQL | History

ORDERID	BUYERID	TOTAL_AMOUNT	TOTAL_QUANTITY
07261862587	12714972662	177	6
89878325779	72330070747	134	11
70701609058	89264121725	238	13
05553373345	75521050479	22	7
99251300121	81921795835	68	8
90817183713	67711139299	54	9
47217024154	26350935579	662	5

7 rows returned in 0.02 seconds Download

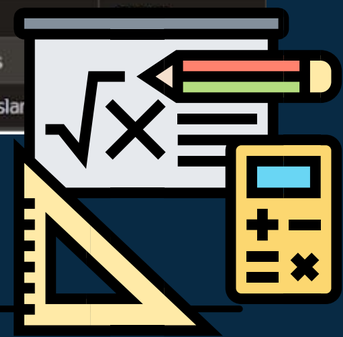


3>

```
select * from buyers
```

HERE IS THE **OUTPUT** :

BUYERID	TELNUMBER	EMAIL	USERNAME	PASSWORD	SHIPADRESS	SHIPCITY	SHIPSTATE	SHIPCOUNTRY	SHIPZIPCODE
94908631679	1-772-737-2701	molestie@idantedictum.ca	Clark	JFA79CQJ8XU	P.O. Box 504, 7630 Lacus Rd.	Viransehir	Sanliurfa	Liberia	65242
89264121725	1-905-188-8108	mi.pede@non.edu	Noble	AOF35ISM0QN	2510 Tellus Avenue	Joliet	IL	Christmas Island	86876
50345881058	1-850-899-9543	euismod.Etiam@etultrices.edu	Tashya	PDE87LWL3PY	8200 Quis, Street	Vezirköprü	Samsun	Guinea-Bissau	M5Y 1Z0
81921795835	1-583-615-6760	velit.dui@sapien.org	Aretha	ANP81YWC9CU	Ap #516-795 Nisi Road	Mildura	VIC	Singapore	4505
26350935579	1-865-217-7844	ac.mattis@felispurus.org	Abbot	VSR52BPA7OY	951-727 A Street	Laramie	WY	Morocco	007708
12714972662	1-102-293-5153	Quisque@elitdictumeu.net	Vance	RST79SIK9CB	1341 In St.	Jerez de la Frontera	AN	Singapore	53506
75521050479	1-959-804-3019	id.libero.Donec@gmail.com	Matthew	PWN64YUG3AJ	253-4847 Rutrum Ave	Callander	PE	Mongolia	ZN53 8TG
72330070747	1-184-195-5645	gravida.sagittis.Duis@magnaa.ca	Dominic	OFX66VPY2TS	Ap #976-802 Dignissim Street	Islahiye	Gaz	Finland	
42711312958	1-317-594-7754	Nunc.ac@molestieSedid.ca	Lynn	JEE58NSU1DO	7377 Cras Rd.	Gotzis	Vbg	Seychelles	
67711139299	1-632-629-5645	gravida.non@urnasuscipitnonummy.net	Dustin	BSW81VNC4BY	Ap #972-7019 Nulla Street	Orangeville	ON	Marshall Islar	



4> LIKE STATEMENTS

```sql
Select Distinct(ProductName) from Products
where Products.ProductName Like 'S%';
```

HERE IS THE **OUTPUT** :

Results	Explain	Describe	Saved SQL	History
Shampoo				
Sets				

2 rows returned in 0.01 seconds Download

```sql
SELECT BuyerID,Email,UserName,ShipCountry
FROM Buyers
WHERE ShipCountry IN ('Singapore', 'Morocco');
```

5> IN OPERATION

HERE IS THE OUTPUT :

Results | Explain | Describe | Saved SQL | History

BUYERID	EMAIL	USERNAME	SHIPCOUNTRY
81921795835	velit.dui@sapien.org	Aretha	Singapore
12714972662	Quisque@elitdictumeu.net	Vance	Singapore
26350935579	ac.mattis@felispurus.org	Abbot	Morocco

3 rows returned in 0.02 seconds Download

JOIN OPERATIONS

A SQL JOIN STATEMENT IS USED TO COMBINE DATA OR ROWS FROM TWO OR MORE TABLES BASED ON A COMMON FIELD BETWEEN THEM.

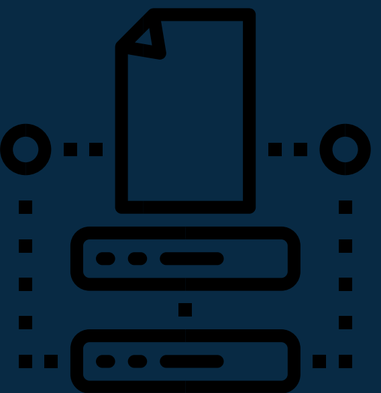
TYPES OF JOINS

CROSS JOIN

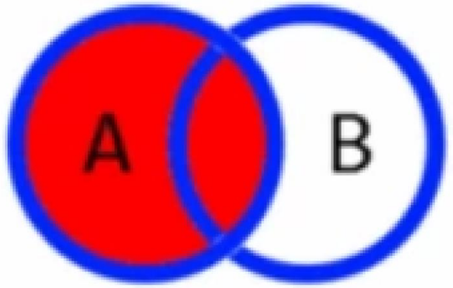
NATURAL JOIN

INNER JOIN

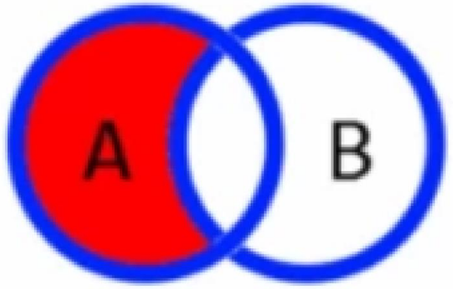
OUTER JOIN



LEFT OUTER JOIN

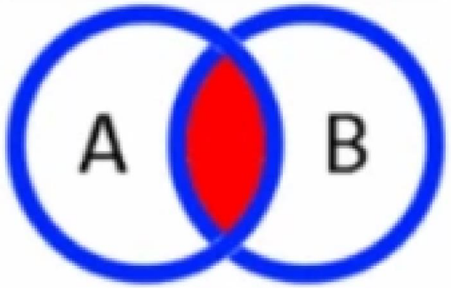



```
SELECT *
FROM TableA a
LEFT JOIN TableB b
    ON a.KEY = b.KEY
```



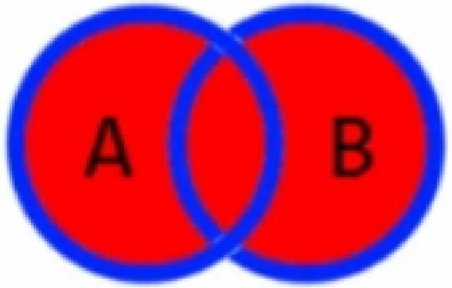

```
SELECT *
FROM TableA a
LEFT JOIN TableB b
    ON a.KEY = b.KEY
WHERE b.KEY IS NULL
```

INNER JOIN

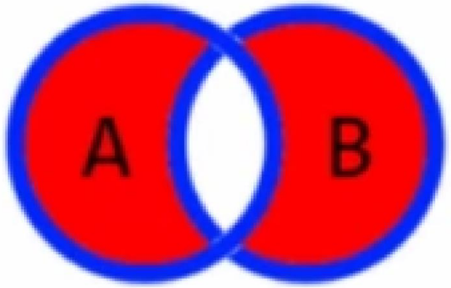



```
SELECT *
FROM TableA a
INNER JOIN TableB b
    ON a.KEY = b.KEY
```

FULL OUTER JOIN

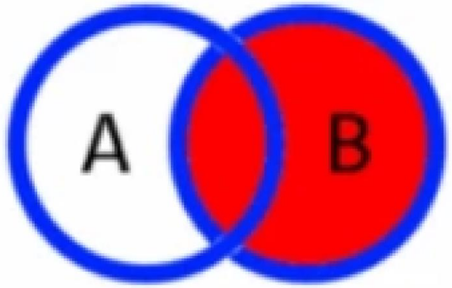



```
SELECT *
FROM TableA a
FULL OUTER JOIN TableB b
    ON a.KEY = b.KEY
```

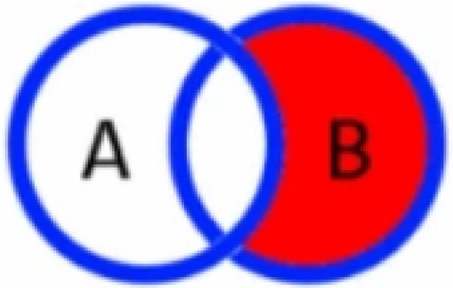



```
SELECT *
FROM TableA a
FULL OUTER JOIN TableB b
    ON a.KEY = b.KEY
WHERE a.KEY IS NULL
    OR b.KEY IS NULL
```

RIGHT OUTER JOIN




```
SELECT *
FROM TableA a
RIGHT JOIN TableB b
    ON a.KEY = b.KEY
```




```
SELECT *
FROM TableA a
RIGHT JOIN TableB b
    ON a.KEY = b.KEY
WHERE a.KEY IS NULL
```

CROSS JOIN

CROSS JOIN IS USED TO COMBINE EACH ROW OF THE FIRST TABLE WITH EACH
ROW OF THE SECOND TABLE. IT IS ALSO KNOWN AS THE CARTESIAN JOIN SINCE IT RETURNS THE CARTESIAN PRODUCT OF THE SETS OF ROWS FROM THE JOINED TABLES.

OUTPUT ON NEXT PAGE

```sql
SELECT *
FROM Products
CROSS JOIN Orders
WHERE Products.ProductName = 'Lotion' OR Products.ProductName = 'Primer';
```

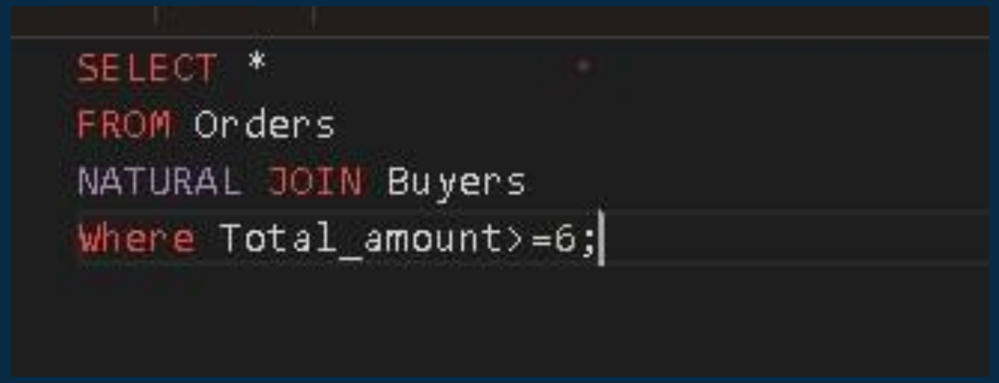
HERE IS THE **OUTPUT** :

PRODUCTID	PRODUCTNAME	SUPPLIERID	CATEGORY	UNITPRICE	COLOR	QUANTITYONHAND
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794
197710-3876	Lotion	70268860023	Eye, Face	$26.98	green	794

NATURAL JOIN

NATURAL JOIN JOINS TWO TABLES BASED ON SAME ATTRIBUTE NAME AND DATA TYPES. THE RESULTING TABLE WILL CONTAIN ALL THE ATTRIBUTES OF BOTH THE TABLE BUT KEEP ONLY ONE COPY OF EACH COMMON COLUMN.

EXAMPLE



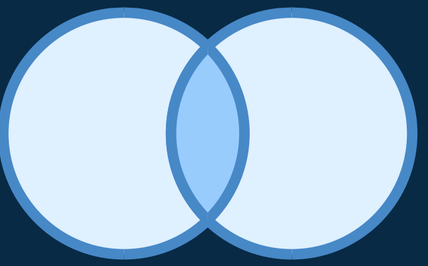
```
SELECT *
FROM Orders
NATURAL JOIN Buyers
Where Total_amount>=6;
```

OUTPUT ON NEXT PAGE

HERE IS THE **OUTPUT** :

BUYERID	ORDERID	TOTAL_AMOUNT	TOTAL_QUANTITY	PAYMENTID	PAYMENTDATE
94908631679	85764031654	928	2	31863280913	11/25/2021
89264121725	70701609058	238	13	38387495295	12/15/2021
81921795835	99251300121	68	8	92384433306	11/17/2021
67711139299	90817183713	54	9	49871562602	11/17/2021
50345881058	21942566549	48	1	57773141099	10/12/2021
12714972662	07261862587	177	6	26660945790	10/20/2001

INNER JOIN



INNER JOIN JOINS TWO TABLE ON THE BASIS OF THE COLUMN WHICH IS EXPLICITLY SPECIFIED IN THE ON CLAUSE. THE RESULTING TABLE WILL CONTAIN ALL THE ATTRIBUTES FROM BOTH THE TABLES INCLUDING COMMON COLUMN ALSO.

```sql
select Buyers.BuyerID,Orders.ShipDate from
Buyers inner join Orders on
Orders.BuyerID = Buyers.BuyerID
```

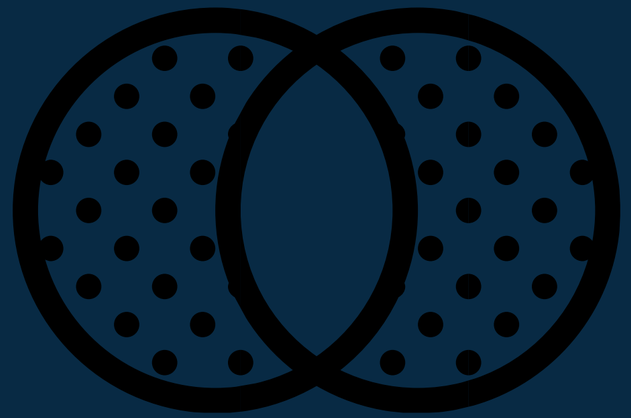
OUTPUT ON NEXT PAGE

HERE IS THE **OUTPUT** :

Results | Explain | Describe | Saved SQL | History

BUYERID	SHIPDATE
12714972662	10/27/2021
50345881058	10/15/2021
42711312958	10/31/2021
67711139299	11/25/2021
81921795835	11/22/2021
72330070747	11/16/2021
94908631679	11/28/2021
89264121725	12/20/2021
75521050479	01/05/2021
26350935579	11/28/2021

LEFT JOIN



INNER JOIN JOINS TWO TABLE ON THE BASIS OF THE COLUMN WHICH IS EXPLICITLY SPECIFIED IN THE ON CLAUSE. THE RESULTING TABLE WILL CONTAIN ALL THE ATTRIBUTES FROM BOTH THE TABLES INCLUDING COMMON COLUMN ALSO.

OUTPUT ON NEXT PAGE

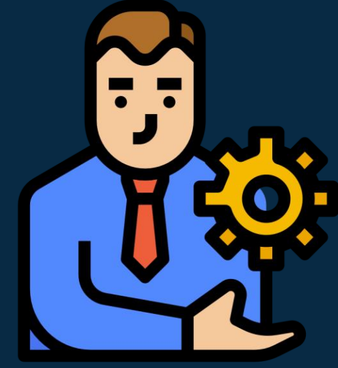
```
select ShipCountry,count(*) as bestsell from Buyers left
join Orders on Buyers.BuyerID = Orders.BuyerID group by ShipCountry;
```

HERE IS THE **OUTPUT** :

Results | Explain | Describe | Saved SQL | History

SHIPCOUNTRY	BESTSELL
Finland	1
Liberia	1
Morocco	1
Singapore	2
Marshall Islands	1
Christmas Island	1
Guinea-Bissau	1
Seychelles	1
Mongolia	1

9 rows returned in 0.04 seconds Download



FUNCTIONS

1>. .STRING FUNCTIONS

Functions	Description	Syntax
CONCAT	Adds two or more Strings together.	SELECT CONCAT(string1, string2, ..., string_n)
LEN	Returns the length of	SELECT LEN(string)
REVERSE	Reverses a string and returns the result.	SELECT REVERSE(string);
SUBSTRING	Extracts some characters from a string.	SELECT SUBSTRING(string, start, length);

LTRIM	Remove left white spaces of the string.	SELECT LTRIM(string)
RTRIM	Remove right white spaces of the string.	SELECT RTRIM(string)
TRIM	Remove both left and right white spaces from the string.	SELECT TRIM([characters FROM]string)
UPPER	Changes all letters of string to upper case.	SELECT UPPER(text)
LOWER	Changes all letters of string to lower case.	SELECT LOWER(text)
REPLACE	Remove all occurrences of a substring within a string, with a new substring.	SELECT REPLACE(string, old_string, new_string)

EXAMPLES 1>

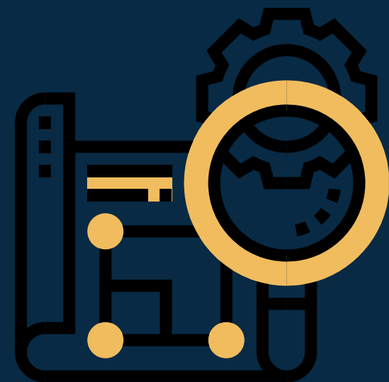
query:

```
/////string function
SELECT ProductName, LENGTH(ProductName) AS LENGTHOFNAME FROM Products;
```

HERE IS THE OUTPUT :

Output

PRODUCTNAME	LENGTHOFNAME
Lotion	6
Remover	7
Beauty	6
Beauty	6
Sets	4
Lotion	6
Shampoo	7
Moisturizer	11
Sets	4
Primer	6



EXAMPLES 2>

```
SELECT UPPER(USERNAME) AS UpperFirstName FROM buyers;
```

HERE IS THE OUTPUT :

	UPPERFIRSTNAME
CLARK	
NOBLE	
TASHYA	
ARETHA	
ABBOT	
VANCE	
MATTHEW	
DOMINIC	
LYNN	

EXAMPLES 3>

Query:

```
SELECT LOWER(USERNAME) AS LowerLastName From buyers;
```

Output:

	LOWERLASTNAME
clark	
noble	
tashya	
aretha	
abbot	
vance	
matthew	
dominic	
lynn	
dustin	

Numeric Functions

Functions	Description	Syntax
ABS()	It returns the absolute value of a number.	SELECT ABS(num);
ACOS()	It returns the arc cosine of a number.	SELECT ACOS(num);
ASIN()	It returns the arc sine of a number.	SELECT ASIN(num);
SQRT()	It returns the square root of a number	SELECT SQRT(num);
ROUND()	It returns a number rounded to a certain number of decimal places.	SELECT ROUND(num);
TRUNCATE()	This doesn't work for SQL Server. It returns 7.53635 truncated to 2 places right of the decimal point.	SELECT TRUNCATE(num,trunc_pl aces);

ATAN()	It returns the arc tangent of a number.	SELECT ATAN(num);
CEIL()/CEILING()	It returns the smallest integer value that is greater than or equal to a number.	SELECT CEIL(num);
COS()	It returns the cosine of the integer.	SELECT COS(num);
SIN()	It returns the sine of the integer.	SELECT SIN(num);
TAN()	It returns the tangent of the integer.	SELECT TAN(num);
FLOOR()	It returns the largest integer value that is less than or equal to a number.	SELECT FLOOR(num);
GREATEST()	It returns the greatest value in a list of expressions.	SELECT GREATEST(list_of_numb ers);
LEAST()	It returns the smallest value in a list of expressions	SELECT LEAST(list_of_numbers);

EXAMPLES

Query:

```
select avg(Total_amount) from orders;
```

HERE IS THE **OUTPUT** :

Output:

```
238.7
```

AGGREGATE FUNCTIONS

AGGREGATE FUNCTIONS

SQL AGGREGATE FUNCTIONS RETURN A SINGLE VALUE, CALCULATED FROM VALUES IN A COLUMN.USEFUL AGGREGATE FUNCTIONS:

AVG() - RETURNS THE AVERAGE VALUE

COUNT() - RETURNS THE NUMBER OF ROWS

FIRST() - RETURNS THE FIRST VALUE

LAST() - RETURNS THE LAST VALUE

MAX() - RETURNS THE LARGEST VALUE

MIN() - RETURNS THE SMALLEST VALUE

SUM() - RETURNS THE SUM

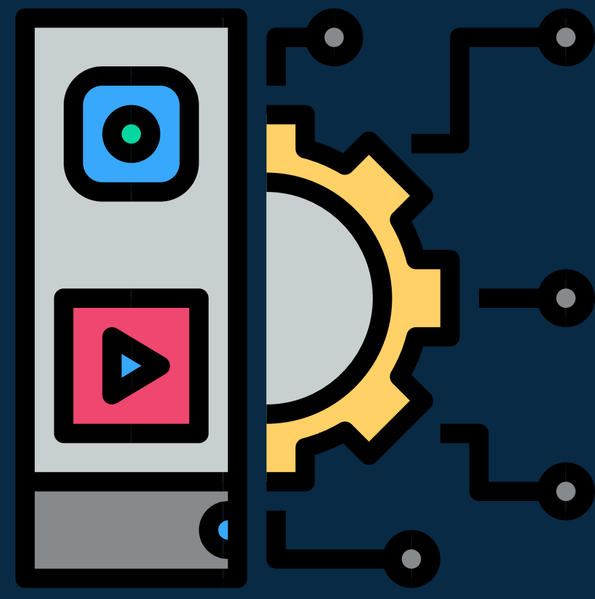
```
//////sum
select sum(Total_amount) from orders;
```

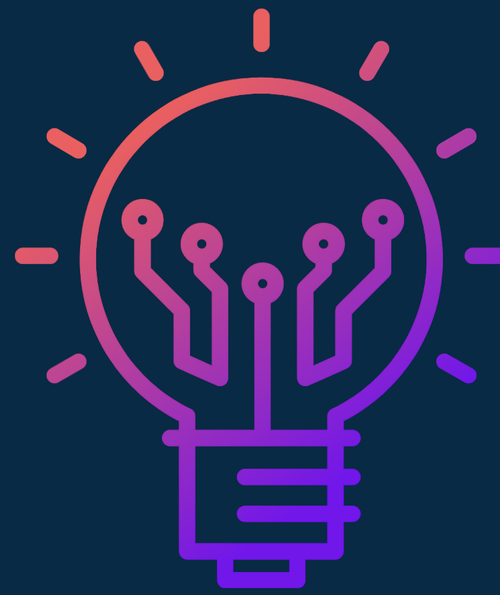
HERE IS THE **OUTPUT** :

Results | Explain | Describe | Saved SQL | History

2387

rows returned in 0.00 seconds Download





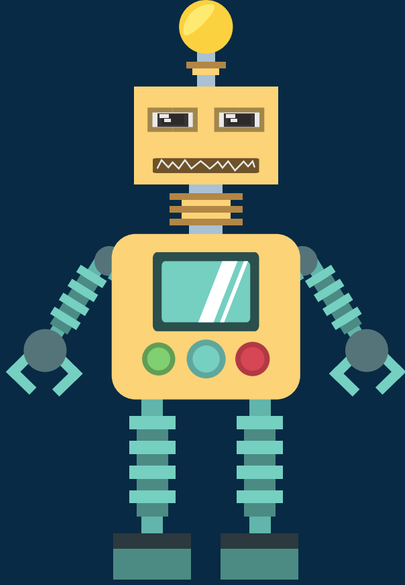
HERE IS THE **OUTPUT** :

Output:

AVG(TOTAL_AMOUNT)
2587

```sql
select avg(Total_amount) from orders;
```

```
///////current date
SELECT CURRENT_DATE FROM DUAL;
```



HERE IS THE **OUTPUT** :

OUTPUT::

Results | Explain | Describe | Saved SQL | History

CURRENT_DATE
01/17/2021

1 rows returned in 0.01 seconds Download

Order By Group By and Having Statement

THE ORDER BY KEYWORD IS USED TO SORT THE RESULT-SET IN ASCENDING OR DESCENDING ORDER.THE ORDER BY KEYWORD SORTS THE RECORDS IN ASCENDING ORDER BY DEFAULT. TO SORT THE RECORDS IN DESCENDING ORDER, USE THE DESC KEYWORD.

SYNTAX:-

```
SELECT COLUMN1, COLUMN2, … FROM
TABLE_NAME
```

```
//////ORDER BY
SELECT OrderID, BuyerID, Total_quantity FROM Orders ORDER BY Total_quantity;
```

HERE IS THE **OUTPUT** :

Results | Explain | Describe | Saved SQL | History

ORDERID	BUYERID	TOTAL_QUANTITY
21942566549	50345881058	1
85764031654	94908631679	2
96945305380	42711312958	4
47217024154	26350935579	5
07261862587	12714972662	6
05553373345	75521050479	7
99251300121	81921795835	8
90817183713	67711139299	9
89878325779	72330070747	11
70701609058	89264121725	13

10 rows returned in 0.01 seconds Download

GROUP BY:

THE GROUP BY STATEMENT GROUPS ROWS THAT HAVE THE SAME VALUES INTO SUMMARY ROWS, LIKE "FIND THE NUMBER OF CUSTOMERS IN EACH COUNTRY".THE GROUP BY STATEMENT IS OFTEN USED WITH AGGREGATE FUNCTIONS (COUNT, MAX, MIN, SUM, AVG) TO GROUP THE RESULT-SET BY ONE OR MORE COLUMNS.

SYNTAX:-

SELECT COLUMN_NAME(S) FROM TABLE_NAME
WHERE CONDITION GROUP BY COLUMN_NAME(S)
ORDER BY COLUMN_NAME(S);

GROUP BY:

EXMPLE

Query:

```
//////////////////  ALIAS / GROUP BY
select CardType,count(*) as popular from Payment group by CardType;
```

HERE IS THE OUTPUT :

Results | Explain | Describe | Saved SQL | History

CARDTYPE	POPULAR
America Express	2
Visa	3
JCR	3
Discover	2

4 rows returned in 0.03 seconds Download

HAVING:

THE HAVING CLAUSE WAS ADDED TO SQL BECAUSE THE WHERE KEYWORD COULD NOT BE USED WITH AGGREGATE FUNCTIONS.

SYNTAX:-

```sql
SELECT TOTAL_QUANTITY
FROM orders
WHERE TOTAL_QUANTITY>7
GROUP BY TOTAL_QUANTITY
HAVING TOTAL_QUANTITY>7
ORDER BY TOTAL_QUANTITY;
```

HERE IS THE **OUTPUT** :

Results | Explain | Describe | Saved SQL | History

TOTAL_QUANTITY
8
9
11
13

4 rows returned in 0.00 seconds Download

SELECT COLUMN_NAME(S) FROM TABLE_NAME

WHERE CONDITION GROUP BY COLUMN_NAME(S)
HAVING CONDITION ORDER BY COLUMN_NAME(S);
HAVING EXAMPLE

SUBQUERIES

A SUBQUERY IS A QUERY WITHIN ANOTHER SQL QUERY AND EMBEDDED WITHIN THE WHERE CLAUSE.A SUBQUERY IS USED TO RETURN DATA THAT WILL BE USED IN THE MAIN QUERY AS A CONDITION TO FURTHER RESTRICT THE DATA TO BE RETRIEVED.

- SUBQUERIES MUST BE ENCLOSED WITHIN PARENTHESES.
- A SUBQUERY CAN HAVE ONLY ONE COLUMN IN THE SELECT CLAUSE, UNLESS MULTIPLE COLUMNS ARE IN THE MAIN QUERY FOR THE SUBQUERY TO COMPARE ITS SELECTED COLUMNS.
- AN ORDER BY COMMAND CANNOT BE USED IN A SUBQUERY, ALTHOUGH THE MAIN QUERY CAN USE AN ORDER BY. THE GROUP BY COMMAND CAN BE USED TO PERFORM THE SAME FUNCTION AS THE ORDER BY IN A SUBQUERY.
- SUBQUERIES THAT RETURN MORE THAN ONE ROW CAN ONLY BEUSED WITH MULTIPLE VALUE OPERATORS SUCH AS THE IN OPERATOR.

NESTED QUERIES

- THE SELECT LIST CANNOT INCLUDE ANY REFERENCES TO VALUESTHAT EVALUATE TO A BLOB, ARRAY, CLOB, OR NCLOB.
- A SUBQUERY CANNOT BE IMMEDIATELY ENCLOSED IN A SET

IN NESTED QUERIES, A QUERY IS WRITTEN INSIDE A QUERY. THE RESULT OF THE INNER QUERY IS USED IN THE EXECUTION OF THE OUTER QUERY.

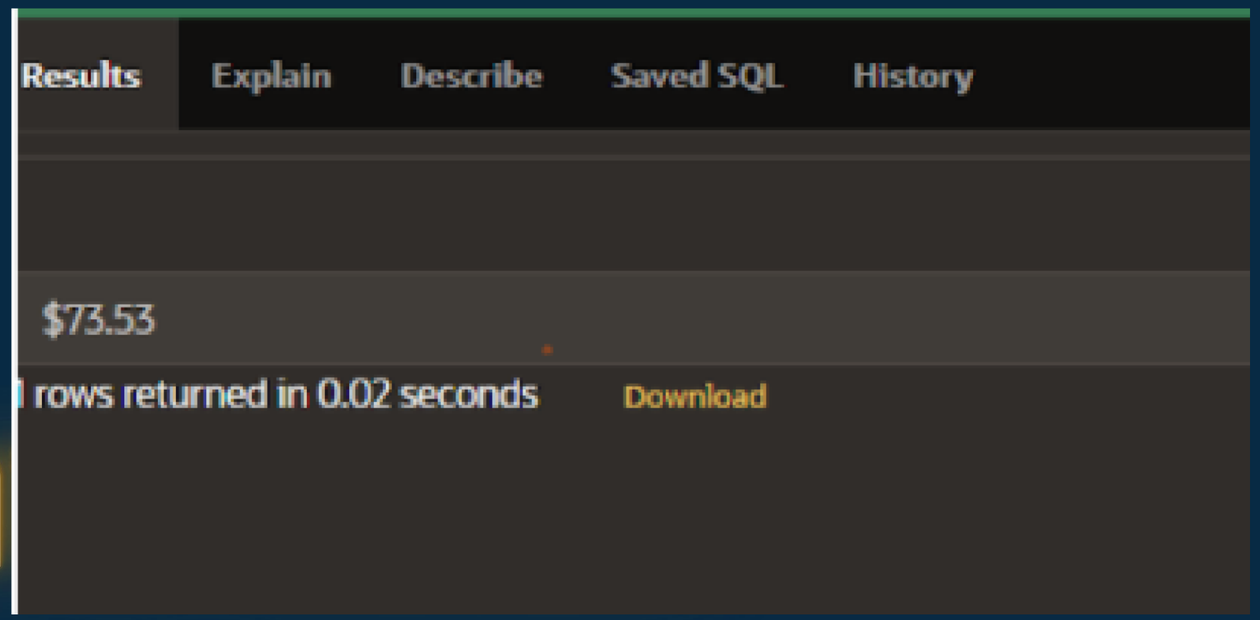
```
/////////////// NESTED QUERIES


select max(UnitPrice) as second_highest_price
from Products
where Products.UnitPrice<(select max(UnitPrice)
                          from Products);
```

HERE IS THE OUTPUT :

SYNTAX:- SINGLE SELECT COLUMN(S) FROM TABLE_NAME WHERE COLUMN IN/NOT IN(QUERY); MULTIPLE SELECT COLUMN(S) FROM TABLE_NAME WHERE COLUMN IN/NOT IN(QUERY2 IN/NOT IN(QUERY(S)) EXAMPLES

(II) CORRELA



CORRELATED SUBQUERIES ARE USED FOR ROW-BY-ROW PROCESSING. EACH SUBQUERY IS EXECUTED ONCE FOR EVERY ROW OF THE OUTER QUERY.A CORRELATED SUBQUERY IS EVALUATED ONCE FOR EACH ROW PROCESSED BY THE PARENT STATEMENT. THE PARENT STATEMENT CAN BE A SELECT, UPDATE, OR DELETE STATEMENT.

SYNTAX:-

```
SELECT COLUMN1, COLUMN2, .... FROM TABLE1 OUTER WHERE
COLUMN1 OPERATOR  (SELECT COLUMN1 FROM
TABLE2  WHERE EXPR1 = OUTER.EXPR2);
```

```sql
SELECT *
FROM Products
WHERE QuantityOnHand >
(SELECT AVG(QuantityOnHand)
FROM Products
);
```

HERE IS THE OUTPUT :

Results | Explain | Describe | Saved SQL | History

PRODUCTID	PRODUCTNAME	SUPPLIERID	CATEGORY
206908-3232	Remover	31704489846	Lip
096419-4823	Beauty	30918186609	Cheek
197710-3876	Lotion	70268860023	Eye, Face
533169-3365	Shampoo	30751277561	Body, Hair
998757-5991	Sets	43636501698	-

rows returned in 0.01 seconds Download

EXAMPLE

SEQUENCE IS A SET OF INTEGERS 1, 2, 3, . . . THAT ARE GENERATED AND SUPPORTED BY SOME DATABASE SYSTEMS TO PRODUCE UNIQUE VALUES ON DEMAND.

A SEQUENCE IS A USER DEFINED SCHEMA BOUND OBJECT THAT GENERATES A SEQUENCE OF NUMERIC VALUES. SEQUENCES ARE FREQUENTLY USED IN MANY DATABASES BECAUSE MANY APPLICATIONS REQUIRE EACH ROW IN A TABLE TO CONTAIN A UNIQUE VALUE AND SEQUENCES PROVIDE AN EASY WAY TO GENERATE THEM.

CREATE/DROP SEQUENCE:

CREATE :

SYNTAX TO CREATE A SEQUENCE IS,

```
CREATE SEQUENCE sequence-name
    START WITH initial-value
    INCREMENT BY increment-value
    MAXVALUE maximum-value
    CYCLE | NOCYCLE;
```

THE INITIAL-VALUE SPECIFIES THE STARTING VALUE FOR THE SEQUENCE.

THE INCREMENT-VALUE IS THE VALUE BY WHICH SEQUENCE WILL BE INCREMENTED.

THE MAXIMUM-VALUE SPECIFIES THE UPPER LIMIT OR THE MAXIMUM VALUE UPTO WHICH SEQUENCE WILL INCREMENT ITSELF.
THE KEYWORD CYCLE SPECIFIES THAT IF THE MAXIMUM VALUE EXCEEDS THE SET LIMIT, SEQUENCE WILL RESTART ITS CYCLE FROM THE BEGINING.

AND, NO CYCLE SPECIFIES THAT IF SEQUENCE EXCEEDS MAXVALUE VALUE, AN ERROR WILL BE THROWN.

EXAMPLE:

LET'S START BY CREATING A SEQUENCE, WHICH WILL START FROM 1, INCREMENT BY 1 WITH A MAXIMUM VALUE OF 999.

```
CREATE SEQUENCE seq_1
START WITH 1
INCREMENT BY 1
MAXVALUE 999
CYCLE;
```

Syntax:

DROP SEQUENCE schema_name.sequence_name;

```
DROP SEQUENCE [ IF EXISTS ] { database_name.schema_name.sequence_name | schema_
 [ ; ]
```

DROP SEQUENCE

ALTER SEQUENCE

ALTER SEQUENCE STATEMENT CAN BE USED TO CHANGE THE INCREMENT, MINIMUM AND MAXIMUM VALUES, CACHED NUMBERS, AND BEHAVIOR OF AN EXISTING SEQUENCE. THIS STATEMENT AFFECTS ONLY FUTURE SEQUENCE NUMBERS.

Syntax:

```
ALTER SEQUENCE [ IF EXISTS ] name
    [ AS data_type ]
    [ INCREMENT [ BY ] increment ]
    [ MINVALUE minvalue | NO MINVALUE ] [ MAXVALUE maxvalue | NO MAXVALUE ]
    [ START [ WITH ] start ]
    [ RESTART [ [ WITH ] restart ] ]
    [ CACHE cache ] [ [ NO ] CYCLE ]
    [ OWNED BY { table_name.column_name | NONE } ]
```

```
CREATE TABLE ordprod ( o_id NUMBER NOT NULL, nam
--Creating a sequence to insert values in o_id
```

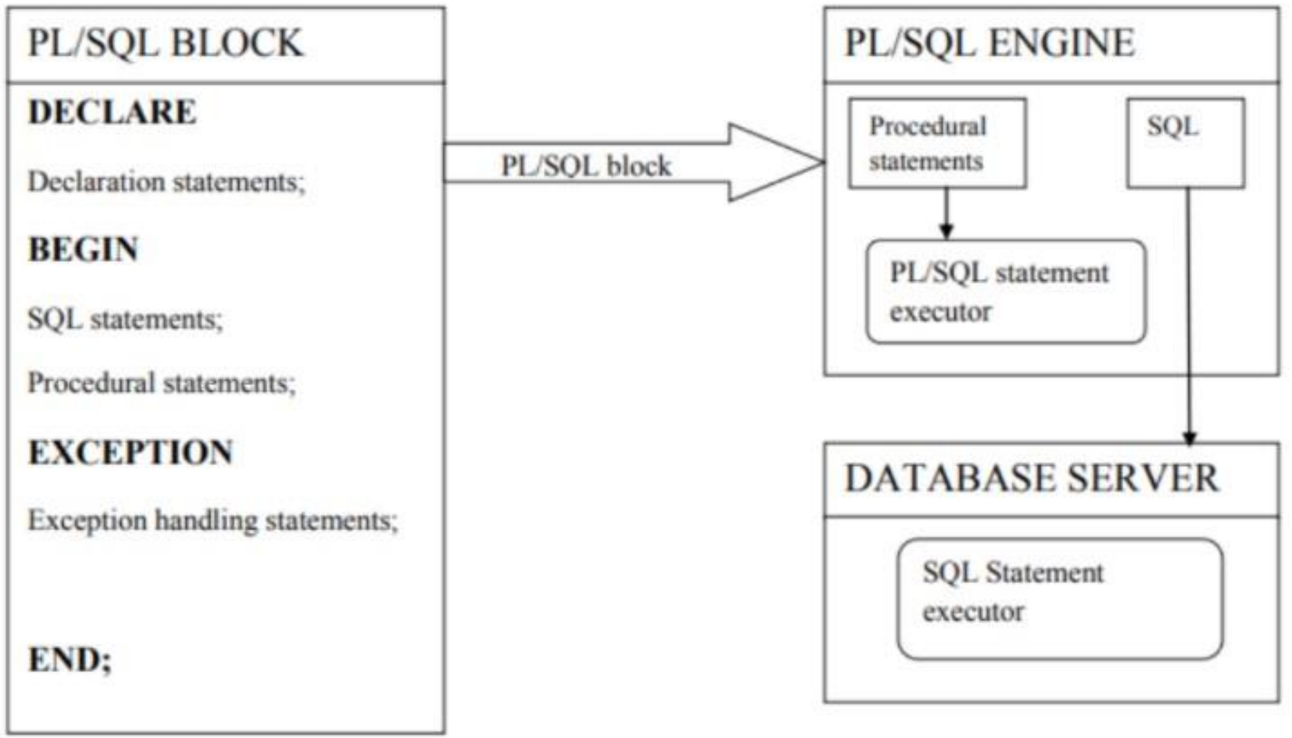
Results | Explain | Describe | Saved SQL | History

O_ID	NAME
22	Order5
1	Order1
2	Order2
5	Order5
62	Order4

INTRODUCTION TO PL/SQL

PL/SQL IS A COMBINATION OF SQL ALONG WITH THE PROCEDURAL FEATURES OF

PROGRAMMING LANGUAGES. IT WAS DEVELOPED BY ORACLE CORPORATION IN THE EARLY 90’S TO ENHANCE THE



CAPABILITIES OF SQL.

PL/SQL IS A BLOCK-STRUCTURED LANGUAGE; THIS MEANS THAT THE PL/SQL PROGRAMS ARE DIVIDED AND WRITTEN IN LOGICAL BLOCKS OF CODE. EACH BLOCK CONSISTS OF THREE SUB-PARTS -

1. DECLARATIONS

This section starts with the keyword DECLARE. It is an optional section and defines all variables, cursors, subprograms, and other elements to be used in the program.

SYNTAX OF PL/SQL:

2. EXECUTABLE COMMANDS

- This section is enclosed between the keywords BEGIN and END and it is a mandatory section. It consists of the executable PL/SQL statements of the program.

3. EXCEPTION HANDLING

This section starts with the keyword EXCEPTION. This optional section contains exception(s) that handle errors in the program. Every PL/SQL statement ends with a semicolon (;). PL/SQL blocks can be nested within other PL/SQL blocks using BEGIN and END.

TRIGGERS

Triggers are stored programs, which are automatically executed or fired when some events

occur. Triggers are, in fact, written to be executed in response to any of the following events:-

1. A database manipulation (DML) statement (DELETE, INSERT, or UPDATE)
2. A database definition (DDL) statement (CREATE,ALTER, or DROP)
3. A database operation (SERVERERROR, LOGON, LOGOFF, STARTUP, or SHUTDOWN) Triggers can be defined on the table, view, schema, or database with which the event is associated

ADVANTAGES

1) It helps in maintaining the integrity constraintsin the database tables, especially when the
primary key and foreign key constraints are not defined.
2) It sometimes also helps in keeping the SQLcodes short and simple as I show in the real-life example.
3) It helps in maintaining the track of all thechanges (update, deletion and insertion) occurs in the tables through inserting the changes values in the audits tables.

DISADVANTAGES

1) Hard to maintain since this may be a possibilitythat the new developer isn't able to know about the trigger defined in the database and wonder how data is inserted, deleted or updated automatically.
2) They are hard to debug since they are difficultto view as compared to stored procedures, views, functions, etc.
3) If complex code is written in the triggers, thenit will slow down the performance of the applications.

2.)After event

4.)STATEMENT

1.)Before event

3.)Row Trigger:

TRIGGER: A

Triggers: BEFORE Triggers: A row trigger is FIRED ONCE ON BEHALFSTATEMENT TRIGGER IS

triggers run the AFTER triggers fired each time OF THE TRIGGERING

STATEMENT,

trigger action run the trigger the table is REGARDLESS OF THE

NUMBER OF ROWS IN

before the action after the affected by the THE TABLE THAT THE triggering triggering

triggering STATEMENT AFFECTS,TRIGGERING statement is run. statement. EVEN IF NO ROWS

AREAFFECTED

statement is run.

TYPES OF TRIGGERS

USE OF TRIGGER IN OUR PROJECT

```
create table Products_1 as (select * from Products);
create table Stockcheck (ProductID varchar2(11), Stocklevel varchar2(100));



Create or Replace trigger stocklevel
BEFORE insert on Products_1
FOR EACH ROW
begin
case when (:new.QuantityOnHand <= 300)
then insert into Stockcheck (ProductID, Stocklevel)
values(:new.ProductID,'Low-stock');
END case;
END;
```

HERE IS THE **OUTPUT** :

```
Trigger created.
```

PRODUCTID	STOCKLEVEL
)96419-4825	Low-stock

CURSORS

Implicit cursor - Implicit cursors are automatically created by Oracle whenever an SQL statement is executed, when there is no explicit cursor for the statement. Programmers cannot control the implicit cursors and the information in it. Whenever a DML statement (INSERT, UPDATE and DELETE) is issued, an implicit cursor is associated with this statement. For INSERT operations, the cursor holds the data that needs to be inserted. For UPDATE and DELETE operations, the cursor

identifies the rows that would be affected. In PL/SQL, you can refer to

the most recent implicit cursor as the SQL cursor, which always has attributes such as %FOUND, %ISOPEN, %NOTFOUND, and %ROWCOUNT. The SQL cursor has additional attributes, %BULK ROWCOUNT and %BULK EXCEPTIONS, designed for use with the FORALL statement. Any SQL cursor attribute will be accessed as sql%attribute

name as shown below in the example

II. EXPLICIT CURSOR - EXPLICIT CURSORS ARE PROGRAMMER-DEFINED CURSORS FOR GAINING MORE CONTROL OVER THE CONTEXT AREA. AN EXPLICIT CURSOR SHOULD BE DEFINED IN THE DECLARATION SECTION OF THE PL/SQL

BLOCK. IT IS CREATED ON A SELECT STATEMENT WHICH RETURNS MORE THAN ONE ROW. THE SYNTAX FOR CREATING AN EXPLICIT CURSOR IS:-

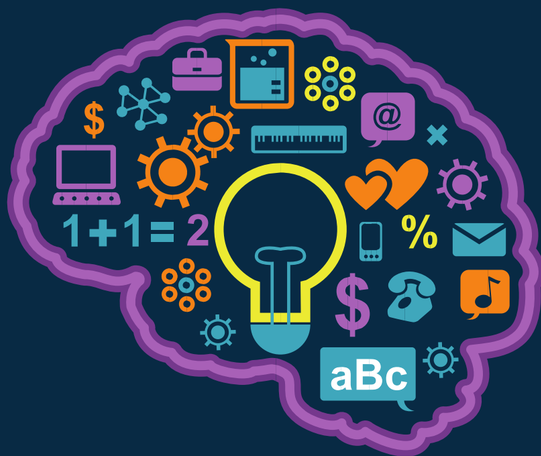
```
CURSOR cursor_name IS select_statement;
```

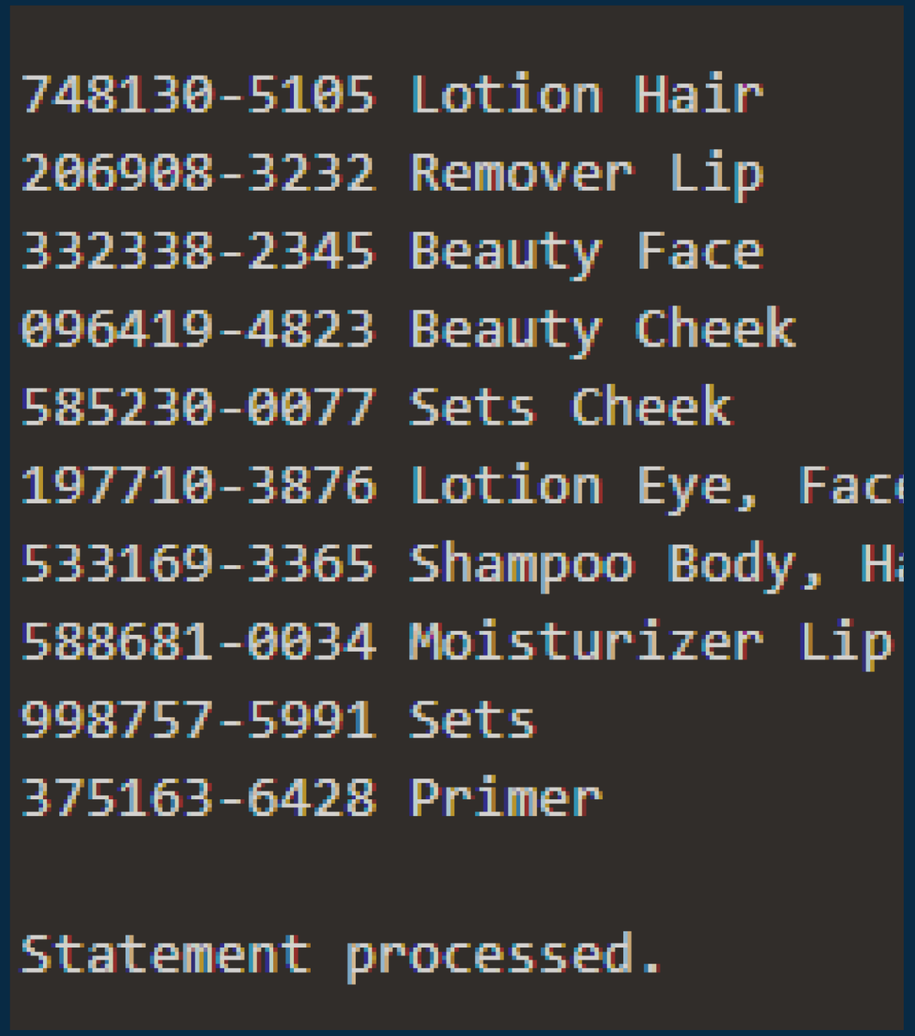
EXPLICIT CURSORS CAN BE DECLARED, OPENED, FETCHED AND CLOSED AS IN THE PRECEDING SECTION.

USE OF CURSOR IN OUR PROJECT

```
---cursor
DECLARE
    p_id Products.ProductID%type;
    p_name Products.ProductName%type;
    p_catg Products.Category%type;
    CURSOR p_products is
        SELECT ProductID, ProductName, Category FROM Products;
BEGIN
    OPEN p_products;
    LOOP
    FETCH p_products into p_id, p_name, p_catg;
        EXIT WHEN p_products%notfound;
        dbms_output.put_line(p_id || ' ' || p_name || ' ' || p_catg);
    END LOOP;
    CLOSE p_products;
END;
```

HERE IS THE OUTPUT :





VIEWS IN SQL ARE A KIND OF VIRTUAL TABLE. A VIEW ALSO

VIEWS

HAS ROWS AND COLUMNS AS THEY ARE IN A REAL TABLE IN THE DATABASE. WE CAN CREATE A VIEW BY SELECTING FIELDS FROM ONE OR MORE TABLES PRESENT IN THE DATABASE. A VIEW CAN EITHER HAVE ALL THE ROWS OF A TABLE OR SPECIFIC ROWS BASED ON CERTAIN CONDITIONS.

Syntax:

```
INSERT INTO view_name(column1, column2 , column3,..) VALUES(value1,
value2, value3..);
```

This will insert a row in a view.

WE CAN PERFORM VARIOUS TYPES OF OPERATION LIKE INSERT/UPDATE/DELETE IN A ROW IN VIEWS.

Syntax:

DELETE FROM view_name WHERE condition;

This will delete a row from the view.

TYPES OF VIEWS

materialized view

Oracle Database creates one internal table and at least one index, and may create one view, all in the schema of the materialized views. Oracle Database uses these objects to maintain the materialized views in SQL data..

view resolution

When you read from a view, or join a view to an existing query the SQL server will then execute the query in the view and join it to your data set. When it does that, that would be view resolution.

features /advantages of views

SECURITY

Each user can be given permission to access the database only through a small set of views

QUERY SIMPLICITY

A view can draw data from several different tables and present it as a single table, turning multi-table queries into single-table queries against the view

STRUCTUTAL SIMPLICITY

Views can give a user a "personalized" view of the database structure, presenting the database as a set of virtual tables that make sense for that user.

CONSISTENCY

A view can present a consistent, unchanged image of the structure of the database, even if the underlying source tables are split, restructured, or renamed.

DATA INTEGRITY

If data is accessed and entered through a view, the DBMS can

LOGICAL DATA INDEPENDENCE

Views can make the application and database tables to a certain extent independent. If there is no view, the application must be based on a table. With the view, the program can be

CREATE VIEW TO CREATE A NEW VIEW

Query:

```
////////////////////  VIEW
create view pop as
select ProductName,ItemQuantity from Products inner join Order_details on Products.ProductID = Order_Details.ProductID;
select ProductName, sum(ItemQuantity) from pop group by ProductName;
```

Syntax :

```
CREATE VIEW view_name AS
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

automatically check the data to established in view of above, to view the ensure that it meets the program with a database table to be separated. specified integrity constraints.

Output:

Results | Explain | Describe | Saved SQL | History

PRODUCTNAME	SUM(ITEMQUA
Lotion	86
Moisturizer	9
Primer	81
Shampoo	11
Sets	99
Remover	76
Beauty	91

DROP VIEW TO DROP A VIEW

Query:

```
DROP view pop;
```

Syntax 2:

DROP VIEW view_name;

Results | Explain | Describe

View dropped.

0.08 seconds

THANK YOU