Group number : 1

Group Formation and Conceptual Data Model with the Relational Database RDB schema diagram

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1.INTRODUCTION

In this report we will design Data Base for Eharaj site , That is for viewing items and sells them .
We are using Microsoft SQL Server Management Studio , to create DDL and DML .

2.PROJECT DESCRIPTION

Consider a computer online auction store where clients (purchasers and suppliers) participate in
the sales process for the electronic items. the requirements are summarized as follows to build the database for eHaraj:

• The online site has Clients, each of whom is identified by a unique client id and is also described by an email, name which consist of first and last name, password, client address and phone numbers; where each
client may add more than one phone numbers.

- ▪ All the clients' attributes cannot be null in the database.

• A client should be either: a purchaser (i.e. who buy items), or a supplier (i.e. who sell items).

- A purchaser has a billing address in addition.
- A supplier has a bank account number in addition.
  - ▪ Billing address cannot be null.
  - ▪ bank account number cannot be null, and need to be checked that account number length is = 10

• The database also stores the Items, items are placed and owned by a Supplier, and each item in database
should belong to one supplier. Items are identified by a unique item id, also items described by an item name
(i.e. product name), item manufacturer name, items languages (i.e. means that the languages that the computer or printer provide, such as Arabic, English ..etc), items used months (i.e. means that how many months this
item been used by supplier, since it is auction and the items may not be new), a description, starting bid price, the start date of the auction, and the end date of the auction.

- ▪ All the items' attributes cannot be null in the database.
- ▪ The end date of the auction should be checked to be >= start date of the auction

• An Items should be either: Computer, or Printer.

- A Computer have in addition a speed, memory, and storage.
- A Printer have in addition is_wireless , Inkjet and is_contain_scanner.
  - ▪ All the attributes of computer and printer cannot be null.

• Purchaser (i.e., the bidder) may make one or more bids, and those bids are identified by Bid id, and also described by, proposed price (i.e. the price the purchaser proposed to buy the item), and bid date. Each bid proposed by one and only one purchaser.

- ▪ All the attributes of bid cannot be null.

• Bids are done on the items; each item may have one to many bids. Each bid assigned to one and only one item (i.e., means that the bid done on one specific item).
• Each Bid has a billing. A billing is identified by a unique bill id, also described by billing date. Each bill should assign to one and only one bid, also each bid may assign to only one bill.

- All the attributes of billing cannot be null.
- (Note to be considered in phase 2: only the purchaser with winner bid of an item higher price will have a bill, and if the purchaser wins in many items; each bid will have separate bill)

• The client may record one to many feedbacks. The feedback is identified and attached to both client and billing. Each feedback written by one and only one client, also written on one and only one bill.
Having feedback is optional. Feedback is identified by feedback description and also described by a rating.

- Rating should be checked to be ranged between 1 and 5.
- feedback description cannot be null

PHASE 1

Conceptual EER Model

Data Modeling Tool:

We used:

- **Lucidchart**
  https://www.lucidchart.com/
- **draw.io**
  https://app.diagrams.net/

Assumptions:

We assume that:

- **Not every supplier will place item, because maybe he only registered without putting any item.**

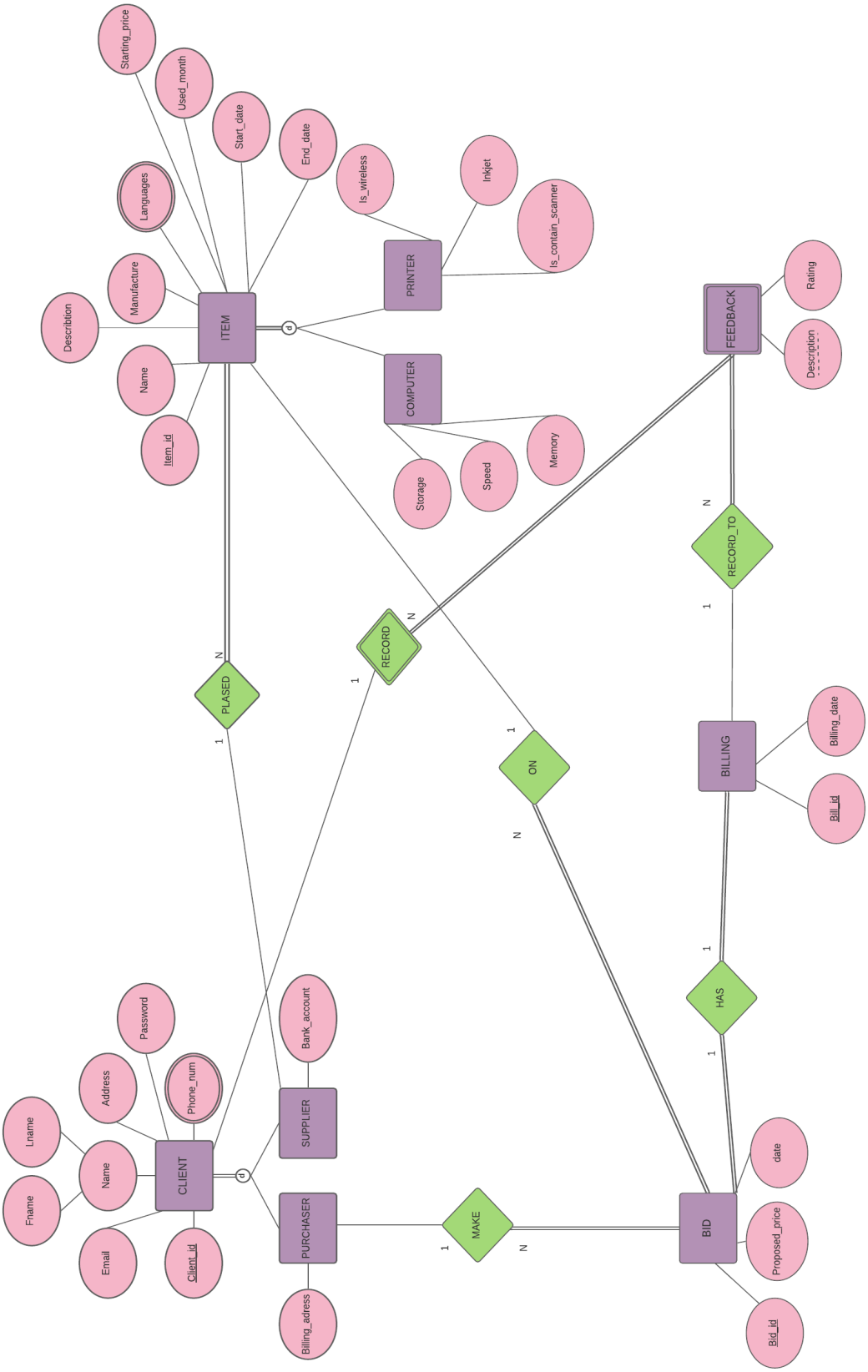
Description: ER Data Model component:

We are designing a database for online site which is EHARAJ it includes:

Entity	Attributes	Relationships
Client	- **client_id (as PK)** - **e-mail** - **name (composite attribute: first and last name)** - **password** - **client address** - **phone numbers (multivalued attribute)**	**Client may record feedback** - **client:partial participation** - **feedback: total participation** - **cardinality: one to many**
Purchaser (subclass of client)	- **billing_address**	**purchaser make bid** - **purchaser: partial participation** - **bid:total participation** - **cardinality: one to many**
Supplier (subclass of client)	- **bank_account**	**supplier placed Item** - **supplier: partial participation** - **item: total participation** - **cardinality: one to many**

Item	- **item_id(as PK)** - **item name** - **manufacturer_name** - **languages** - **used_months** - **description** - **starting_price** - **start_date of the auction** - **end_date of the auction**	
Computer (as subclass of Item)	- **speed** - **memory** - **storage**	
Printer (as subclass of Item)	- **is_wireless** - **Inkjet** - **is_contain_scanner.**	
Bid	- **Bid_id (as PK)** - **proposed _price** - **bid_date**	**Bid done <u>on</u> Item** - **bid: total participation** - **item:partial participation** - **cardinality: many to one** **Bid <u>has</u> billing** - **bid: total participation** - **billing:total participation** - **cardinality: one to one**
Billing	- **bill_id (as PK)** - **billing_date**	
Feedback (as weak entity for the client)	- **description (as partial key)** - **rating**	**feedback <u>record to</u> billing** - **feedback:total participation** - **billing:partial participation** - **cardinality: many to one**

Conceptual Data Model :

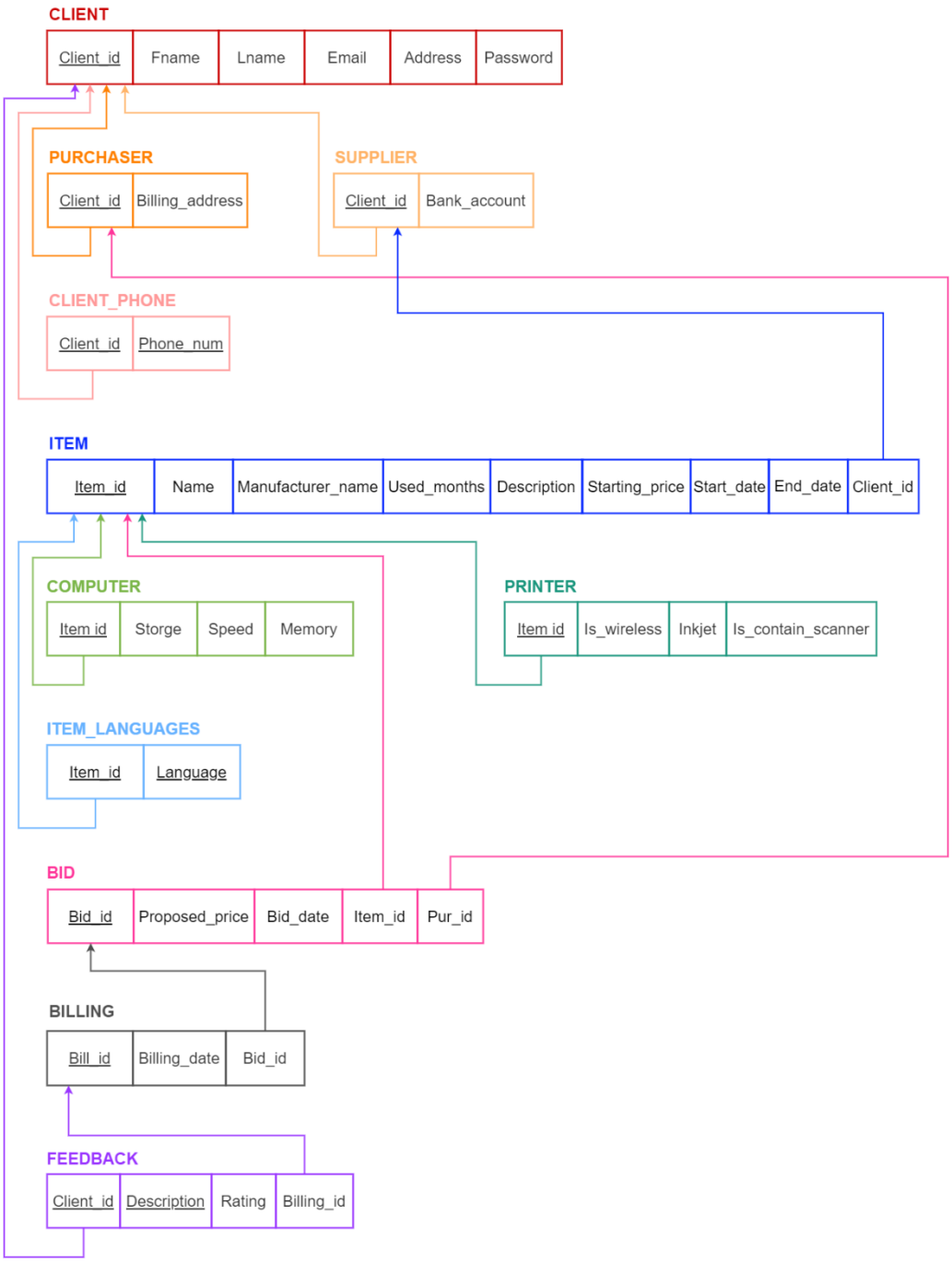


Relational Database Schema

Assumptions :

- **We used Foreign Key approach; we add Bid_id as FK in relation billing.**

Relational Database Schema :



PHASE2

Schema Definitions and Query Implementations

Table Creation:

Using SQL statement, we created **EHARAJ** tables as follows:

```
create table CLIENT (
	Client_id int not null,
	Fname varchar(15) not null,
	Lname varchar(15) not null,
	Email varchar(50) not null unique,
	Address varchar(50) not null,
	Password varchar(50) not null,
	primary key (Client_id) );

create table CLIENT_PHONE (
	Client_id int not null,
	Phone_number varchar(15) not null,
	primary key (Client_id,Phone_number),
	FOREIGN KEY (Client_id) REFERENCES CLIENT (Client_id)
	on delete cascade on update cascade);

create table PURSHASER (
	Client_id int not null,
	Billing_address varchar(50) not null,
	primary key (Client_id),
	FOREIGN KEY (Client_id) REFERENCES CLIENT (Client_id)
	on delete cascade on update cascade);

create table SUPPLIER (
	Client_id int not null,
	Bank_account int  not null CHECK(LEN(Bank_account)=10),
	primary key (Client_id),
	FOREIGN KEY (Client_id) REFERENCES CLIENT (Client_id)
	on delete cascade on update cascade);

CREATE TABLE ITEM (
	Item_id	INT	NOT NULL,
	Name VARCHAR(50) NOT NULL,
	Manufacturer_name VARCHAR(15) NOT NULL,
	Used_months	INT NOT NULL,
	Description	VARCHAR(500) NOT NULL,
	Starting_price float  NOT NULL,
	Start_date DATE NOT NULL,
	End_date DATE NOT NULL ,
	CONSTRAINT date_ck check (End_date>= Start_date ),
	Client_id INT NOT NULL,
	PRIMARY KEY (Item_id),
	FOREIGN KEY (Client_id) REFERENCES CLIENT (Client_id)
	on delete cascade on update cascade);
```

```
CREATE TABLE COMPUTER (
	Item_id INT NOT NULL,
	Storage VARCHAR(20) NOT NULL,
	Speed VARCHAR(10) NOT NULL,
	Memory VARCHAR(20) NOT NULL,
	PRIMARY KEY (Item_id),
	FOREIGN KEY (Item_id) REFERENCES ITEM (Item_id)
	on delete cascade on update cascade);


CREATE TABLE PRINTER (
	Item_id INT NOT NULL,
	Is_wireless bit NOT NULL,
	Inkjet bit NOT NULL,
	Is_contain_scanner bit  NOT NULL,
	PRIMARY KEY (Item_id),
	FOREIGN KEY (Item_id) REFERENCES ITEM (Item_id)
	on delete cascade on update cascade);

create table ITEM_LANGUAGES(
	Item_id int NOT NULL,
	Language VARCHAR (100) NOT NULL,
	Primary Key (Item_id ,Language),
	FOREIGN KEY (Item_id ) REFERENCES ITEM (Item_id )
	on delete cascade on update cascade);

create table BID(
	Bid_id int NOT NULL,
	Proposed_price  float not null ,
	Bid_date Date NOT NULL,
	Item_id int NOT NULL,
	Pur_id int  NOT NULL,
	Primary Key (Bid_id),
	FOREIGN KEY (Item_id) REFERENCES ITEM (Item_id) on delete cascade on update
	cascade,
	FOREIGN KEY (Pur_id) REFERENCES PURSHASER(Client_id )
	on delete cascade on update cascade);

create table BILLING (
	Bill_id int NOT NULL,
	Billing_date Date NOT NULL,
	Bid_id int NOT NULL,
	Primary KEY (Bill_id),
	FOREIGN KEY (Bid_id ) REFERENCES  BID (Bid_id)
	on delete cascade on update cascade);


create table FEEDBACK (
	Client_id int NOT NULL,
	Description VARCHAR(500) NOT NULl,
	Rating int   check ( Rating>=1 AND Rating<=5  ),
	Bill_id int NOT NULL,
	Primary Key ( Client_id , Description),
```

```
FOREIGN KEY (Client_id) REFERENCES CLIENT (Client_id) on delete cascade on
update cascade,
FOREIGN KEY (Bill_id) REFERENCES BILLING (Bill_id)
on delete cascade on update cascade);
```

Database State:

We insert some values into the database in order to test our SQL create view and query statement.

- **INSERTION OF TABLE CLIENT:**

```
insert into CLIENT
values (11,'Mohammed' ,'Ahmed','ma@gmail.com','Riyadh,SA','1234');

insert into CLIENT
values (12,'Mohammed' ,'Saad','ms@gmail.com','Jedah,SA','123454');

insert into CLIENT
values (13,'Abdullah' ,'Ahmed','aa@gmail.com','Riyadh,SA','12555d34');

insert into CLIENT
values (14,'Mhmoud' ,'Faisal','mf@gmail.com','Dammam,SA','qaws');

insert into CLIENT
values (15,'Sauod' ,'Ahmed','sa@gmail.com','Makkah,SA','swadef');

insert into CLIENT
values (16,'Abdulrahman','Abdullah','aab@gmail.com','Riyadh,SA','qawsedrftg');

insert into CLIENT
values (17,'Saad','Masoud','sam@gmail.com','UAE','qayrftg');

insert into CLIENT
values (18,'Abdulazia','Abdullah','abab@gmail.com','Riyadh,SA','qawdg');

insert into CLIENT
values (19,'Salman','Nayef','sal@gmail.com','Jeddah,SA','qawseug');

insert into CLIENT
values (20,'Khaled','Ahmed','KA@gmail.com','Abha,SA','q88rftg');

insert into CLIENT
values (21,'Ibrahim','Mohammed','Im@gmail.com','Riyadh,SA','12334567');

insert into CLIENT
values (22,'Faisal','Salman','fs@gmail.com','Qasim,SA','qawsedrftg');
```

- ## INSERTION OF TABLE PURSHASER:

```
insert into PURSHASER
values (17,'UAE');

insert into PURSHASER
values (18,'Riyadh,SA');

insert into PURSHASER
values (19,'Jeddah,SA');

insert into PURSHASER
values (20,'Abha,SA');

insert into PURSHASER
values (21,'Riyadh,SA');

insert into PURSHASER
values (22,'Qasim,SA');
```

- ## INSERTION OF TABLE SUPPLIER:

```
insert into SUPPLIER
values (11,1234567891);

insert into SUPPLIER
values (14,1234567890);

insert into SUPPLIER
values (15,1234567892);

insert into SUPPLIER
values (12,1234567893);

insert into SUPPLIER
values (13,1234567894);

insert into SUPPLIER
values (16,1234567895);
```

INSERTION OF TABLE CLIENT_PHONE:

```
insert into CLIENT_PHONE
values (15,053315151);

insert into CLIENT_PHONE
values (15,053335151);

insert into CLIENT_PHONE
values (13,053444451);

insert into CLIENT_PHONE
values (14,053311111);

insert into CLIENT_PHONE
values (12,053316651);

insert into CLIENT_PHONE
values (11,0544451511);

insert into CLIENT_PHONE
values (16,0533666666);
insert into CLIENT_PHONE
values (17,053322222);

insert into CLIENT_PHONE
values (18,053315123);

insert into CLIENT_PHONE
values (19,053315333);

insert into CLIENT_PHONE
values (20,056315151);

insert into CLIENT_PHONE
values (21,054445151);

insert into CLIENT_PHONE
values (22,053888151);

insert into CLIENT_PHONE
values (22,051533151);

insert into CLIENT_PHONE
values (18,053333351);
```

- **INSERTION OF TABLE ITEM:**

```
insert into ITEM
values (1,' XPS 13 9370',' DELL', 1,' Dell XPS 13 9370 Laptop: Core i7-8550U, 8GB RAM,
256GB SSD, 13.3" Full HD IPS Display, Backlit Keyboard, Windows 10', 5100,
'11/11/2008', '11/12/2008', 11);

insert into ITEM
values (2,'Canon Pixma TR150' , 'Canon' , 3 ,'Canon Pixma TR150 Wireless Mobile
Printer With Airprint And Cloud Compatible, Black', 900, '12/6/2021', '12/30/2021',
16);

insert into ITEM
values (3,'HP 15.6" HD Micro-edge' ,'HP', 5,'HP 15.6" HD Micro-edge TouchScreen
Laptop, Intel Core i3-1115G4 up to 4.1GHz, 12GB DDR4, 512GB PCIe NVMe SSD, Webcam,
WiFi, Bluetooth, HDMI, USB Type-C, Media Card Reader, Windows 10 S, ABYS Mouse Pad',
2000, '11/11/2020', '11/16/2020', 13);

insert into ITEM
values (4,'HP LaserJet Pro M404n' ,'HP', 0,'HP LaserJet Pro M404n Printer',
750,'11/11/2020', '11/20/2020', 12);

insert into ITEM
values (5,'Epson EcoTank L3150' ,'Epson', 4,'Epson EcoTank L3150 Print/Scan/Copy Wi-Fi
Tank Printer', 500,'12/1/2021','25/12/2021', 14);

insert into ITEM
values (6,'Lenovo Legion 5', ' Lenovo', 0,' Lenovo Legion 5, Intel Core i7-10750H,
15.6" FHD, 16 GB RAM, 1TB HDD + 256GB SSD, Nvidia GTX1660Ti 6GB, Eng-Arb, Windows 10
Home, Phantom Black-[81Y6009NAX] 2 Year Warranty',8000,'12/6/2021', '12/22/2021', 16);

insert into ITEM
values (7,'Brother MFC-J497DW','Brother', 7,'Brother MFC-J497DW Inkjet Multifunction
Printer - Color - Plain Paper Print - Desktop', 800, '10/6/2011', '10/22/2011', 15);

insert into ITEM
values (8,'ASUS ROG Strix G15','Asus', 10,'ASUS ROG Strix G15 (2021) Gaming Laptop,
15.6” 300Hz IPS Type FHD Display, NVIDIA GeForce RTX 3060, AMD Ryzen 9 5900HX, 16GB
DDR4, 512GB PCIe NVMe SSD, RGB Keyboard, Windows 10, G513QM-EB94',
5000,'12/5/2021','21/28/2021', 12);

insert into ITEM
values (9,'Lexmark MS810DE Laser Printer','Lexmark', 6, 'Lexmark MS810DE Laser Printer
- Monochrome - 1200 x 1200 dpi Print - Plain Paper Print - Desktop 40GT170',
6570,'12/5/2021','12/29/2021', 13);

insert into ITEM
values (10,'Acer Chromebook Spin 311 Convertible','Acer', 3,'Acer Chromebook Spin 311
Convertible Laptop, Intel Celeron N4020, 11.6" HD Touch, 4GB LPDDR4, 32GB eMMC,
Gigabit Wi-Fi 5, Bluetooth 5.0, Google Chrome, CP311-2H-C679',
900,'12/1/2021','12/5/2021', 11);

insert into ITEM
```

```
values (11,'MSI GF75','MSI',18,'2019 MSI GF75 Laptop 17.3" 120Hz FHD Gaming Computer| 9th Gen Intel Hexa-Core i7-9750H Up to 4.5GHz| 32GB DDR4 RAM| 512GB PCIE SSD + 1TB HDD| GeForce GTX 1050 Ti 4GB| Backlit Keyboard| Win 10', 3650, '12/1/2021', '12/31/2021', 15);

insert into ITEM
values (12,'Kyocera 1102S42US0 ECOSYS M2540dw','Kyocera', 13,'Kyocera 1102S42US0 ECOSYS M2540dw Black and White Multi-Functional Printer, Speed up to 42 ppm, Resolution up to 1200 dpi, Mobile Print Capabilities, 5 Line LCD Screen with Hard Key Control Panel', 2950, '1/1/2013', '1/25/2013', 16);
```

- **INSERTION OF TABLE COMPUTER:**

```
insert into COMPUTER
values (1,' 512 GB SSD', '1.80 GHz', '16 GB DDR4');

insert into COMPUTER
values (3,' 512 GB SSD', '1.70 GHz', ' 12GB DDR4');

insert into COMPUTER
values (6,'1TB HDD + 256GB SSD', ' 2.60 GHz', '16 GB DDR4');

insert into COMPUTER
values (8,' 512 GB SSD', ' 3.3 GHz', '16 GB DDR4');

insert into COMPUTER
values (10,'32GB eMMC', ' 1.10 GHz', ' 4GB LPDDR4');

insert into COMPUTER
values (11,'512GB SSD + 1TB HDD', ' 2.60 GHz', ' 32 GB DDR4');
```

- **INSERTION OF TABLE PRINTER:**

```
insert into PRINTER
values (2, 1, 1, 0);

insert into PRINTER
values (4, 1, 0, 0);

insert into PRINTER
values (5, 1, 1, 1);

insert into PRINTER
values (7, 1, 1, 1);

insert into PRINTER
values (9, 0, 0, 0);

insert into PRINTER values (12, 0, 1, 1);
```

- ## INSERTION OF TABLE ITEM_LANGUAGES :

```
Insert into ITEM_LANGUAGES
Values (1,'Arabic');

Insert into ITEM_LANGUAGES
Values ( 2 , 'Arabic');

Insert into ITEM_LANGUAGES
Values ( 2 , 'English');

Insert into ITEM_LANGUAGES
Values ( 2 , 'France');

Insert into ITEM_LANGUAGES
Values ( 3 , 'English');

Insert into ITEM_LANGUAGES
Values ( 4 , 'English');

Insert into ITEM_LANGUAGES
Values ( 5 , 'English');

Insert into ITEM_LANGUAGES
Values ( 6 ,'English' );

Insert into ITEM_LANGUAGES
Values (7,'Arabic');

Insert into ITEM_LANGUAGES
Values ( 8 , 'Arabic');

Insert into ITEM_LANGUAGES
Values ( 9 , 'English');

Insert into ITEM_LANGUAGES
Values ( 10 , 'English');

Insert into ITEM_LANGUAGES
Values ( 11, 'English');

Insert into ITEM_LANGUAGES
Values ( 12,'English' );

Insert into ITEM_LANGUAGES
Values ( 11, 'Arabic');
```

- **INSERTION OF TABLE BID :**

```
Insert into BID
Values ( 11 , 6570, '12/10/2021', 2 , 17);

Insert into BID
Values ( 22 , 550 , '12/8/2021', 6, 18);

Insert into BID
Values ( 33, 2060.5, '11/15/2020', 3 , 19);

Insert into BID
Values ( 44 , 800, '11/19/2020' , 4 , 20);

Insert into BID
Values ( 55, 5500, '12/10/2021' , 8, 21);

Insert into BID
Values ( 66 , 3700,'12/25/2021' ,11 , 22);
```

- **INSERTION OF TABLE BILLING :**

```
Insert into BILLING
Values (  01 , '12/30/2021', 11);

Insert into BILLING
Values (  02 , '12/22/2021',22);

Insert into BILLING
Values (  03 , '11/16/2020', 33 );

Insert into BILLING
Values (  04 , '11/20/2020',44);

Insert into BILLING
Values (   05 , '12/28/2021', 55 );

Insert into BILLING
Values (   06 , '12/31/2021', 66 );
```

- **INSERTION OF TABLE FEEDBACK:**

```
Insert into FEEDBACK
Values ( 17  , '//  I bought printer 1  months I did not use it? as it is not
connecting to any computer! ', 2 , 01);

Insert into FEEDBACK
Values ( 18 , ' //  Love my new computer, fast, easy to use,very thin and takes up
little space! ' , 5 , 02 );
```

```
Insert into FEEDBACK
Values ( 19 , '  // I bought  printer  Very good saving of cartilage ink Difficult
setup Better to use usb connections For better wifi connections ' , 3 , 03 );

Insert into FEEDBACK
Values ( 20 , '   // I bought  printer   Works fine. The ink type is good. Has wifi
printing. Support printing through a specific e-mail. Scannning paper easy and give
you a small PDF size so can be used easly to upload it any where online ' ,5 , 04 );

Insert into FEEDBACK
Values ( 21 , '  the bad thing is the   is making loud voice even though I am not
running any apps or website.                                                    '
, 5 , 05 );

Insert into FEEDBACK
Values (  22 , '  // I bought computer, It was all good in the beginning. But after 3
months of using, it starts to have problems. First, when I open more than 3 windows,
the screen starts to flash, and pixels are not clear. Second, no sound after using for
about 4-5 hours. ' , 3 , 06 );
```

Screenshot:

CLIENT

Client_id	Fname	Lname	Email	Address	Password
11	Mohammed	Ahmed	ma@gmail.com	Riyadh,SA	1234
12	Mohammed	Saad	ms@gmail.com	Jedah,SA	123454
13	Abdullah	Ahmed	aa@gmail.com	Riyadh,SA	12555d34
14	Mhmoud	Faisal	mf@gmail.com	Damma...	qaws
15	Sauod	Ahmed	sa@gmail.com	Makkah,...	swadef
16	Abdulrahman	Abdullah	aab@gmail.com	Riyadh,SA	qawsedrftg
17	Saad	Masoud	sam@gmail.com	UAE	qayrftg
18	Abdulazia	Abdullah	abab@gmail.com	Riyadh,SA	qawdg
19	Salman	Nayef	sal@gmail.com	Jeddah,SA	qawseug
20	Khaled	Ahmed	KA@gmail.com	Abha,SA	q88rftg
21	Ibrahim	Moham...	Im@gmail.com	Riyadh,SA	12334567
22	Faisal	Salman	fs@gmail.com	Qasim,SA	qawsedrftg

PURSHASER

Client_id	Billing_address
17	UAE
18	Riyadh,SA
19	Jeddah,SA
20	Abha,SA
21	Riyadh,SA
22	Qasim,SA

SUPPLIER

Client_id	Bank_account
11	1234567891
12	1234567893
13	1234567894
14	1234567890
15	1234567892
16	1234567895

CLIENT_PHONE

Client_id	Phone_number
11	544451511
12	53316651
13	53444451
14	53311111
15	53315151
15	53335151
16	533666666
17	53322222
18	53315123
18	53333351
19	53315333
20	56315151
21	54445151
22	51533151
22	53888151

ITEM

Item_id	Name	Manufac...	Used_m...	Descripti...	Starting_...	Start_date	End_date	Client_id
1	XPS 13 ...	DELL	1	Dell XPS...	5100	2008-11-...	2008-11-...	11
2	Canon Pi...	Canon	3	Canon Pi...	900	2021-12-...	2021-12-...	16
3	HP 15.6" ...	HP	5	HP 15.6" ...	2000	2020-11-...	2020-11-...	13
4	HP LaserJ...	HP	0	HP LaserJ...	750	2020-11-...	2020-11-...	12
5	Epson Ec...	Epson	4	Epson Ec...	500	2021-12-...	2021-12-...	14
6	Lenovo L...	Lenovo	0	Lenovo ...	8000	2021-12-...	2021-12-...	16
7	Brother ...	Brother	7	Brother ...	800	2011-10-...	2011-10-...	15
8	ASUS RO...	Asus	10	ASUS RO...	5000	2021-12-...	2021-12-...	12
9	Lexmark ...	Lexmark	6	Lexmark ...	6570	2021-12-...	2021-12-...	13
10	Acer Chr...	Acer	3	Acer Chr...	900	2021-12-...	2021-12-...	11
11	MSI GF75	MSI	18	2019 MS...	3650	2021-12-...	2021-12-...	15
12	Kyocera ...	Kyocera	13	Kyocera ...	2950	2013-01-...	2013-01-...	16

COMPUTER

Item_id	Storage	Speed	Memory
1	512 GB ...	1.80 GHz	16 GB DDR4
3	512 GB ...	1.70 GHz	12GB DDR4
6	1TB HDD...	2.60 GHz	16 GB DDR4
8	512 GB ...	3.3 GHz	16 GB DDR4
10	32GB eM...	1.10 GHz	4GB LPDDR4
11	512GB S...	2.60 GHz	32 GB DDR4

PRINTER

Item_id	Is_wireless	Inkjet	Is_contai...
2	True	True	False
4	True	False	False
5	True	True	True
7	True	True	True
9	False	False	False
12	False	True	True

ITEM_LANGUAGES

Item_id	Languag
1	Arabic
2	Arabic
2	English
2	France
3	English
4	English
5	English
6	English
7	Arabic
8	Arabic
9	English
10	English
11	Arabic
11	English
12	English

BID

Bid_id	Propose...	Bid_date	Item_id	Pur_id
11	6570	2021-12-10	2	17
22	550	2021-12-08	6	18
33	2060.5	2020-11-15	3	19
44	800	2020-11-19	4	20
55	5500	2021-12-10	8	21
66	3700	2021-12-25	11	22

BILLING

Bill_id	Billing_date	Bid_id
1	2021-12-30	11
2	2021-12-22	22
3	2020-11-16	33
4	2020-11-20	44
5	2021-12-28	55
6	2021-12-31	66

FEEDBACK

Client_id	Descripti...	Rating	Bill_id
17	// I bou...	2	1
18	// Love ...	5	2
19	// I bou...	3	3
20	// I bo...	5	4
21	the bad...	5	5
22	// I bou...	3	6

Query Implementation:

1.Retrieve the number of bids and the highest bid made for every item.

```
select i.Item_id, i.Name ,count(*) as Num_of_bids, MAX(Proposed_price) as highest_bid
from  (ITEM as i LEFT OUTER JOIN  BID as b on i.Item_id=b.Item_id)
group by i.Item_id ,i.Name  ;
```

	Item_id	Name	Num_of_bids	highest_bid
1	1	XPS 13 9370	1	NULL
2	2	Canon Pixma TR150	1	6570
3	3	HP 15.6" HD Micro-edge	1	2060.5
4	4	HP LaserJet Pro M404n	1	800
5	5	Epson EcoTank L3150	1	NULL
6	6	Lenovo Legion 5	1	550
7	7	Brother MFC-J497DW	1	NULL
8	8	ASUS ROG Strix G15	1	5500
9	9	Lexmark MS810DE Laser Printer	1	NULL
10	10	Acer Chromebook Spin 311 Convertible	1	NULL
11	11	MSI GF75	1	3700
12	12	Kyocera 1102S42US0 ECOSYS M2540dw	1	NULL

2. Retrieve the name of every supplier, and the number of items placed by him/her.

```
select Fname, Lname , COUNT(Item_id) AS Num_of_item
from   (SUPPLIER as s left outer join ITEM as i on i.Client_id = s.Client_id ) join
CLIENT as c on c.Client_id = s.Client_id
group by  Fname , Lname ;
```

	Fname	Lname	Num_of_item
1	Abdulrahman	Abdullah	3
2	Abdullah	Ahmed	2
3	Mohammed	Ahmed	2
4	Sauod	Ahmed	2
5	Mhmoud	Faisal	1
6	Mohammed	Saad	2

3.For each item, retrieve the number of bids, and the average price.

```
select i.Item_id, i.Name ,count(Bid_id) as Num_of_bids, avg (Proposed_price) as
Avg_price
from  (ITEM as i LEFT OUTER JOIN  BID as b on i.Item_id=b.Item_id)
group by i.Item_id ,i.Name  ;
```

Item_id	Name	Num_of_bids	Avg_price
1	XPS 13 9370	0	NULL
2	Canon Pixma TR150	1	6570
3	HP 15.6" HD Micro-edge	1	2060.5
4	HP LaserJet Pro M404n	1	800
5	Epson EcoTank L3150	0	NULL
6	Lenovo Legion 5	1	550
7	Brother MFC-J497DW	0	NULL
8	ASUS ROG Strix G15	1	5500
9	Lexmark MS810DE Laser Printer	0	NULL
10	Acer Chromebook Spin 311 Convertible	0	NULL
11	MSI GF75	1	3700
12	Kyocera 1102S42US0 ECOSYS M2540dw	0	NULL

4.Find all items' name and ID that has no bids yet.

```
SELECT Item_id, Name
FROM ITEM
WHERE Item_id NOT IN ( SELECT Item_id
                       FROM BID);
```

Item_id	Name
1	XPS 13 9370
5	Epson EcoTank L3150
7	Brother MFC-J497DW
9	Lexmark MS810DE Laser Printer
10	Acer Chromebook Spin 311 Convertible
12	Kyocera 1102S42US0 ECOSYS M2540dw

5.List all purchasers or suppliers' names who recorded a comment with 3 and above as transaction rating.

```
SELECT Fname, Lname
FROM CLIENT
WHERE Client_id IN ( SELECT Client_id
FROM FEEDBACK
                     WHERE Rating >= 3);
```

Fname	Lname
Abdulazia	Abdullah
Salman	Nayef
Khaled	Ahmed
Ibrahim	Mohammed
Faisal	Salman

6.List all purchasers' name and ID with a shipping address in Saudi Arabia.

```
SELECT        Fname, Lname, p.Client_id
FROM          PURSHASER as p JOIN CLIENT as c    on p.Client_id=c.Client_id
WHERE  Address LIKE '%,SA%' ;
```

Fname	Lname	Client_id
Abdulazia	Abdullah	18
Salman	Nayef	19
Khaled	Ahmed	20
Ibrahim	Mohammed	21
Faisal	Salman	22

7.List all suppliers' name and ID who are from Riyadh that have more than two placed items.

```
select Fname, Lname , COUNT(Item_id) AS Num_of_item
from   (SUPPLIER as s left outer join ITEM as i on i.Client_id = s.Client_id ) join
CLIENT as c on c.Client_id = s.Client_id
where Address like'%Riyadh%'
group by  Fname , Lname
having COUNT(Item_id)>2 ;
```

Fname	Lname	Num_of_item
Abdulrahman	Abdullah	3

8.List all purchasers name and ID who made more than three bids.

```
select Fname, Lname , COUNT(Bid_id) AS Num_of_bids
from   (PURSHASER as p left outer join BID on p.Client_id = Bid_id ) join CLIENT as c
on c.Client_id = p.Client_id
group by  Fname , Lname
having COUNT(bid_id)>3;
```

Fname	Lname	Num_of_bids

Note : we havent insert more than 3 bid

1. Supplier_items: this view shows the names of supplier, and the number of items they have placed.

```
create view Supplier_items
as select Fname, Lname , COUNT(*) AS Num_of_item
from   (SUPPLIER as s left outer join ITEM as i on i.Client_id = s.Client_id ) join
CLIENT as c on c.Client_id = s.Client_id
group by  Fname , Lname ;
```

KTOP-K9P7BLO.E...bo.Supplier_items

Fname	Lname	Num_of_...
Abdulrahm...	Abdullah	3
Abdullah	Ahmed	2
Mohammed	Ahmed	2
Sauod	Ahmed	2
Mhmoud	Faisal	1
Mohammed	Saad	2

2. Winner_Detailes: This view returns all of the winners' information as well as the item they won.

This view will display all the items that have bid

```
create view item_details
as SELECT *
FROM ITEM
WHERE Item_id  IN ( SELECT Item_id
  FROM BID
  );
```

Item_id	Name	Manufac...	Used_m...	Descripti...	Starting_...	Start_date	End_date	Client_id
2	Canon Pi...	Canon	3	Canon Pi...	900	2021-12-...	2021-12-...	16
3	HP 15.6" ...	HP	5	HP 15.6" ...	2000	2020-11-...	2020-11-...	13
4	HP LaserJ...	HP	0	HP LaserJ...	750	2020-11-...	2020-11-...	12
6	Lenovo L...	Lenovo	0	Lenovo ...	8000	2021-12-...	2021-12-...	16
8	ASUS RO...	Asus	10	ASUS RO...	5000	2021-12-...	2021-12-...	12
11	MSI GF75	MSI	18	2019 MS...	3650	2021-12-...	2021-12-...	15
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

This view shows item that has higher bid

```
create view higer_bid_item1
as
select b.Item_id as itemID,Pur_id, Bid_id , max(Proposed_price) As max_price
from BID b join item_details i on b.Item_id=i.Item_id
group by b.Item_id,Bid_id , Pur_id
```

itemID	Pur_id	Bid_id	max_price
2	17	11	6570
6	18	22	550
3	18	33	2060.5
4	20	44	800
8	21	55	5500
11	22	66	3700

The problem we faced is hat sql server has not natural join so we have to rename column name because name of attribute has to be unique .

```
create view Winner_details
as select *
from (higer_bid_item1 join CLIENT c on Pur_id =c.Client_id ) join item_details on
itemID=Item_id
```

Pur_id	Bid_id	max_price	Client_id	Fname	Lname	Email	Address	Password	Item_id	Name	Manufacturer_name	Used_months	Description
17	11	6570	17	Saad	Masoud	sam@gmail.com	UAE	qayrftg	2	Canon Pixma TR150	Canon	3	Canon Pixma TR150 Wireless Mobile Printer With Airprint ...
18	22	550	18	Abdulazia	Abdullah	abab@gmail.com	Riyadh,SA	qawdg	6	Lenovo Legion 5	Lenovo	0	Lenovo Legion 5, Intel Core i7-10750H, 15.6" FHD, 16 G...
18	33	2060.5	18	Abdulazia	Abdullah	abab@gmail.com	Riyadh,SA	qawdg	3	HP 15.6" HD Micro-edge	HP	5	HP 15.6" HD Micro-edge TouchScreen Laptop, Intel Core...
20	44	800	20	Khaled	Ahmed	KA@gmail.com	Abha,SA	q88rftg	4	HP LaserJet Pro M404n	HP	0	HP LaserJet Pro M404n Printer
21	55	5500	21	Ibrahim	Mohammed	Im@gmail.com	Riyadh,SA	12334567	8	ASUS ROG Strix G15	Asus	10	ASUS ROG Strix G15 (2021) Gaming Laptop, 15.6" 300...
22	66	3700	22	Faisal	Salman	fs@gmail.com	Qasim,SA	qawsedrftg	11	MSI GF75	MSI	18	2019 MSI GF75 Laptop 17.3" 120Hz FHD Gaming Comp...

BONUS

BONUS DESCRIPTION

- After the purchaser win the auction , he/she can ask to deliver the item to him by a delivery company that identified by delivery number and consist of name , price of delivery .
  - All delivery attributes cannot be null .
- Delivery company has drivers that they will the item to the customer . the Driver is identified by driver id and consist of first name , last name , is he have license and his car number .
  - All driver attributes cannot be null .
- Purchaser can ask for retrieval , Retrieval is identified by retrieval number , and consist if payment is cash or not and the reason of retrieval .
  - All retrieval attributes cannot be null.

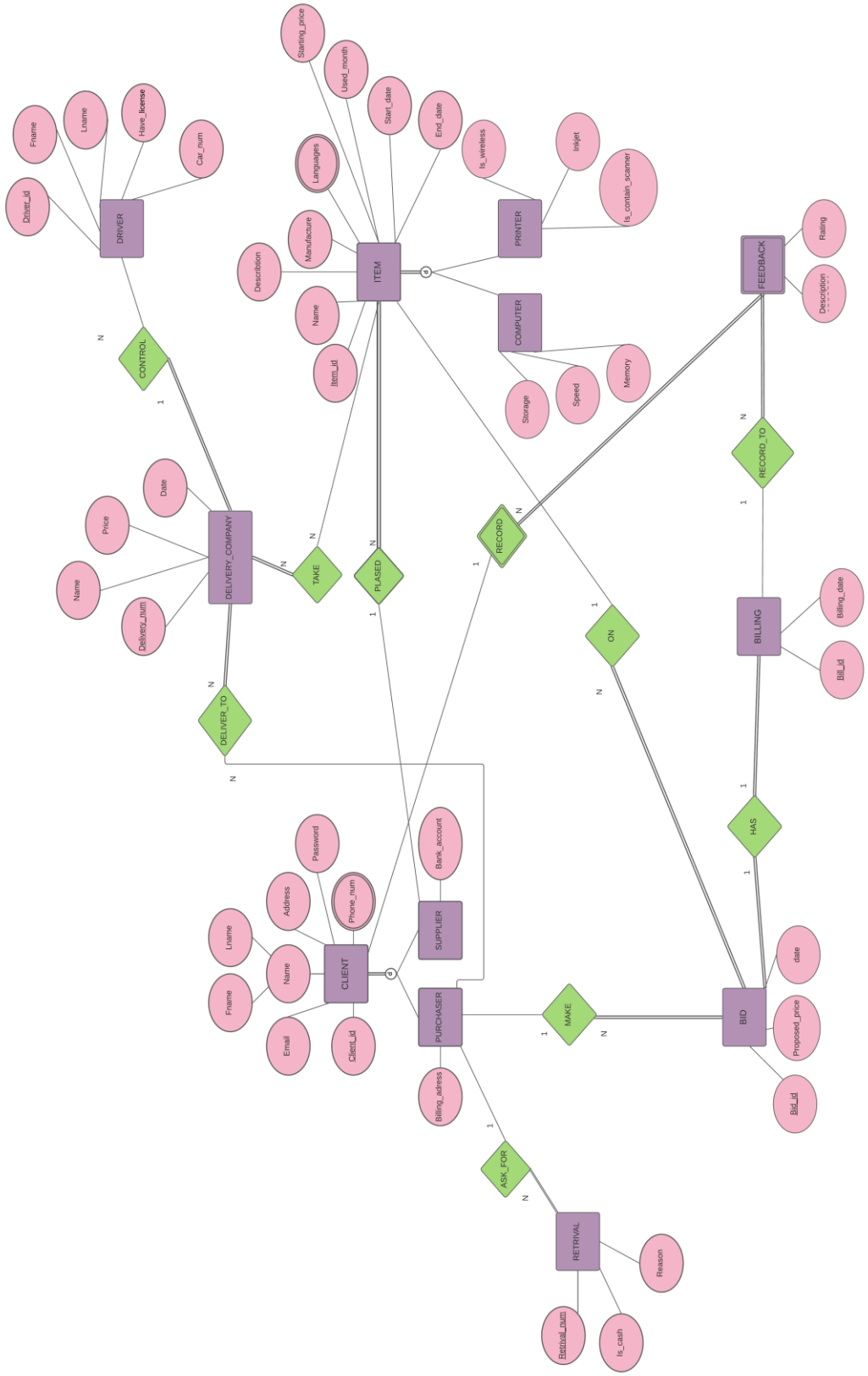
Conceptual EER Model

Description: ER Data Model component:

We are designing a database for online site which is EHARAJ it includes:

Entity	Attributes	Relationships
Delivery-company	- **Delevary-num (as PK)** - **name** - **price**	**Delivery-company take item** - **Delivery-company :total participation** - **item: partial participation** - **cardinality: many to many** **Delivery-company deliver to purchaser** - **Delivery-company :total participation** - **purchaser: partial participation** - **cardinality: many to many**
Driver	- **driver_id (as PK)** - **first name** - **last name** - **have_lience** - **car_num**	**Delivery-company control Driver** - **Delivery-company :total participation** - **Driver: partial participation** - **cardinality: one to many**
Retrieval	- **retrieval_num (as PK)** - **is_cash** - **reason**	**Purchaser ask for retrieval** - **Purchaser: partial participation** - **retrieval: total participation** - **cardinality: one to many**

Conceptual Data Model :



Relational Database Schema

Relational Database Schema :

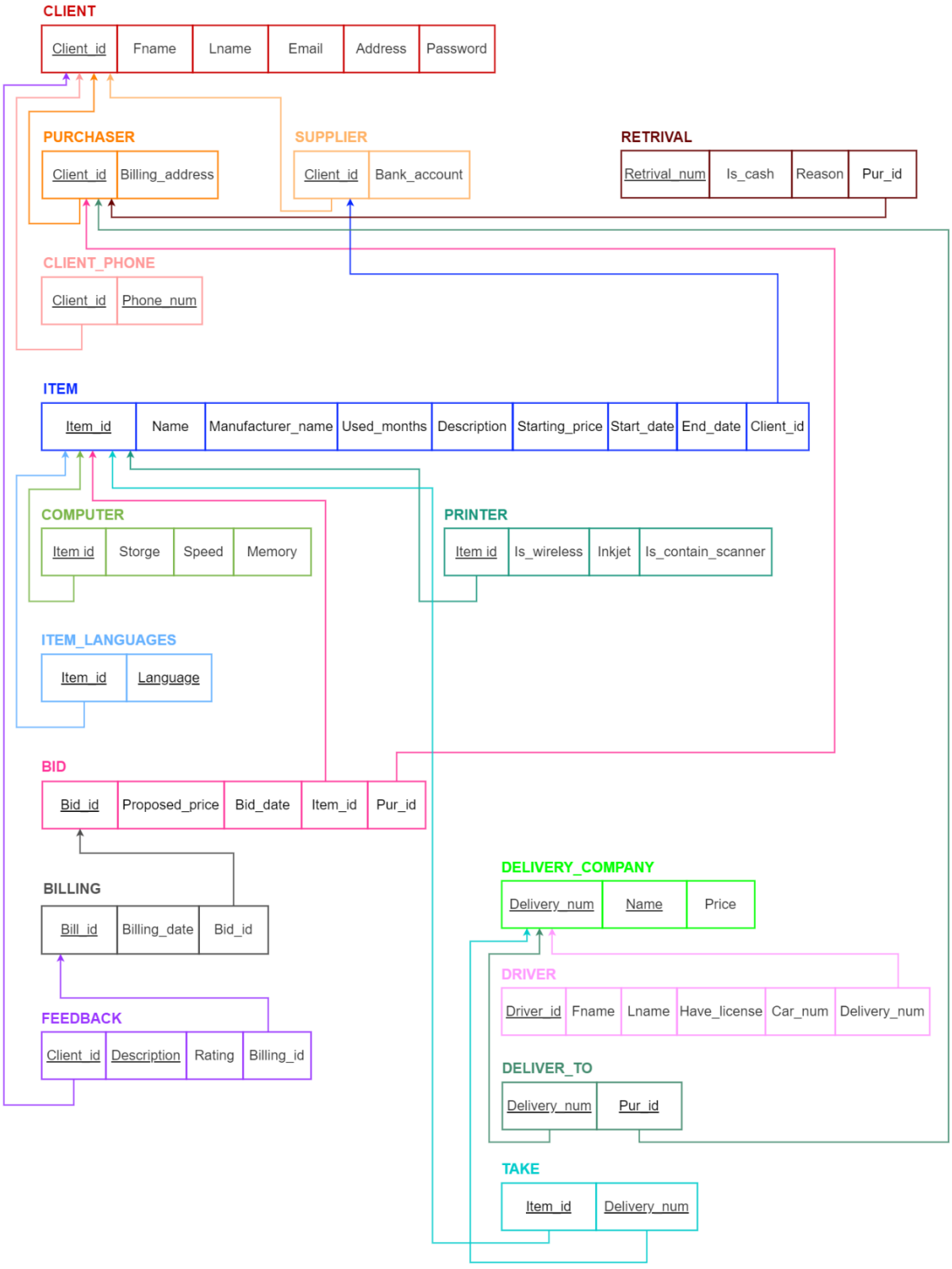


Table Creation:

```
Create table DELIVERY_COMPANY(
Delevary_num  int NOT NULL,
Name varchar(100) NOT NULL,
Price int NOT NULL,
PRIMARY KEY (Delevary_num ),

);

Create table DRIVER (
Driver_id int NOT NULL,
Fname varchar(15) NOT NULL,
Lname varchar (15) NOT NULL,
Have_license bit NOT NULL CHECK(Have_license=1),
Car_num int NOT NULL unique,
PRIMARY kEY (Driver_id ),
Delevary_num  int NOT NULL,
FOREIGN KEY (Delevary_num)REFERENCES  DELIVERY_COMPANY (Delevary_num )
On delete cascade on update cascade

);
Create table RETRIEVAL (

Retrieval_num int NOT NULL,
Is_cash bit NOT NULL,
reason varchar (1000) NOT NULL,
Pur_id int NOT NULL,
PRIMARY kEY(Retrieval_num ),
FOREIGN KEY (Pur_id)REFERENCES PURSHASER (Client_id)
On delete cascade on update cascade

);
create table TAKE (
Item_id int not null ,
Delivery_num int not null ,
primary key (Item_id,Delivery_num),
FOREIGN KEY (Item_id)REFERENCES ITEM (Item_id)
On delete cascade on update cascade ,
FOREIGN KEY (Delivery_num)REFERENCES DELIVERY_COMPANY (Delevary_num)
On delete cascade on update cascade );
create table DELIVER_TO (
Delivery_num int not null ,
Client_id int not null ,
primary key (Client_id,Delivery_num),
FOREIGN KEY (Client_id)REFERENCES PURSHASER (Client_id)
On delete cascade on update cascade ,
FOREIGN KEY (Delivery_num)REFERENCES DELIVERY_COMPANY (Delevary_num)
On delete cascade on update cascade );
```

Database State:

- ### INSERTION OF TABLE DELIVERY_COMPANY:

```
insert into DELIVERY_COMPANY
values (01, 'aramex' , 55);
insert into DELIVERY_COMPANY
values (02, 'noon' , 30);
insert into DELIVERY_COMPANY
values (03, 'Sealinks' , 99);
insert into DELIVERY_COMPANY
values (04, 'Sea Bear Shipping' , 150);
insert into DELIVERY_COMPANY
values (05, 'FlyBy' , 50);
insert into DELIVERY_COMPANY
values (06, 'Safe Shipping' , 13);
```

- ### INSERTION OF TABLE TAKE:

```
insert into TAKE
values (2, 1);
insert into TAKE
values (3, 3);
insert into TAKE
values (11, 2);
```

- ### INSERTION OF TABLE DELIVER_TO:

```
insert into DELIVER_TO
values (1, 17);
insert into DELIVER_TO
values (2, 22);
insert into DELIVER_TO
values (3, 18);
```

- ### INSERTION OF TABLE RETRIEVAL:

```
Insert into RETRIEVAL
Values (  2, 1, '  Because  product is not working  ' , 17);

Insert into RETRIEVAL
Values (  3 , 1, '  Because    The request was made wrong      ' ,22 );

Insert into RETRIEVAL
Values (  4,1 , '    Because  there is a defect in product    ' , 20);

Insert into RETRIEVAL
Values ( 5 , 1, '     Because changed my mind about the product ' ,19 );

Insert into RETRIEVAL
Values (  6 , 1, '   Because  product is not working  ' , 21);
```

- **INSERTION OF TABLE DRIVER:**

```
insert into DRIVER
values (100,'Khaled' ,'Abdullah',1,'123452',2);

insert into DRIVER
values (200,'Abdulrahman' ,'Omar',1, '123453',2);

insert into DRIVER
values (300,'Ameer' ,'Khaled',1,'123455',3);

insert into DRIVER
values (400,'Ali' ,'Mohammed',1,'123454',1);

insert into DRIVER
values (500,'Amjad' ,'Aziz',1, '123456',2);

insert into DRIVER
values (600,'Yosuf' ,'Ahmed',1, '123457',3);
```

Screenshot

DELIVERY_COMPANY

Delevary...	Name	Price
1	aramex	55
2	noon	30
3	Sealinks	99
4	Sea Bear ...	150
5	FlyBy	50
6	Safe Ship...	13

TAKE

Item_id	Delivery_...
2	1
3	3
11	2

DELIVER_TO

Delivery_...	Client_id
1	17
3	18
2	22

RETRIEVAL

Retrieval...	Is_cash	reason	Pur_id
1	True	Because r...	18
2	True	Because ...	17
3	True	Because ...	22
4	True	Because ...	20
5	True	Because...	19
6	True	Because ...	21

DRIVER

Driver_id	Fname	Lname	Have_lic...	Car_num	Delivery_...
100	Khaled	Abdullah	True	123452	2
200	Abdulrah...	Omar	True	123453	2
300	Ameer	Khaled	True	123455	3
400	Ali	Moham...	True	123454	1
500	Amjad	Aziz	True	123456	2
600	Yosuf	Ahmed	True	123457	3