Project: Coffee Shop Management System

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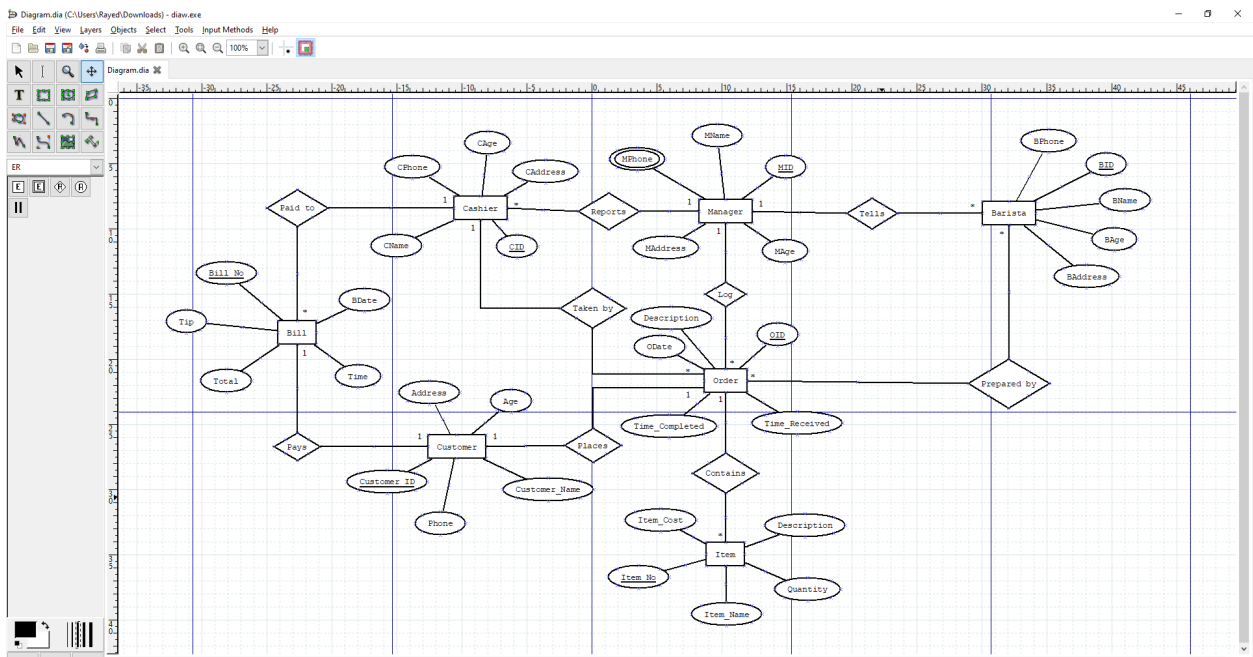
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Scenario

Coffee shop will have cashier, barista and manager as employees. They will have their individual id, name, age, phone, address. The phone number for manager will be multivalued. Customer will place order that will create a one to one relationship. Order will have id, date, description, time received and time completed as attributes. And customer will have id, name, age, phone, address as attributes. Customer will pay bill. The cardinal for this will also be one to one, because one customer will only pay one bill. Bill entity will have attributes like bill no, date, time, tip, total amount. Bill will be paid to cashier which will form many to one relation, because one cashier will take many bills. Cashier will report to manager. Order will contain items. For item entity the attributes will be item no, item name, item cost, quantity and description. Order and item will form one to many relationship. Order will be prepared by barista which will form many to many relation. Barista will tell manager that will have many to one cardinality. Lastly, manager will log orders creating a one to many relationship.

Diagram

Normalization

Paid to – (Bill_No, BDate, Time, Tip, Total, CID, CName, CPhone, CAge, CAddress)

1NF – No multivalued attribute
2NF – Bill_No, BDate, Time, Tip, Total
     Employee ID, Employee Name, Job, Phone, Age, Address
3NF – Bill_No, Tip, Total
     BNo, BDate, Time
     CID, CName, CPhone, CAge, CAddress

Final list:
1. Bill_No, Tip, Total, BNo, CID
2. BNo, BDate, Time
3. CID, CName, CPhone, CAge, CAddress

Pays – (Bill_No, BDate, Time, Tip, Total, Customer_Id, Customer_Name, Phone, Age, Address)

1NF - No multivalued attribute
2NF - Bill_No, BDate, Time, Tip, Total
     Customer_Id, Customer_Name, Phone, Age, Address
3NF - Bill_No, Tip, Total
     BNo, BDate, Time
     Customer_Id, Customer_Name, Phone, Age, Address

Final list:
1. Bill_No, Tip, Total, BNo, Customer_Id
2. BNo, BDate, Time
3. Customer_Id, Customer_Name, Phone, Age, Address

Places – (<u>Customer_Id</u>, Customer_Name, Phone, Age, Address, <u>OID</u>, Time_Received, Time_Completed, ODate, Description)

1NF - No multivalued attribute
2NF - <u>Customer_Id</u>, Customer_Name, Phone, Age, Address
      <u>OID</u>, Time_Received, Time_Completed, ODate, Description
3NF - <u>Customer_Id</u>, Customer_Name, Phone, Age, Address
      <u>OID</u>, ODate, Description
      <u>TNo</u>, Time_Received, Time_Completed

Final list:
1. <u>Customer_Id</u>, Customer_Name, Phone, Age, Address, OID
2. <u>OID</u>, ODate, Description, TNo
3. <u>TNo</u>, Time_Received, Time_Completed

Taken by – (<u>OID</u>, Time_Received, Time_Completed, ODate, Description, <u>CID</u>, CName, CPhone, CAge, CAddress)

1NF - No multivalued attribute
2NF - <u>OID</u>, Time_Received, Time_Completed, ODate, Description
      <u>CID</u>, CName, CPhone, CAge, CAddress
3NF - <u>OID</u>, ODate, Description
      <u>TNo</u>, Time_Received, Time_Completed
      <u>CID</u>, CName, CPhone, CAge, CAddress

Final list:
1. <u>OID</u>, ODate, Description, TNo, CID
2. <u>TNo</u>, Time_Received, Time_Completed
3. <u>CID</u>, CName, CPhone, CAge, CAddress

Contains – (OID, Time_Received, Time_Completed, ODate, Description, Item_No, Item_Name, Item_Cost, Quantity, Description)

1NF - No multivalued attribute
2NF - OID, Time_Received, Time_Completed, ODate, Description
     Item_No, Item_Name, Item_Cost, Quantity, Description
3NF - OID, ODate, Description
     TNo, Time_Received, Time_Completed
     Item_No, Item_Name, Item_Cost, Quantity, Description

Final list:
1. OID, ODate, Description, TNo
2. TNo, Time_Received, Time_Completed
3. Item_No, Item_Name, Item_Cost, Quantity, Description, OID

Prepared by – (OID, Time_Received, Time_Completed, ODate, Description, BID, BName, BPhone, BAge, BAddress)

1NF – No multivalued attribute
2NF - OID, Time_Received, Time_Completed, ODate, Description
     BID, BName, BPhone, BAge, BAddress
3NF - OID, ODate, Description
     TNo, Time_Received, Time_Completed
     BID, BName, BPhone, BAge, BAddress

Final list:
1. OID, ODate, Description, TNo
2. TNo, Time_Received, Time_Completed
3. BID, BName, BPhone, BAge, BAddress
4. PNO, OID, BID

Tells – (BID, BName, BPhone, BAge, BAddress, MID, MName, MPhone, MAge, MAddress)

1NF – MPhone is a multivalued attribute
2NF - BID, BName, BPhone, BAge, BAddress
         MID, MName, MPhone, MAge, MAddress
3NF – No transitive dependency
         BID, BName, BPhone, BAge, BAddress
         MID, MName, MPhone, MAge, MAddress

Final list:
    1. BID, BName, BPhone, BAge, BAddress, MID
    2. MID, MName, MAge, MAddress
    3. MID, MPhone - Composite primary key

Reports – (CID, CName, CPhone, CAge, CAddress, MID, MName, MPhone, MAge, MAddress)

1NF - MPhone is a multivalued attribute
2NF - CID, CName, CPhone, CAge, CAddress
         MID, MName, MPhone, MAge, MAddress
3NF - No transitive dependency
         CID, CName, CPhone, CAge, CAddress
         MID, MName, MPhone, MAge, MAddress

Final list:
    1. CID, CName, CPhone, CAge, CAddress, MID
    2. MID, MName, MAge, MAddress
    3. MID, MPhone - Composite primary key

Log – (MID, MName, MPhone, MAge, MAddress, OID, Time_Received, Time_Completed, ODate, Description)

1NF - MPhone is a multivalued attribute
2NF - MID, MName, MPhone, MAge, MAddress
         OID, Time_Received, Time_Completed, ODate, Description
3NF - MID, MName, MPhone, MAge, MAddress
        OID, ODate, Description
        TNo, Time_Received, Time_Completed

Final list:
   1. MID, MName, MAge, MAddress
   2. MID, MPhone - Composite primary key
   3. OID, ODate, Description, TNo, MID
   4. TNo, Time_Received, Time_Completed

Final list from normalization:

1. <u>BNo</u>, BDate, Time -> TIME-----------
2. <u>PNO</u>, OID, BID -> PREPARE----------
3. <u>MID</u>, MName, MAge, MAddress -> MANAGER-----------
4. <u>OID</u>, ODate, Description, TNo, CID, MID -> ORDERS---------
5. <u>Bill_No</u>, Tip, Total, BNo, CID, Customer_Id -> BILL----------
6. <u>MID</u>, <u>MPhone</u> - Composite primary key -> CONTACT----------
7. <u>TNo</u>, Time_Received, Time_Completed -> DURATION----------
8. <u>CID</u>, CName, CPhone, CAge, CAddress, MID -> CASHIER--------
9. <u>BID</u>, BName, BPhone, BAge, BAddress, MID -> BARISTA--------
10. <u>Item_No</u>, Item_Name, Item_Cost, Quantity, Description, OID -> ITEM------
11. <u>Customer_Id</u>, Customer_Name, Phone, Age, Address, OID -> CUSTOMER------

Table Creation

Time

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
TIME	BNO	Number	-	4	0	1	-	-	-
	BDATE	Date	7	-	-	-	✓	-	-
	TIME	Varchar2	8	-	-	-	✓	-	-
									1 - 3

Manager

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
MANAGER	MID	Number	-	4	0	1	-	-	-
	MNAME	Varchar2	25	-	-	-	✓	-	-
	MAGE	Number	-	3	0	-	✓	-	-
	MADDRESS	Varchar2	30	-	-	-	✓	-	-
									1 - 4

Contact

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CONTACT	MID	Number	-	4	0	1	-	-	-
	MPHONE	Varchar2	11	-	-	2	-	-	-
									1 - 2

Duration

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DURATION	TNO	Number	-	4	0	1	-	-	-
	TIME_RECEIVED	Varchar2	8	-	-	-	✓	-	-
	TIME_COMPLETED	Varchar2	8	-	-	-	✓	-	-
									1 - 3

Cashier

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CASHIER	CID	Number	-	4	0	1	-	-	-
	CNAME	Varchar2	25	-	-	-	✓	-	-
	CPHONE	Varchar2	11	-	-	-	✓	-	-
	CAGE	Number	-	3	0	-	✓	-	-
	CADDRESS	Varchar2	30	-	-	-	✓	-	-
	MID	Number	-	4	0	-	✓	-	-
									1 - 6

Barista

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BARISTA	BID	Number	-	4	0	1	-	-	-
	BNAME	Varchar2	25	-	-	-	✔	-	-
	BPHONE	Varchar2	11	-	-	-	✔	-	-
	BAGE	Number	-	3	0	-	✔	-	-
	BADDRESS	Varchar2	30	-	-	-	✔	-	-
	MID	Number	-	4	0	-	✔	-	-
									1 - 6

Orders

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ORDERS	OID	Number	-	4	0	1	-	-	-
	ODATE	Date	7	-	-	-	✔	-	-
	DESCRIPTION	Varchar2	50	-	-	-	✔	-	-
	TNO	Number	-	4	0	-	✔	-	-
	CID	Number	-	4	0	-	✔	-	-
	MID	Number	-	4	0	-	✔	-	-
									1 - 6

Prepare

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PREPARE	PNO	Number	-	4	0	1	-	-	-
	OID	Number	-	4	0	-	✔	-	-
	BID	Number	-	4	0	-	✔	-	-
									1 - 3

Item

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ITEM	ITEM_NO	Number	-	4	0	1	-	-	-
	ITEM_NAME	Varchar2	25	-	-	-	✔	-	-
	ITEM_COST	Number	-	4	0	-	✔	-	-
	QUANTITY	Number	-	3	0	-	✔	-	-
	DESCRIPTION	Varchar2	50	-	-	-	✔	-	-
	OID	Number	-	4	0	-	✔	-	-
									1 - 6

Customer

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMER	CUSTOMER_ID	Number	-	4	0	1	-	-	-
	CUSTOMER_NAME	Varchar2	25	-	-	-	✓	-	-
	PHONE	Varchar2	11	-	-	-	✓	-	-
	AGE	Number	-	3	0	-	✓	-	-
	ADDRESS	Varchar2	30	-	-	-	✓	-	-
	OID	Number	-	4	0	-	✓	-	-
									1 - 6

Bill

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BILL	BILL_NO	Number	-	4	0	1	-	-	-
	TIP	Number	-	4	0	-	✓	-	-
	TOTAL	Number	-	4	0	-	✓	-	-
	BNO	Number	-	4	0	-	✓	-	-
	CID	Number	-	4	0	-	✓	-	-
	CUSTOMER_ID	Number	-	4	0	-	✓	-	-
									1 - 6

Foreign Key

Cashier

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	CA1X	P	CASHIER	-	-	-	-
SCOTT	FCA1X	R	CASHIER	-	SCOTT	M1X	NO AC

Barista

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	B1X	P	BARISTA	-	-	-	-
SCOTT	FB1X	R	BARISTA	-	SCOTT	M1X	NO AC

Orders

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	O1X	P	ORDERS	-	-	-	-
SCOTT	FO1X	R	ORDERS	-	SCOTT	D1X	NO AC
SCOTT	FO2X	R	ORDERS	-	SCOTT	CA1X	NO AC
SCOTT	FO3X	R	ORDERS	-	SCOTT	M1X	NO AC

Prepare

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	PR1X	P	PREPARE	-	-	-	-
SCOTT	FPR1X	R	PREPARE	-	SCOTT	O1X	NO AC
SCOTT	FPR2X	R	PREPARE	-	SCOTT	B1X	NO AC

Item

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	I1X	P	ITEM	-	-	-	-
SCOTT	FI1X	R	ITEM	-	SCOTT	O1X	NO AC

Customer

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	CU1X	P	CUSTOMER	-	-	-	-
SCOTT	FCU1X	R	CUSTOMER	-	SCOTT	O1X	NO AC

Bill

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELE
SCOTT	BI1X	P	BILL	-	-	-	-
SCOTT	FBI1X	R	BILL	-	SCOTT	T1X	NO AC
SCOTT	FBI2X	R	BILL	-	SCOTT	CA1X	NO AC
SCOTT	FBI3X	R	BILL	-	SCOTT	CU1X	NO AC

Value Insertion

Time

BNO	BDATE	TIME
101	02-FEB-21	3:00 PM
102	02-FEB-21	4:45 PM
103	03-FEB-21	4:13 PM
104	04-FEB-21	5:58 PM
105	05-FEB-21	7:49 PM

Manager

MID	MNAME	MAGE	MADDRESS
201	Rifat	27	kha-78/1/F, Dhaka-1229
202	Abdullah	24	Ra-26/3/A, Dhaka-1227
203	Shamim	22	ka-39/7/F, Dhaka-1225
204	Risala	25	ha-17/9/F, Dhaka-1223
205	Taskin	29	fa-81/4/F, Dhaka-1228

Contact

MID	MPHONE
301	01738562973
302	01583623987

Duration

TNO	TIME_RECEIVED	TIME_COMPLETED
401	2:20 PM	2:27 PM
402	4:14 PM	4:19 PM
403	3:34 PM	3:42 PM
404	5:20 PM	5:31 PM
405	7:06 PM	7:15 PM

Cashier

CID	CNAME	CPHONE	CAGE	CADDRESS	MID
501	Rafin	01839205387	21	pa-67/2/G, Dhaka-1223	201
502	RABBI	01846458392	23	cha-28/4/k, Dhaka-1229	202
503	Arafat	01938475893	22	no-65/6/l, Dhaka-1226	203
504	Niloy	01765839487	24	vha-98/1/q, Dhaka-1221	204
505	Abir	01856478937	26	la-66/n, Dhaka-1224	205

Barista

BID	BNAME	BPHONE	BAGE	BADDRESS	MID
601	rifat	01684658992	21	ka-44/3/h, Dhaka-1229	201
602	Fariha	01848758649	21	cha-22/1/o, Dhaka-1229	202
603	Farid	01648593678	23	la-27/4/i, Dhaka-1224	203
604	Ornob	01583748938	27	fa-89/7/u, Dhaka-1225	204
605	Gohin	01463897684	22	no-49/8/y, Dhaka-1223	205

Orders

OID	ODATE	DESCRIPTION	TNO	CID	MID
701	02-FEB-21	-	401	501	201
702	02-FEB-21	-	402	502	202
703	03-FEB-21	-	403	503	203
704	04-FEB-21	-	404	504	204
705	05-FEB-21	-	405	505	205

Prepare

PNO	OID	BID
801	701	601
802	702	602
803	703	603
804	704	604
805	705	605

Item

ITEM_NO	ITEM_NAME	ITEM_COST	QUANTITY	DESCRIPTION	OID
901	Latte	150	2	-	701
902	Cappuccino	170	1	-	702
903	Espresso	130	3	-	703
904	Mocha	180	2	-	704
905	Frappuccino	200	1	-	705

Customer

CUSTOMER_ID	CUSTOMER_NAME	PHONE	AGE	ADDRESS	OID
111	Rabbi	01984675832	19	la-56/1/G, Dhaka-1228	701
112	Farhan	01875684389	22	cha-28/4/a, Dhaka-1222	702
113	Anas	01684736598	32	fa-89/5/s, Dhaka-1224	703
114	Safid	01458762987	28	ha-57/2/d, Dhaka-1225	704
115	Abrar	01748567381	45	do-49/8/f, Dhaka-1221	705

Bill

BILL_NO	TIP	TOTAL	BNO	CID	CUSTOMER_ID
121	10	310	101	501	111
122	20	190	102	502	112
123	10	400	103	503	113
124	30	390	104	504	114
125	20	220	105	505	115

Questions

1. Write a query that will display the name and phone number of cashiers who has the digit 8 as the third number of their phone number.
2. Write a query that will display the name and position of 'a' in name of barista.
3. Write a query that will display the difference between the highest and lowest age of manager. Label the column DIFFERENCE.
4. Find the average of age of customers who are above 20. Show in integer form.
5. Display the name of cashier along with their manager's name.
6. Find the name and age of smallest cashier.
7. Find the cheapest item that has the most quantity.
8. Find the bill no with highest tip.
9. Create a read only view based on the customer id, customer name and age.
10. Write a query that will display the name of item which costs 130, 150, 170 respectively. Ascend them by cost.

Constraints

Making phone number in table Barista unique:

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTR
SCOTT	B1X	P	BARISTA	-	-	-
SCOTT	FB1X	R	BARISTA	-	SCOTT	M1X
SCOTT	UB1X	U	BARISTA	-	-	-

insert into barista values(606, 'Test', '01463897684', 65, null, null)

For this query we get:

```
ORA-00001: unique constraint (SCOTT.UB1X) violated
```

Unique constraint violated

Making tip in table Bill default as 0:

insert into bill(bill_no, Total) values(126, 999)

For this query we get,

BILL_NO	TIP	TOTAL	BNO	CID	CUSTOMER_ID
121	10	310	101	501	111
122	20	190	102	502	112
123	10	400	103	503	113
124	30	390	104	504	114
125	20	220	105	505	115
126	0	999	-	-	-