Coffee Ordering System

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1-Project Description

This database system is designed to manage and track various aspects of operations in a chain coffee restaurant, such as “Coffy,” located on our campus. A coffee shop chain, specifically focusing on customer orders, menu items, payment processing, reviews, and inventory management. The main goal is building a strong database system that facilitates effective access to data and relationships amongst 10 distinct entities, which are **Customer**, **Coffee Shop**, **Menu**, **Coffee Item**, **Order**, **Payment**, **Review**, **Bartender**, **Promotion**, and **Inventory**.

1. **Customer**: Represents the individuals who place orders at the coffee shops. Each customer is uniquely identified by a **CustomerID** and has attributes such as **Name**, **Email**, and **Phone**. Customers can place multiple **Orders** and can leave multiple **Reviews** for different coffee shops.
2. **Coffee Shop**:Symbolizes the various coffee shops in the chain. Each shop has a unique identifier called **ShopID** and attributes including **Name**, **Location**, and **Phone**. There’s a One-to-Many relationship with the **Order** entity, as each coffee shop can process multiple orders, but every order must be linked to a coffee shop. The **Coffee Shop** can also receive multiple **Reviews**, employ multiple **Bartenders**, offer multiple **Promotions**, and manage multiple **Inventory** records.
3. **Menu**:Includes the unique menus that each coffee shop offers. Each menu is uniquely identified by a **MenuID** and belongs to a specific coffee shop through **ShopID** as a foreign key. The **Menu** has a **MenuName** attribute and is related to multiple **Coffee Items**.
4. **Coffee Item**: Give a brief description of each coffee or drink option on the menus. Each coffee item has a unique identifier called **CoffeeID** and attributes such as **MenuID**, **CoffeeName**, **Price**, **Size**, and **Add-Ons**. There’s a Many-to-Many relationship between **Coffee Item** and **Order**, indicating that an order can include multiple coffee items, and each coffee item can be part of multiple orders.
5. **Order**: Tracks details of customer orders, identified by an **OrderID**. Attributes include **CustomerID** (linking to the customer), **ShopID** (linking to the coffee shop), **OrderDate**, and **TotalAmount**. An order can include multiple **Coffee Items** .
6. **Payment**: Manages payment information for orders, with each payment identified by a **PaymentID**. Attributes include **OrderID** (linking to the order), **PaymentType**, **PaymentStatus**, and **Amount**. Each payment corresponds to a single order.
7. **Review**: Allows customers to leave feedback and rate their experience. Each review has a unique identifier called **ReviewID** and includes **CustomerID** (linking to the customer), **ShopID** (linking to the coffee shop), **Rating**, and **Comment**. Each review is associated with a single customer and a single coffee shop.
8. **Bartender**: Represents the staff who prepare and serve coffee and other beverages. Each bartender is identified by a **BartenderID** and is linked to a specific coffee shop through **ShopID**. Bartenders are essential for the operation of each coffee shop, and their details are recorded in the system.

9. **Promotion**: Represents special offers or discounts available at the coffee shops. Each promotion has a unique identifier called **PromotionID**, along with attributes like **Description**, **StartDate**, **EndDate**, and **DiscountAmount**. Promotions are linked to specific coffee shops, allowing customers to take advantage of special deals.
10. **Inventory**: Manages the stock of coffee items and ingredients available in each coffee shop. Each inventory record is identified by an **InventoryID** and includes attributes such as **ShopID** (linking to the coffee shop), **ItemName**, **Quantity**, and **ReorderLevel**. The inventory system ensures that coffee shops maintain adequate stock levels for their operations.

Relationships

Customer-Order

One-to-Many relationship. A customer can place multiple orders, but each order is placed by a single customer. Since every instance of an “order” entity participates in the relation "makes", there is a participation constraint.

Coffee Shop-Order

One-to-Many relationship. A coffee shop can prepare multiple orders, but every order is associated with a single coffee shop. Since every instance of an “order” entity participates in the relation “prepare”, there is a participation constraint.

Menu-Coffee Item

Many-to-many relationship, a Menu can contain multiple **CoffeeItems**, and a **CoffeeItem** can appear on multiple Menus. This allows a coffee shop to reuse the same coffee items across different menus, such as daily specials or limited-time offers, without duplicating the item for each menu.

Order-Coffee Item

Many-to-Many relationship. An order can include multiple coffee items, and each coffee item can be included in multiple orders. Since every instance of an “order” entity participates in the relation “includes”, there is a participation constraint.

Payment-Order

One-to-One relationship. Each payment corresponds to one order, and each order can have one payment record. Because every instance of the entity “order” has the relation of “requires” with “payment” and every instance of the entity “payment” has the relation of “requires” with “order”, There is a participation constraint.

Customer-Review

One-to-Many relationship. A customer can leave multiple reviews, but each review is written by one customer. Since every instance of a “review” entity participates in the relation “leaves”, there is a participation constraint.

Coffee Shop-Review

One-to-Many relationship. A coffee shop can receive multiple reviews, but each review is for one coffee shop. Since every review is participating in the relation “receives”, there is a participation constraint.

Coffee Shop-Bartender

One-to-Many relationship. A coffee shop can have multiple bartenders, but each bartender works at one coffee shop. Since every bartender is participating in the relation “employs”, there is a participation constraint.

Coffee Shop-Promotion

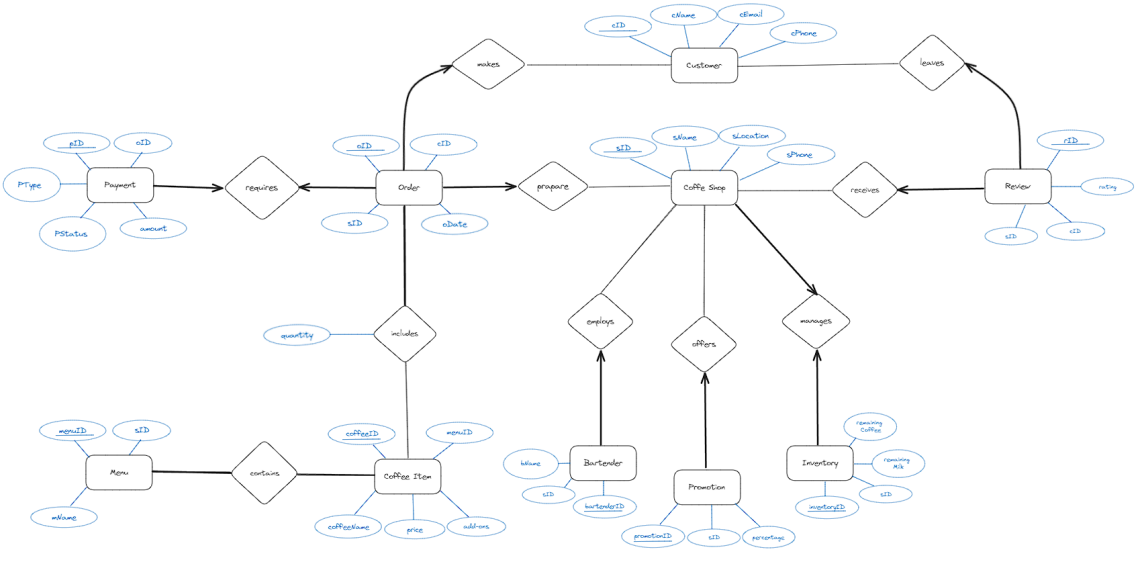
One-to-Many relationship. A coffee shop can have multiple promotions, but each promotion is associated with one coffee shop. Since every promotion is participating in the relation “offers”, there is a participation constraint.

Coffee Shop-Inventory

One-to-One relationship. Each coffee shop manages a single inventory, and each inventory is associated with only one coffee shop. This ensures that every coffee shop has a unique inventory system dedicated exclusively to it, with no sharing of inventories between multiple coffee shops.

2- ER Diagram

https://excalidraw.com/#room=20d364bfadd9d15250d9,ls6MxTLTFR0TMxMAFY



3- Relational Model

```
CREATE TABLE CUSTOMER (
   cID INT,
   cName VARCHAR(200),
   cEmail VARCHAR(200),
   cPhone VARCHAR(200),
   PRIMARY KEY (cID)
);

CREATE TABLE COFFESHOP (
   sID INT,
   sName VARCHAR(200),
   sLocation VARCHAR(200),
   sPhone VARCHAR(200),
   average_review DECIMAL(3, 2) DEFAULT NULL,
   PRIMARY KEY (sID)
);

CREATE TABLE MENU (
   menuID INT,
   sID INT,
   mName VARCHAR(200),
   PRIMARY KEY (menuID),
   FOREIGN KEY (sID) REFERENCES COFFESHOP(sID) ON DELETE CASCADE
);

CREATE TABLE ORDERS (
   oID INT,
   sID INT,
   cID INT,
   oDate DATE,
   PRIMARY KEY (oID),
   FOREIGN KEY (sID) REFERENCES COFFESHOP(sID) ON DELETE CASCADE,
   FOREIGN KEY (cID) REFERENCES CUSTOMER(cID) ON DELETE CASCADE
);

CREATE TABLE PAYMENT (
   amount INT,
   pID INT,
   oID INT,
   PType VARCHAR(200),
   PStatus BOOLEAN,
   PRIMARY KEY (pID),
```

```
    FOREIGN KEY (oID) REFERENCES ORDERS(oID) ON DELETE CASCADE
);
CREATE TABLE COFFEEITEMS (
    coffeeID INT,
    menuID INT,
    coffeeName VARCHAR(200),
    price INT,
    addOn VARCHAR(200),
    PRIMARY KEY (coffeeID),
    FOREIGN KEY (menuID) REFERENCES MENU(menuID) ON DELETE CASCADE
);

CREATE TABLE REVIEW (
    rID INT,
    sID INT,
    cID INT,
    rating FLOAT,
    PRIMARY KEY ( rID ),
    FOREIGN KEY ( sID ) REFERENCES COFFESHOP( sID ) ON DELETE CASCADE,
    FOREIGN KEY ( cID ) REFERENCES CUSTOMER( cID ) ON DELETE CASCADE
);

CREATE TABLE BARTENDER (
     bID INT,
    sID INT,
    bName VARCHAR ( 200 ),
    PRIMARY KEY ( bID ),
    FOREIGN KEY ( sID ) REFERENCES COFFESHOP( sID ) ON DELETE CASCADE
);

CREATE TABLE PROMOTION (
    promotionID INT,
    percentage INT,
    sID INT,
    PRIMARY KEY (promotionID),
    FOREIGN KEY (sID) REFERENCES COFFESHOP(sID) ON DELETE CASCADE
);

CREATE TABLE INVENTORY (
    inventoryID INT,
    remainingMilk INT,
    remainingCoffee INT,
    sID INT,
    PRIMARY KEY (inventoryID),
```

```
    FOREIGN KEY (sID) REFERENCES COFFESHOP(sID) ON DELETE CASCADE
);


CREATE TABLE MenuCoffeeItem (
    menuID INT,
    coffeeID INT,
    FOREIGN KEY (menuID) REFERENCES MENU(menuID) ON DELETE CASCADE,
    FOREIGN KEY (coffeeID) REFERENCES COFFEEITEMS(coffeeID) ON DELETE
CASCADE
);

CREATE TABLE OrderCoffeeItem (
    oID INT,
    coffeeID INT,
    quantity INT,
    FOREIGN KEY (oID) REFERENCES ORDERS(oID) ON DELETE CASCADE,
    FOREIGN KEY (coffeeID) REFERENCES COFFEEITEMS(coffeeID) ON DELETE
CASCADE
);









INSERT INTO CUSTOMER (cID, cName, cEmail, cPhone) VALUES
    (1, 'Bahar Abit', 'bahar.abit@sabanci.com', '555-1001'),
    (2, 'Ayşe Efdal', 'ayse.efdal@sabanci.com', '555-1002'),
    (3, 'Erdem Emre', 'erdem.emre@sabanci.com', '555-1003'),
    (4, 'Kaan Usta', 'kaan.usta@sabanci.com', '555-1004'),
    (5, 'Umut Kerem', 'umut.kerem@sabanci.com', '555-1005'),
    (6, 'Zengin Hüseyin', 'zengin.huseyin@sabanci.com', '555-1006'),
    (7, 'Eren Yıldız', 'eren.yildiz@sabanci.com', '555-1007'),
    (8, 'Ali Veli', 'ali.veli@sabanci.com', '555-1008'),
    (9, 'Cem Özdemir', 'cem.ozdemir@sabanci.com', '555-1009'),
    (10, 'Merve Yılmaz', 'merve.yilmaz@sabanci.com', '555-1010');



INSERT INTO COFFESHOP (sID, sName, sLocation, sPhone,  average_review) VALUES
    (1, 'Kahve Dünyası', 'İstanbul, Kadıköy', '555-2001', 4.03),
```

```
    (2, 'Starbucks', 'İstanbul, Beşiktaş', '555-2002', 4.99),
    (3, 'Punto', 'İstanbul, Nişantaşı', '555-2003', 1.31),
    (4, 'MOC', 'İstanbul, Taksim', '555-2004', 2.36),
    (5, 'Kahve Durağı', 'Ankara, Çankaya', '555-2005', 3.65),
    (6, 'Cafe Nero', 'İzmir, Alsancak', '555-2006', 4.56),
    (7, 'V60 Coffee', 'Bursa, Osmangazi', '555-2007', 2.43),
    (8, 'Cafe Gusto', 'Antalya, Kaleiçi', '555-2008', 3.76),
    (9, 'Kahve Molası', 'Konya, Selçuklu', '555-2009', 2.69),
    (10, 'Çaycı', 'Trabzon, Ortahisar', '555-2010', 1.70);

INSERT INTO MENU (menuID, sID, mName) VALUES
    (1, 1, 'Sabancı Menüsü'),
    (2, 1, 'Sabah Kahve Menüsü'),
    (3, 1, 'Sonbahar Akşam Menüsü'),
    (4, 2, 'Türk Lezzetleri Menüsü'),
    (5, 2, 'Kadıköy Menüsü'),
    (6, 3, 'Sıcak Kahve Menüsü'),
    (7, 3, 'Soğuk Kahve Menüsü'),
    (8, 4, 'Öğlen Keyfi Menüsü'),
    (9, 5, 'Tatlı Saatleri Menüsü'),
    (10, 6, 'Basic Kahve Menüsü');



INSERT INTO ORDERS (oID, sID, cID, oDate) VALUES
(12456, 1, 5,  '2024-10-14'),
(12457, 1, 8, '2024-10-15'),
(12458, 2, 8,  '2024-10-8'),
(12459, 2, 4, '2024-10-14'),
(12460, 3, 3, '2024-10-10'),
(12461, 4, 2, '2024-10-11'),
(12462, 5, 6, '2024-10-09'),
(12463, 6, 9, '2024-10-13'),
(12464, 7, 1, '2024-10-12'),
(12465, 8, 10, '2024-10-14');



INSERT INTO PAYMENT (amount, pID, oID, PType, PStatus) VALUES
                    (100, 1, 12456, 'Kredi Kartı', 1),
                    (250, 2, 12457, 'Nakit', 0),
                    (500, 3,  12458,  'Havale', 1),
(150, 4,  12456, 'Kredi Kartı', 1),
                    (300, 5,  12457, 'Nakit', 0),
(300, 6,  12459, 'Havale', 1),
```

(200, 7, 12462, 'Kredi Kartı', 1),
(150, 8, 12463, 'Nakit', 0),
(180, 9, 12464, 'Havale', 1),
(300, 10, 12465, 'Kredi Kartı', 1);

INSERT INTO REVIEW (rID, sID, cID, rating) VALUES
(1, 1, 1, 4.5),
(2, 2, 2, 5.0),
(3, 3, 3, 3.7),
(4, 1, 4, 2.8),
(5, 4, 5, 4.2),
(6, 2, 6, 3.0),
(7, 5, 7, 4.9),
(8, 3, 8, 1.5),
(9, 6, 9, 4.1),
(10, 7, 10, 3.1);

INSERT INTO BARTENDER (bID , sID , bName) VALUES

(1, 1, 'Esther Berghmans'),
(2, 1, 'Ege Tan'),
(3, 2, 'Barış Alper'),
(4, 2, 'Kaan Ayhan'),
(5, 3, 'Fetih Kerim'),
(6, 4, 'Enes Kaan'),
(7, 5, 'Bora Alsancak'),
(8, 5, 'Açılay Tan'),
(9, 6, 'Çağatay Koçtuğ'),
(10, 7, 'Serdar Usta');

INSERT INTO COFFEEITEMS (coffeeID, menuID, coffeeName, price, addOn) VALUES
(1,1, "Turkish Coffee", 80, "Sugar"),
(2,1, "Americano", 100, "Irish Pump"),
(3,1, "Açai Latte", 120, "No"),
(4,2, "Latte", 90, "Toffee Nut"),
(5,2, "Cappuccino", 90, "Cinnamon"),
(6,3, "Macchiato", 80, "No"),
(7,3, "Kakao", 70, "Milk"),

```
    (8,4, "Flat White", 90, "No"),
    (9, 4, 'Mocha', 95, 'Whipped Cream'),
    (10, 5, 'Frappuccino', 110, 'Chocolate Drizzle');


INSERT INTO PROMOTION (promotionID, percentage, sID) VALUES
    (1, 20, 1),
    (2, 50, 2),
    (3, 25, 3),
    (4, 40, 2),
    (5, 60, 4),
    (6, 10, 5),
    (7, 15, 6),
    (8, 20, 5),
    (9, 14, 7),
    (10, 30, 8);


INSERT INTO INVENTORY (inventoryID, remainingMilk, remainingCoffee, sID) VALUES
    (1, 500, 1000, 1),
    (2, 600, 1100, 2),
    (3, 450, 900, 3),
    (4, 300, 700, 4),
    (5, 400, 800, 5),
    (6, 550, 1200, 6),
    (7, 500, 950, 7),
    (8, 350, 700, 8),
    (9, 300, 600, 9),
    (10, 250, 500, 10);


INSERT INTO MenuCoffeeItem (menuID, coffeeID) VALUES

    (1, 1),
    (2, 1),
    (2, 2),
    (3, 3),
```

```
    (3, 4),
    (4, 4),
    (5, 5),
    (6, 6),
    (4, 7),
    (7, 8);


INSERT INTO OrderCoffeeItem (oID, coffeeID, quantity) VALUES

    (12456, 1, 2),
    (12457, 2, 3),
    (12458, 2, 1),
    (12458, 3, 5),
    (12459, 3, 4),
    (12459, 4, 2),
    (12460, 5, 3),
    (12461, 5, 3),
    (12461, 6, 1),
    (12461, 5, 2);

SELECT * FROM COFFESHOP;
```

TABLES

CUSTOMERS:

cID	cName	cEmail	cPhone
1	Bahar Abit	bahar.abit@sabanci.com	555-1001
2	Ayşe Efdal	ayse.efdal@sabanci.com	555-1002
3	Erdem Emre	erdem.emre@sabanci.com	555-1003
4	Kaan Usta	kaan.usta@sabanci.com	555-1004
5	Umut Kerem	umut.kerem@sabanci.com	555-1005
6	Zengin Hüseyin	zengin.huseyin@sabanci.com	555-1006
7	Eren Yıldız	eren.yildiz@sabanci.com	555-1007
8	Ali Veli	ali.veli@sabanci.com	555-1008
9	Cem Özdemir	cem.ozdemir@sabanci.com	555-1009
10	Merve Yılmaz	merve.yilmaz@sabanci.com	555-1010
NULL	NULL	NULL	NULL

COFFEE SHOPS:

sID	sName	sLocation	sPhone
1	Kahve Dünyası	İstanbul, Kadıköy	555-2001
2	Starbucks	İstanbul, Beşiktaş	555-2002
3	Punto	İstanbul, Nişantaşı	555-2003
4	MOC	İstanbul, Taksim	555-2004
5	Kahve Durağı	Ankara, Çankaya	555-2005
6	Cafe Nero	İzmir, Alsancak	555-2006
7	V60 Coffee	Bursa, Osmangazi	555-2007
8	Cafe Gusto	Antalya, Kaleiçi	555-2008
9	Kahve Molası	Konya, Selçuklu	555-2009
10	Çaycı	Trabzon, Ortahisar	555-2010
NULL	NULL	NULL	NULL

MENUS:

	menuID	sID	mName
▶	1	1	Sabancı Menüsü
	2	1	Sabah Kahve Menüsü
	3	1	Sonbahar Akşam Menüsü
	4	2	Türk Lezzetleri Menüsü
	5	2	Kadıköy Menüsü
	6	3	Sıcak Kahve Menüsü
	7	3	Soğuk Kahve Menüsü
	8	4	Öğlen Keyfi Menüsü
	9	5	Tatlı Saatleri Menüsü
	10	6	Basic Kahve Menüsü
*	NULL	NULL	NULL

ORDERS:

	oID	sID	cID	oDate
	12456	1	5	2024-10-14
	12457	1	7	2024-10-15
	12458	2	8	2024-10-08
	12459	2	4	2024-10-14
	12460	3	3	2024-10-10
	12461	4	2	2024-10-11
	12462	5	6	2024-10-09
▶	12463	6	9	2024-10-13
	12464	7	1	2024-10-12
	12465	8	10	2024-10-14
*	NULL	NULL	NULL	NULL

PAYMENT:

	amount	pID	oID	PType	PStatus
▶	100	1	12456	Kredi Kartı	1
	250	2	12457	Nakit	0
	500	3	12458	Havale	1
	150	4	12456	Kredi Kartı	1
	300	5	12457	Nakit	0
	300	6	12459	Havale	1
	200	7	12462	Kredi Kartı	1
	150	8	12463	Nakit	0
	180	9	12464	Havale	1
	300	10	12465	Kredi Kartı	1
*	NULL	NULL	NULL	NULL	NULL

COFFEE ITEMS:

coffeeID	menuID	coffeeName	price	addOn
1	1	Turkish Coffee	80	Sugar
2	1	Americano	100	Irish Pump
3	1	Açai Latte	120	No
4	2	Latte	90	Toffee Nut
5	2	Cappuccino	90	Cinnamon
6	3	Macchiato	80	No
7	3	Kakao	70	Milk
8	4	Flat White	90	No
9	4	Mocha	95	Whipped Cream
10	5	Frappuccino	110	Chocolate Drizzle
NULL	NULL	NULL	NULL	NULL

INVENTORY:

inventoryID	remainingMilk	remainingCoffee	sID
1	500	1000	1
2	600	1100	2
3	450	900	3
4	300	700	4
5	400	800	5
6	550	1200	6
7	500	950	7
8	350	700	8
9	300	600	9
10	250	500	10
NULL	NULL	NULL	NULL

PROMOTION:

	inventoryID	remainingMilk	remainingCoffee	sID
▶	1	500	1000	1
	2	600	1100	2
	3	450	900	3
	4	300	700	4
	5	400	800	5
	6	550	1200	6
	7	500	950	7
	8	350	700	8
	9	300	600	9
	10	250	500	10
*	NULL	NULL	NULL	NULL

REVIEW:

	rID	sID	cID	rating
▶	1	1	1	4.5
	2	2	2	5
	3	3	3	3.7
	4	1	4	2.8
	5	4	5	4.2
	6	2	6	3
	7	5	7	4.9
	8	3	8	1.5
	9	6	9	4.1
	10	7	10	3.1
*	NULL	NULL	NULL	NULL

BARTENDER:

bID	sID	bName
1	1	Esther Berghmans
2	1	Ege Tan
3	2	Barış Alper
4	2	Kaan Ayhan
5	3	Fetih Kerim
6	4	Enes Kaan
7	5	Bora Alsancak
8	5	Açılay Tan
9	6	Çağatay Koçtuğ
10	7	Serdar Usta
NULL	NULL	NULL

MENU - COFFEE ITEM RELATION TABLE:

menuID	coffeeID
1	1
2	1
2	2
3	3
3	4
4	4
5	5
6	6
4	7
7	8

COFFEE- ORDER RELATION TABLE:

	oID	coffeeID	quantity
▶	12456	1	2
	12457	2	3
	12458	2	1
	12458	3	5
	12459	3	4
	12459	4	2
	12460	5	3
	12461	5	3
	12461	6	1
	12461	5	2