COASTAL CREAM ICE CREAM

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OUR COMPANY: COASTAL CREAM

- Founded by 5 SCU students
- Located on the Alameda
- Specializes in vanilla, chocolate, and strawberry ice cream
- Employees consist of scoopers and managers
- Utilize local suppliers

Database Description

Mission: Providing Customers with Quality Experience

- Managing inventory levels

  (CustomerID, OrderID, IngredientID, IceCreamID)

- Supply Chain efficiency

  (IceCreamID, IngredientID, SupplierID, IngredientRequest_ID, SupplierIngredientID)

- Employee performance

  (EmployeeID, Log Time, and OrderID)

DATA DICTIONARY

CUSTOMER

Name	Data Type	Constraints	Key	Description	Example Value
Customer_ID	numeric(11,0)	>0	PK	Unique identifier for a customer	1
CustomerName	varchar(25)			First and last name of customer	Justin Bieber
CustomerPhone	varchar(20)			Phone number of customer	6054756961
Order_ID	numeric(11,0)	>0	FK	Unique identifier for the customer order	1001

ORDER

Name	Data Type	Constraints	Key	Description	Example Value
Order_ID	numeric(11,0)	>0	PK	Unique identifier for the customer order	1001
OrderDate	date default getdate()			Date the order was taken	1/1/23
OrderTotal	numeric(11,2)	>0.0		Total amount of the order	50.13
Customer_ID	numeric(11,0)	>0	FK	Unique identifier for a customer	1

ORDER DETAILS

Name	Data Type	Constraints	Key	Description	Example Value
OrderID	numeric(11,0)	>0	PK, FK	Unique identifier for the customer order	1001
IceCream_ID	numeric(11,0)	>0	PK, FK	Unique identifier for the ice cream flavor	2002
IceCream_Price	numeric(11,2)	>0.0		Price of the ice cream	50.13
OrderedQuantity	numeric(11,0)	>0		The number of ice cream that the customer ordered	2

LOG TIME

Name	Data Type	Constraints	Key	Description	Example Value
Employee_ID	numeric(11,0)	>0	PK, FK	Unique identifier for employee	1
Shift_Date	date default getdate()			Day that the employee worked a shift	6/30/23
ShiftStart_Time	time	>00:00		Time the employee clocked into the shift	6:00
ShiftEnd_Time	time	>00:00		Time the employee clocked out of the shift	20:00
OrdersProcessed	numeric(11,0)	>0		Number of orders employees processed during shift	5
ScoopersEmployee_ID	numeric(11,0)	>0	FK	Unique identifier for scooper employee	1005
ManagerEmployee_ID	numeric(11,0)	>0	FK	Unique identifier for a manager employee	1006

ICE CREAM

Name	Data Type	Constraints	Key	Description	Example Value
IceCream_ID	numeric(11,0)	>0	PK	Unique identifier for the ice cream flavor	3
IceCream_Types	char(1)	('C','V','ST')		Discriminator for ice cream type, chocolate (C), vanilla (V), strawberry (ST)	V

VANILLA ICE CREAM

Name	Data Type	Constraints	Key	Description	Example Value
VanillaIceCream_ID	numeric(11,0)	>0	PK, FK	Unique identifier for vanilla ice cream	1003

CHOCOLATE ICE CREAM

Name	Data Type	Constraints	Key	Description	Example Value
ChocolateIceCream_ID	numeric(11,0)	>0	PK, FK	Unique identifier for chocolate ice cream	1002

STRAWBERRY ICE CREAM

Name	Data Type	Constraints	Key	Description	Example Value
StrawberryIceCream_ID	numeric(11,0)	>0	PK, FK	Unique identifier for strawberry ice cream	1004

INGREDIENT

Name	Data Type	Constraints	Key	Description	Example Value
Ingredient_ID	numeric(11,0)	>0	PK	Unique identifier for ingredient	736
IngredientName	varchar(25)			Name of ingredient used in ice cream	cocoa powder
IngredientInventory	numeric(11,0)	>0		Amount of ingredients in current inventory	43
IngredientReorder	Char(1)	("Y","N")		Reorder submission	Y
ChocolateIceCream_ID	numeric(11,0)	>0	FK	Unique identifier for chocolate ice cream	1002
VanillaIceCream_ID	numeric(11,0)	>0	FK	Unique identifier for vanilla ice cream	1003
StrawberryIceCream_ID	numeric(11,0)	>0	FK	Unique identifier for strawberry ice cream	1004

INGREDIENT USAGE

Name	Data Type	Constraints	Key	Description	Example Value
IceCreamID	numeric(11,0)	>0	PK, FK	Unique identifier for the ice cream flavor	3
Ingredient_ID	numeric(11,0)	>0	PK, FK	Unique identifier for ingredient	736
IngredientDate_Usage	date default getdate()			Date that the ingredient was used	9/12/30
Quantity_Usage	numeric(11,0)	>0		The amount of ingredients that were used	10

SUPPLIER

Name	Data Type	Constraints	Key	Description	Example Value
SupplierID	numeric(11,0)	>0	PK	Unique identifier for a supplier	395
SupplierName	varchar(25)			First and last name of supplier	Costco
SupplierPhone	varchar(20)	>0		Phone number of supplier	2024561111
DateofLastOrder	date default getdate()			Day of the last order from the supplier	5/10/22

SUPPLIER INGREDIENT

Name	Data Type	Constraints	Key	Description	Example Value
SupplierID	numeric(11,0)	>0	PK, FK	Unique identifier for a supplier	395
Ingredient_ID	numeric(11,0)	>0	PK, FK	Unique identifier for ingredient	736
IngredientRequest_ID	numeric(11,0)	>0	PK, FK	Unique identifier for request of ingredients	97856
Date Received	date default getdate()			Date that the ingredient was received by the company	2/13/22

EMPLOYEE

Name	Data Type	Constraints	Key	Description	Example Value
Employee_ID	numeric(11,0)	>0	PK	Unique identifier for employee	1
EmployeeName	varchar(30)			First and last name of employee	Bob Ross
EmployeeAddress	varchar(30)			Address of employee	350 Fifth Avenue
EmployeePhone	varchar(20)			Phone number of employee	6365553226
EmployeeHire_Date	date default getdate()			Date the employee was hired	5/23/21
EmployeeType	char(1)	('S','M')		Discriminator for employee type, scooper (S), manager(M)	S

SCOOPERS

Name	Data Type	Constraints	Key	Description	Example Value
ScoopersEmployee_ID	numeric(11,0)	>0	PK, FK	Unique identifier for scooper employee	1005

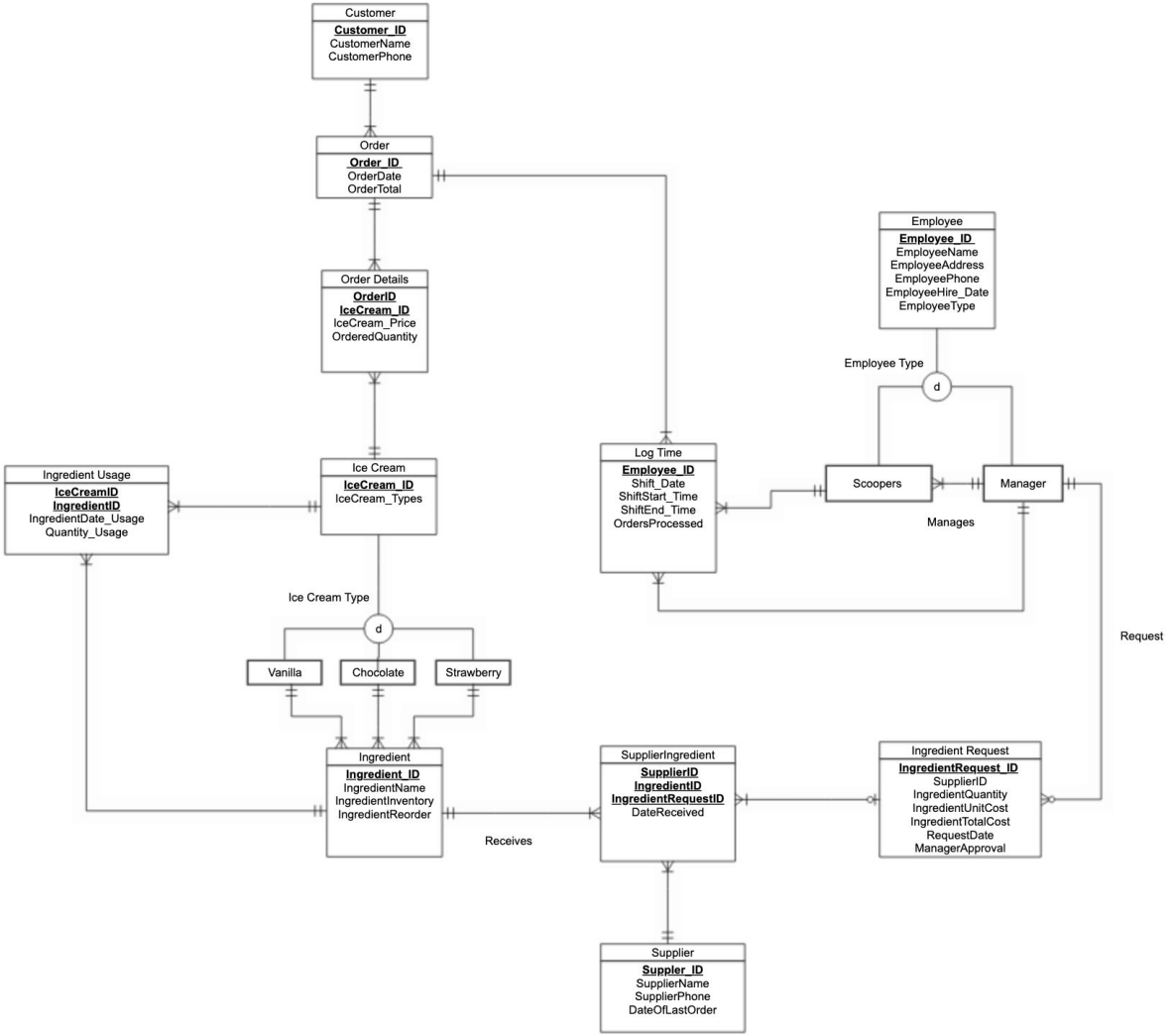
MANAGERS

Name	Data Type	Constraints	Key	Description	Example Value
ManagerEmployee_ID	numeric(11,0)	>0	PK, FK	Unique identifier for a manager employee	1006

INGREDIENT REQUEST

Name	Data Type	Constraints	Key	Description	Example Value
IngredientRequest_ID	numeric(11,0)	>0	PK	Unique identifier for request of ingredients	97856
SupplierID	numeric(11,0)	>0	PK, FK	Unique identifier for a supplier	395
IngredientQuantity	numeric(11,0)	>0		Amount of ingredients in the request	42
IngredientUnitCost	numeric(11,2)	>0.0		Unit cost of ingredient being requested	1.99
IngredientTotalCost	numeric(11,2)	>0.0		Total cost of ingredient being requested	14.5
IngredientRequestDate	date default getdate()			Date of ingredients requested by suppliers	9/12/23
ManagerApproval	Char(1)	("Y","N")		Approval status of request	Y
ManagerEmployee_ID	numeric(11,0)	>0	FK	Unique identifier for a manager employee	1006

ER Diagram


Customer
Customer_ID
CustomerName
CustomerPhone
Order
Order_ID
OrderDate
OrderTotal
Order Details
OrderID
IceCream_ID
IceCream_Price
OrderedQuantity
Employee
Employee_ID
EmployeeName
EmployeeAddress
EmployeePhone
EmployeeHire_Date
EmployeeType
Employee Type
d
Scoopers
Manager
Manages
Log Time
Employee_ID
Shift_Date
ShiftStart_Time
ShiftEnd_Time
OrdersProcessed
Ingredient Usage
IceCreamID
IngredientID
IngredientDate_Usage
Quantity_Usage
Ice Cream
IceCream_ID
IceCream_Types
Ice Cream Type
d
Vanilla
Chocolate
Strawberry
Request
Ingredient
Ingredient_ID
IngredientName
IngredientInventory
IngredientReorder
Receives
SupplierIngredient
SupplierID
IngredientID
IngredientRequestID
DateReceived
Ingredient Request
IngredientRequest_ID
SupplierID
IngredientQuantity
IngredientUnitCost
IngredientTotalCost
RequestDate
ManagerApproval
Supplier
Suppler_ID
SupplierName
SupplierPhone
DateOfLastOrder

Relational Model

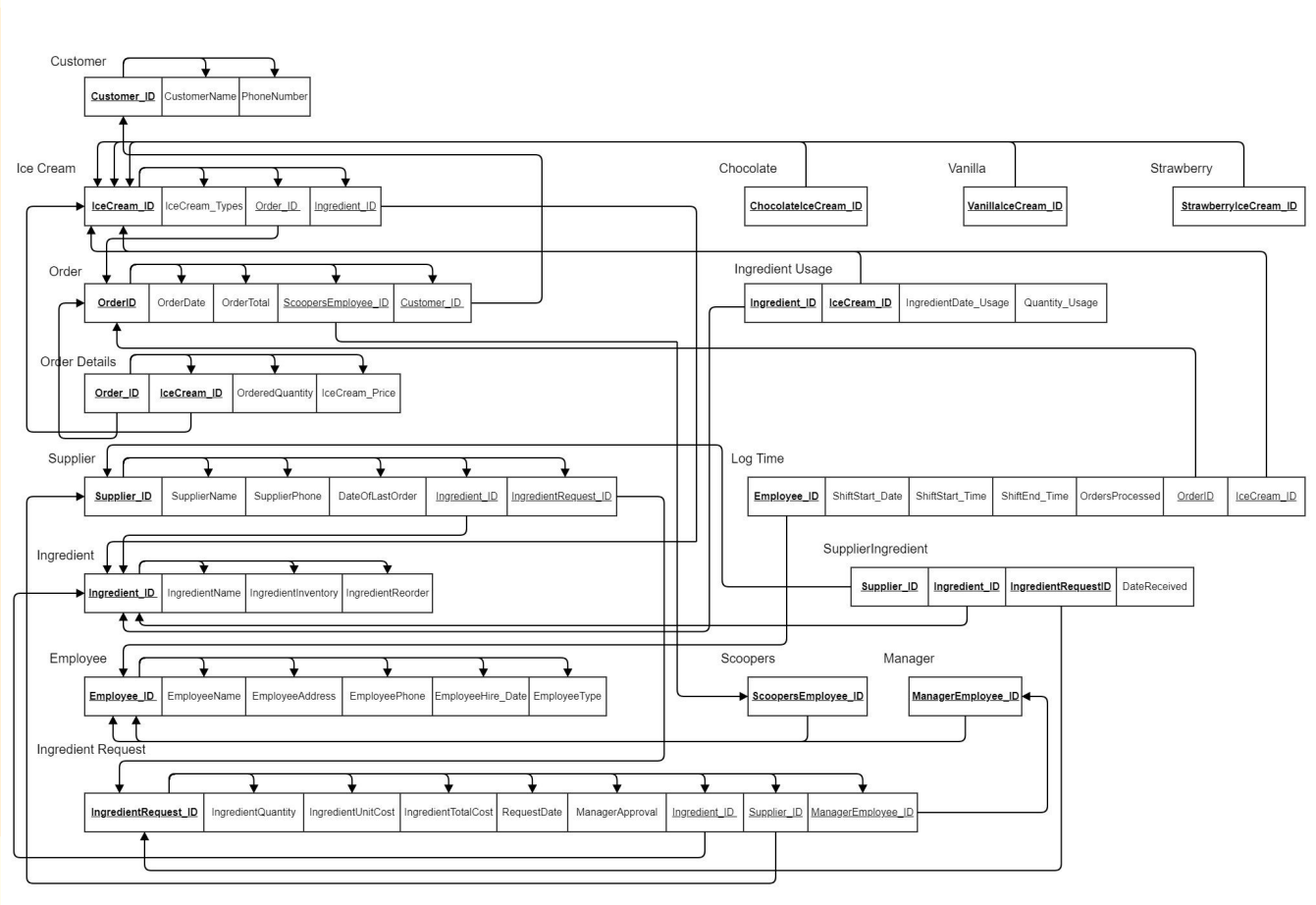


Table Queries

```
CREATE SCHEMA `OMIS105_Project` ;

CREATE TABLE `OMIS105_Project`.`ICE_CREAM` (
IceCream_ID INT(11)PRIMARY KEY,
    IceCream_Types CHAR(1) CHECK (IceCream_Types IN ('C', 'V', 'ST')));

CREATE TABLE `OMIS105_Project`.`VANILLA_ICE_CREAM` (
VanillaIceCream_ID INT(11) PRIMARY KEY,
    FOREIGN KEY (VanillaIceCream_ID) REFERENCES ICE_CREAM(IceCream_ID));

CREATE TABLE `OMIS105_Project`.`CHOCOLATE_ICE_CREAM` (
ChocolateIceCream_ID INT(11) PRIMARY KEY,
    FOREIGN KEY (ChocolateIceCream_ID) REFERENCES ICE_CREAM(IceCream_ID));

CREATE TABLE `OMIS105_Project`.`STRAWBERRY_ICE_CREAM` (
StrawberryIceCream_ID INT(11) PRIMARY KEY,
    FOREIGN KEY (StrawberryIceCream_ID) REFERENCES
ICE_CREAM(IceCream_ID));

CREATE TABLE `OMIS105_Project`.`SUPPLIER` (
  `SupplierID` INT NOT NULL,
  `SupplierName` VARCHAR(25) NOT NULL,
  `SupplierPhone` VARCHAR(20) NOT NULL,
  `DateofLastOrder` DATETIME NOT NULL,
  PRIMARY KEY (`SupplierID`));

CREATE TABLE `OMIS105_Project`.`EMPLOYEE` (
  `Employee_ID` INT NOT NULL,
  `EmployeeName` VARCHAR(45) NOT NULL,
  `EmployeeAddress` VARCHAR(45) NOT NULL,
  `EmployeePhone` VARCHAR(45) NOT NULL,
  `EmployeeHire_Date` DATE NOT NULL,
  `EmployeeType` CHAR(1) NOT NULL,
  PRIMARY KEY (`Employee_ID`));

CREATE TABLE `OMIS105_Project`.`SCOOPERS` (
ScoopersEmployee_ID INT(11) PRIMARY KEY CHECK);

CREATE TABLE `OMIS105_Project`.`MANAGERS` (
ManagerEmployee_ID INT(11) PRIMARY KEY);
```

```
CREATE TABLE `OMIS105_Project`.`SUPPLIER_INGREDIENT` (
  `SupplierID` INT NOT NULL REFERENCES SUPPLIER(SupplierID),
  `Ingredient_ID` INT NOT NULL REFERENCES INGREDIENT(Ingredient_ID),
  `IngredientRequest_ID` INT NOT NULL,
  `DateReceived` DATE NOT NULL,
  PRIMARY KEY (`SupplierID`));

CREATE TABLE `OMIS105_Project`.`INGREDIENT_REQUEST` (
    IngredientRequest_ID INT(11),
    SupplierID INT(11),
    IngredientQuantity INT(11),
    IngredientUnitCost DECIMAL(11,2),
    IngredientTotalCost DECIMAL(11,2),
    IngredientRequestDate DATE,
    ManagerApproval CHAR(1),
    ManagerEmployee_ID INT(11),
    FOREIGN KEY (SupplierID) REFERENCES SUPPLIER(SupplierID),
    FOREIGN KEY (ManagerEmployee_ID) REFERENCES
MANAGERS(ManagerEmployee_ID)
);

CREATE TABLE `OMIS105_Project`.`LOG_TIME` (
Employee_ID INT(11) PRIMARY KEY,
    Shift_Date DATE,
    ShiftStart_Time TIME,
    ShiftEnd_Time TIME,
    OrdersProcessed INT(11),
    ScoopersEmployee_ID INT(11) REFERENCES SCOOPERS(ScoopersEmployee_ID),
    ManagerEmployee_ID INT(11) REFERENCES MANAGERS(ManagerEmployee_ID));
-----
ALTER TABLE `OMIS105_Project`.`LOG_TIME`
CHANGE COLUMN `Shift_Date` `Shift_Date` DATE NOT NULL ,
CHANGE COLUMN `ShiftStart_Time` `ShiftStart_Time` TIME NOT NULL ,
CHANGE COLUMN `ShiftEnd_Time` `ShiftEnd_Time` TIME NOT NULL ,
CHANGE COLUMN `OrdersProcessed` `OrdersProcessed` INT NOT NULL ,
CHANGE COLUMN `ScoopersEmployee_ID` `ScoopersEmployee_ID` INT NOT NULL ,
CHANGE COLUMN `ManagerEmployee_ID` `ManagerEmployee_ID` INT NOT NULL ;

CREATE TABLE `OMIS105_Project`.`ORDER` (
Order_ID INT(11) PRIMARY KEY,
    OrderDate DATE,
    OrderTotal DECIMAL(11,2),
    Customer_ID INT(11),
    FOREIGN KEY (Customer_ID) REFERENCES CUSTOMER(Customer_ID));
```

```
CREATE TABLE `OMIS105_Project`.`ORDER` (
Order_ID INT(11) PRIMARY KEY,
OrderDate DATE,
OrderTotal DECIMAL(11,2),
Customer_ID INT(11)
);

CREATE TABLE `OMIS105_Project`.`CUSTOMER` (
Customer_ID INT(11) PRIMARY KEY,
    CustomerName VARCHAR(25),
```

```
    CustomerPhone VARCHAR(20),
    Order_ID INT(11));
-----
ALTER TABLE CUSTOMER ADD FOREIGN KEY (Order_ID) REFERENCES `ORDER`(Order_ID);
-----
ALTER TABLE `ORDER` ADD FOREIGN KEY (Customer_ID) REFERENCES CUSTOMER(Customer_ID);
-----
ALTER TABLE `OMIS105_Project`.`CUSTOMER`
CHANGE COLUMN `CustomerName` `CustomerName` VARCHAR(25) NOT NULL ,
CHANGE COLUMN `CustomerPhone` `CustomerPhone` VARCHAR(20) NOT NULL ,
CHANGE COLUMN `Order_ID` `Order_ID` INT NOT NULL ;

CREATE TABLE `OMIS105_Project`.`ORDER_DETAILS` (
OrderID INT(11) PRIMARY KEY,
IceCream_ID INT(11) REFERENCES ICE_CREAM(IceCream_ID),
IceCream_Price DECIMAL(11,2),
OrderedQuantity INT(11),
FOREIGN KEY (OrderID) REFERENCES `ORDER`(Order_ID));
-----
ALTER TABLE `OMIS105_Project`.`ORDER_DETAILS`
ADD COLUMN `ORDER_DETAILScol` VARCHAR(45) NOT NULL AFTER `OrderedQuantity`,
CHANGE COLUMN `IceCream_ID` `IceCream_ID` INT NOT NULL ,
CHANGE COLUMN `IceCream_Price` `IceCream_Price` DECIMAL(11,2) NOT NULL ,
CHANGE COLUMN `OrderedQuantity` `OrderedQuantity` INT NOT NULL ;

CREATE TABLE `OMIS105_Project`.`INGREDIENT` (
Ingredient_ID INT(11) PRIMARY KEY,
    IngredientName VARCHAR(25),
    IngredientInventory INT(11),
    IngredientReorder CHAR(1),
    ChocolateIceCream_ID INT(11) REFERENCES CHOCOLATE_ICE_CREAM(ChocolateIceCream_ID),
    VanillaIceCream_ID INT(11) REFERENCES VANILLA_ICE_CREAM(VanillaIceCream_ID),
    StrawberryIceCream_ID INT(11) REFERENCES STRAWBERRY_ICE_CREAM(StrawberryIceCream_ID));
```

MySQL Queries

External Views &
Business Justifications

Scenario #1

In this first scenario, the ice cream shop is expanding its menu and wants to analyze the popularity of different ice cream flavors among customers. The management seeks to identify the top three best-selling flavors over a specific period to inform marketing and production strategies. Understanding customer preferences is vital for tailoring the menu to meet demand and maximize sales. By identifying the most popular ice cream flavors, the business can focus on promoting and producing these flavors, ensuring customer satisfaction and driving revenue growth. The query is designed to provide a clear and concise report on the top three best-selling ice cream flavors. By counting the number of order lines for each flavor and ordering the results based on total sales in descending order, the business can quickly identify the most popular flavors. The use of aliases (`ic` and `ol`) simplifies the query, and the `LIMIT 3` ensures that only the top three results are included, aligning with the business goal of focusing on the most popular flavors for marketing and production strategies.

Scenario #1 Overview:

Ice cream shop expanding menu

- Analyzing popularity of ice cream flavors among customers

- Objective:
  - Identify top three best-selling flavors
  - Inform marketing and production strategies
- Importance:
  - Understand customer preferences for tailored menu
  - Maximize sales and drive revenue growth
- Query Design:
  - Report on top three best-selling flavors
  - Count order lines for each flavor
  - Order results based on total sales in descending order
- Query Optimization:
  - Use of aliases (`ic` and `ol`) for query simplification
  - `LIMIT 3` ensures inclusion of only the top three results
- Business Impact:
  - Focus on promoting and producing most popular flavors
  - Enhance customer satisfaction and drive revenue growth

```sql
-- Retrieve the top three most popular ice cream flavors and their total sales
SELECT
    IC.IceCream_ID,
    IC.IceCream_Types AS IceCreamType,
    SUM(OD.OrderedQuantity) AS TotalQuantitySold,
    SUM(OD.IceCream_Price * OD.OrderedQuantity) AS TotalSales
FROM
    ORDER_DETAILS OD
JOIN
    ICE_CREAM IC ON OD.IceCream_ID = IC.IceCream_ID
GROUP BY
    IC.IceCream_ID, IC.IceCream_Types
ORDER BY
    TotalQuantitySold DESC
LIMIT 3;
```

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Result Grid Filter Rows: Search Export:

IceCream_ID	IceCreamType	TotalQuantityS...	TotalSales

Scenario #2

We closely monitor inventory levels to ensure timely restocking of goods at Coastal. Our goal is to maintain an inventory turnover ratio within the industry standard range of 4 to 8. When inventory levels fall below the lower threshold, the manager will initiate a new order request to the supplier. To document inventory and supplier information, we use IceCreamID, IngredientID, SupplierID, IngredientRequest ID, and SupplierIngredient ID.

IceCreamID and IngredientID will help us track ingredient availability for each ice cream type. Since each ice cream type has a unique recipe, ingredient requests are placed with different suppliers, specifically local farms known for their high-quality ingredients.

After the manager places an order, Coastal waits approximately 7 business days for the ingredients to arrive. Upon their arrival, workers measure the ingredients and use our in-store ice cream machine to craft the finest-tasting ice cream.

Scenario #2 Overview:

Inventory monitoring for timely restocking at Coastal Cream

- Objective:
  - Maintain inventory turnover ratio (4 to 8) within industry standards
- Inventory Tracking:
  - Utilize IceCreamID, IngredientID, SupplierID, IngredientRequest ID, and SupplierIngredient ID
- Ingredient Availability:
  - IceCreamID and IngredientID track availability for each ice cream type
  - Unique recipes for each ice cream type
- Supplier Collaboration:
  - Place ingredient requests with different suppliers
  - Specific focus on local farms with high-quality ingredients
- Order Placement Process:
  - Manager initiates order request when inventory falls below threshold
  - Wait approximately 7 business days for ingredient arrival
- Production Process:
  - Upon ingredient arrival, workers measure and use in-store ice cream machine
  - Craft finest-tasting ice cream

```sql
-- Monitor inventory levels and supplier data for restocking
SELECT
    INGREDIENT.Ingredient_ID,
    INGREDIENT.IngredientName,
    INGREDIENT.IngredientInventory,
    INGREDIENT.IngredientReorder,
    SUPPLIER.SupplierID,
    SUPPLIER.SupplierName,
    SUPPLIER.SupplierPhone,
    INGREDIENT_REQUEST.IngredientRequest_ID,
    INGREDIENT_REQUEST.IngredientQuantity,
    INGREDIENT_REQUEST.IngredientUnitCost,
    INGREDIENT_REQUEST.IngredientTotalCost,
    INGREDIENT_REQUEST.IngredientRequestDate
FROM
    INGREDIENT
JOIN
    SUPPLIER_INGREDIENT ON INGREDIENT.Ingredient_ID = SUPPLIER_INGREDIENT.Ingredient_ID
JOIN
    SUPPLIER ON SUPPLIER_INGREDIENT.SupplierID = SUPPLIER.SupplierID
LEFT JOIN
    INGREDIENT_REQUEST ON SUPPLIER_INGREDIENT.IngredientRequest_ID = INGREDIENT_REQUEST.IngredientRequest_ID
WHERE
    INGREDIENT.IngredientReorder = 'Y';
```

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Result Grid Filter Rows: Search Export:

Ingredient_ID	IngredientName	IngredientInvent...	IngredientReord...	SupplierID	SupplierName	SupplierPhone	IngredientRequest_...	IngredientQuant...	IngredientUnitC...	IngredientTotalC...	IngredientReque
1	cocoa powder	43	Y	395	Costco	2024561111	97856	42	1.99	14.50	2023-09-12
3	strawberry puree	35	Y	397	US Foods	4085553333	97858	35	1.75	61.25	2023-11-15
4	sugar	50	Y	398	Gordon Food Service	6504444444	97859	50	3.00	150.00	2023-12-20

Scenario #3:

We evaluate employee performance by examining EmployeeID, Log Time, and OrderID at Coastal. Coastal has two categories of employees, scoopers, and managers. Both are required to operate the ice cream machine and assist customers. So, employees will log into their shifts, each identified by a unique EmployeeID, and we keep track of the number of orders they process. This approach will provide Coastal Cream with insights into how tasks are distributed among employees and help determine if additional workers are required during shifts.

Scenario #3 Overview:

Employee performance evaluation at Coastal Cream

- Objective:
  - Examine EmployeeID, Log Time, and OrderID for performance insights
- Employee Categories:
  - Two categories: scoopers and managers
  - Both required to operate ice cream machine and assist customers
- Shift Logging:
  - Employees log into unique shifts identified by EmployeeID
  - Log Time is recorded for each shift
- Task Distribution:
  - Track the number of orders processed by each employee
  - Insights into task distribution among employees
- Workforce Optimization:
  - Determine if additional workers are required during shifts
  - Optimize workforce for efficient operations

```
414
415     -- Analyze employee efficiency by tracking orders processed
416     SELECT
417         LOG_TIME.Employee_ID,
418         LOG_TIME.Shift_Date,
419         LOG_TIME.ShiftStart_Time,
420         LOG_TIME.ShiftEnd_Time,
421         LOG_TIME.OrdersProcessed,
422         EMPLOYEE.EmployeeName,
423         EMPLOYEE.EmployeeType
424     FROM
425         LOG_TIME
426     JOIN
427         EMPLOYEE ON LOG_TIME.Employee_ID = EMPLOYEE.Employee_ID;
428
```

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Result Grid Filter Rows: Search Export:

Employee_ID	Shift_Date	ShiftStart_Ti...	ShiftEnd_Time	OrdersProcessed	EmployeeName	EmployeeType
1	2023-06-30	06:00:00	20:00:00	5	Bob Ross	S
2	2023-07-15	07:30:00	21:30:00	8	Amanda White	M
3	2023-08-02	08:00:00	22:00:00	3	John Doe	S
4	2023-09-20	09:00:00	23:00:00	10	Sara Johnson	S
5	2023-10-05	10:30:00	18:30:00	6	Michael Smith	M

Thank You!