

MIDDLE EAST TECHNICAL UNIVERSITY

Inventory Sales (Stock Levels)

FINAL PROJECT REPORT SUBMITTED
IN FULFILMENT OF THE REQUIREMENTS FOR
COURSE STAT311

DEPARTMENT OF STATISTICS OF
MIDDLE EAST TECHNICAL UNIVERSITY
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Table of Contents

Table of Contents	2
Introduction	3
ER Diagram	4
Relational Schema.....	5
Phyton Connection.....	6
Modifications	7
Employee Schema.....	8
Employee Table.....	8
Department Schema.....	10
Department Table	11
Customer Schema	15
Customer Table.....	15
Order Schema	17
Order Table.....	18
Product Schema.....	22
Product Table.....	22
Sales Schema.....	25
Sales Table	26
Stock Schema.....	29
Stock Table	29
Supplier Schema.....	32
Supplier Table	32
Category Schema	35
Category Table.....	35
Payment Schema	40
Payment Table.....	40
Division Of Labor.....	44

Introduction

Systems for managing inventory and sales are essential to the profitability and efficiency of companies operating in the retail and distribution industries. This project's main goal is to create and implement a relational database system that will make it easier to handle key business processes, including clients, goods, orders, staff, and suppliers. Using well-structured entities and connections, the Inventory Sales Information System (ISIS) makes it possible to efficiently organize and retrieve data.

Key entities comprise the database:

Customers: Keeps track of client data, such as phone numbers, identification numbers, and product preferences.

Orders: Keeps track of client order progress, including order date, total amount, and mode of payment.

Categories and Products: Simplifies inventory control by classifying product information.

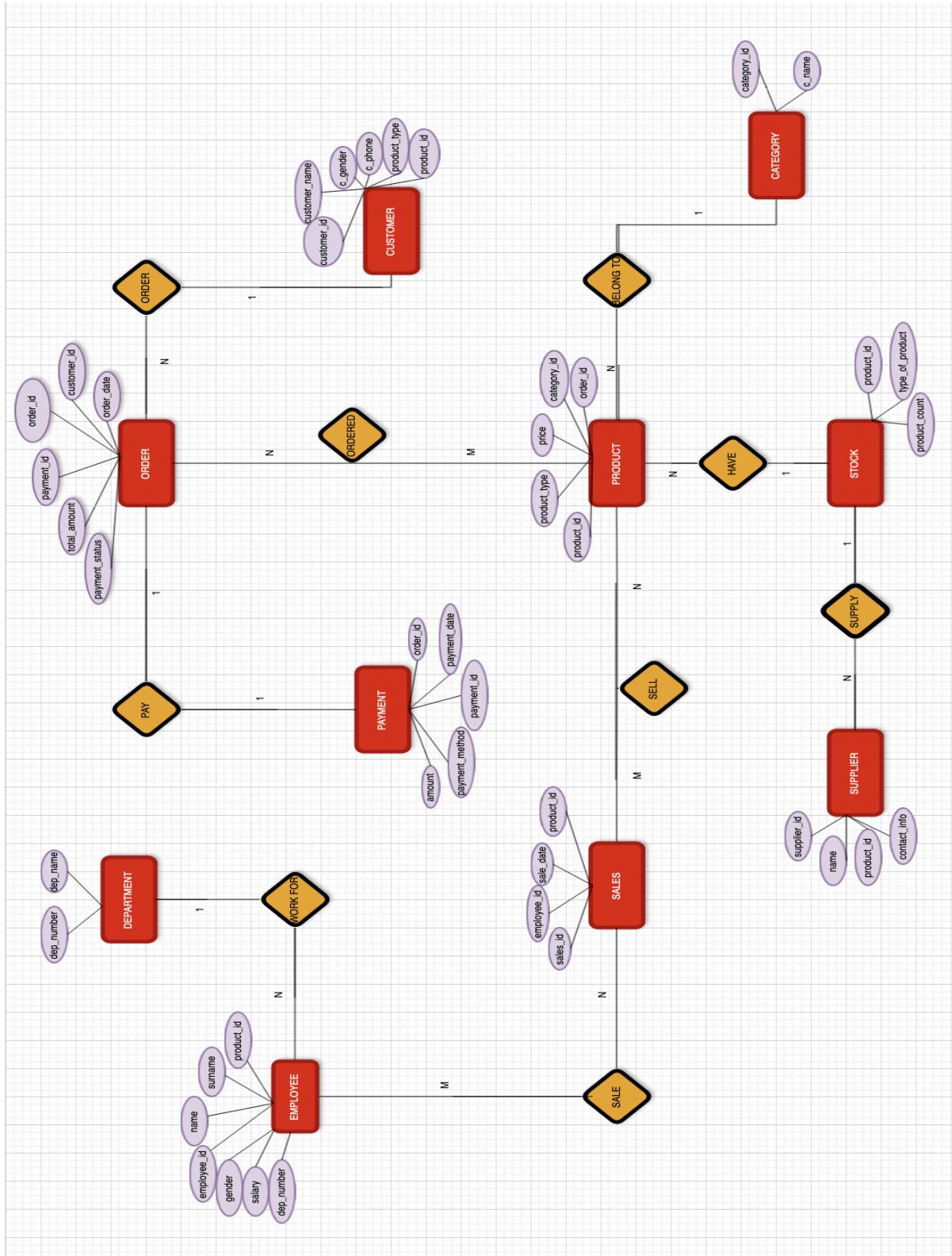
Departments and Employees: Oversees employees' roles, duties, and departmental affiliations.

Stocks and Suppliers: Maintains control over supplier relationships and inventory levels to guarantee product availability.

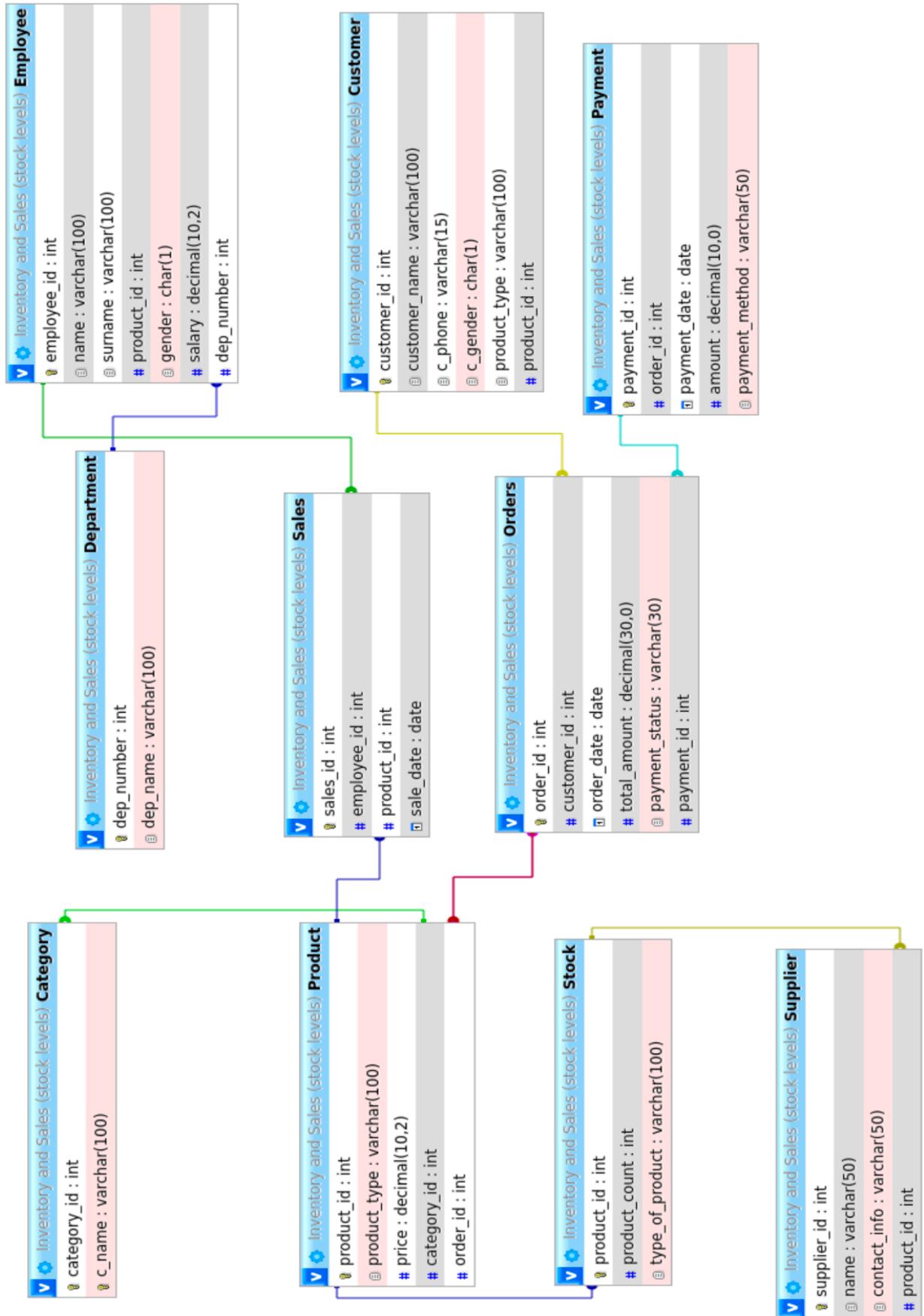
Sales and Payments: Ensures financial accuracy by monitoring the status of sales and payment transactions.

The system was developed using MySQL Server 8.0 and was intended to use constraints, foreign keys, and indexes to ensure data integrity and maximize query performance. It makes complex business questions easier, such as determining which products are the best sellers, analyzing customer behavior, and keeping track of inventory levels. By combining entities and connections, the system creates a solid basis for efficient inventory and sales management that is ready for additional scalability and advanced analytics.

ER Diagram

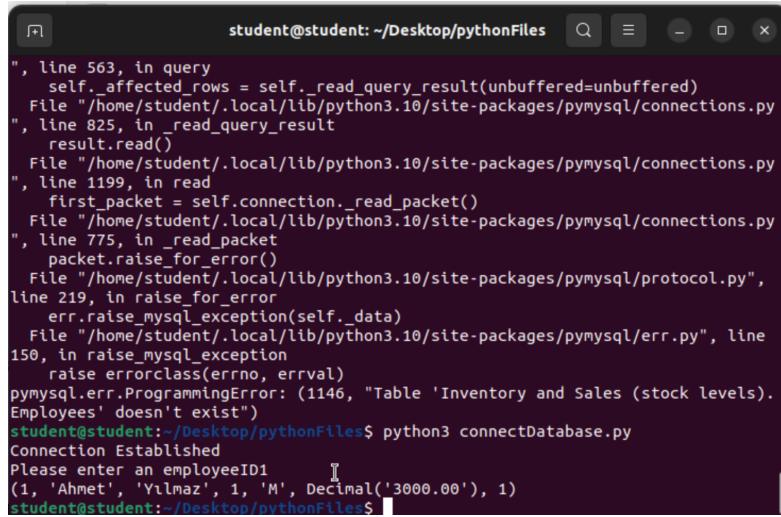


RELATIONAL SCHEMA

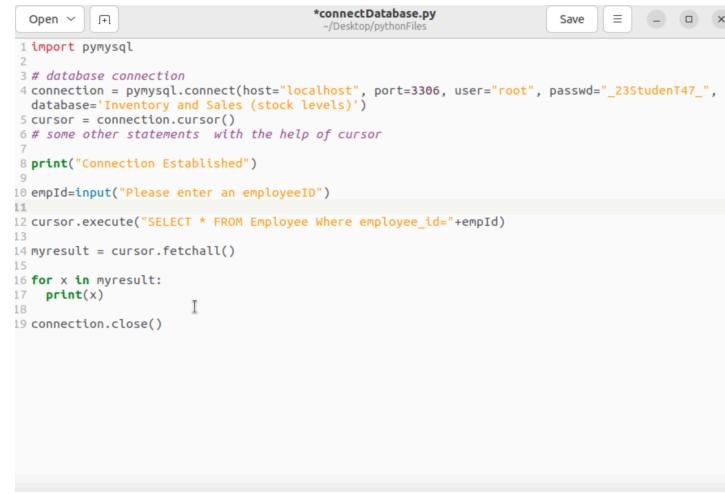


PYTHON CONNECTION

TERMINAL



```
student@student: ~/Desktop/pythonFiles
", line 563, in query
    self._affected_rows = self._read_query_result(unbuffered=unbuffered)
  File "/home/student/.local/lib/python3.10/site-packages/pymysql/connections.py
", line 825, in _read_query_result
    result.read()
  File "/home/student/.local/lib/python3.10/site-packages/pymysql/connections.py
", line 1199, in read
    first_packet = self.connection._read_packet()
  File "/home/student/.local/lib/python3.10/site-packages/pymysql/connections.py
", line 775, in _read_packet
    packet.raise_for_error()
  File "/home/student/.local/lib/python3.10/site-packages/pymysql/protocol.py",
line 219, in raise_for_error
    err.raise_mysql_exception(self._data)
  File "/home/student/.local/lib/python3.10/site-packages/pymysql/err.py", line
150, in raise_mysql_exception
    raise errorclass(errno, errval)
pymysql.err.ProgrammingError: (1146, "Table 'Inventory and Sales (stock levels).Employees' doesn't exist")
student@student:~/Desktop/pythonFiles$ python3 connectDatabase.py
Connection Established
Please enter an employeeID1
(1, 'Ahmet', 'Yilmaz', 1, 'M', Decimal('3000.00'), 1)
student@student:~/Desktop/pythonFiles$
```



```
Open ▾ Save ▾
*connectDatabase.py
~/Desktop/pythonFiles
1 import pymysql
2
3 # database connection
4 connection = pymysql.connect(host="localhost", port=3306, user="root", passwd="_23Student47_",
5 database='Inventory and Sales (stock levels)')
6 cursor = connection.cursor()
7 # some other statements with the help of cursor
8 print("Connection Established")
9
10 empId=input("Please enter an employeeID")
11
12 cursor.execute("SELECT * FROM Employee Where employee_id="+empId)
13
14 myresult = cursor.fetchall()
15
16 for x in myresult:
17     print(x)
18
19 connection.close()
```

IN SQL



Run SQL query/queries on table **Inventory and Sales (stock levels).Employee**:

```
1 SELECT *
2 FROM Employee
3 WHERE employee_id=1;
```



	employee_id	name	surname	product_id	gender	salary	dep_number
1	1	Ahmet	Yilmaz	1	M	3000.00	1

MODIFICATIONS (INSERT, DELETE, UPDATE)

INSERT

```
1 INSERT INTO Employee (employee_id, name, surname, product_id, gender, salary, dep_number)
2 VALUES (22, 'Öykü', 'Yılmaz', 21, 'F', 3500, 11);
3 |
```

✓ 1 row inserted. (Query took 0.0187 seconds.)

```
INSERT INTO Employee (employee_id, name, surname, product_id, gender, salary, dep_number) VALUES (22, 'Öykü', 'Yılmaz', 21, 'F', 3500, 11);
```

[Edit inline] [Edit] [Create PHP code]

DELETE

```
1 DELETE FROM Sales
2 WHERE product_id = 5;
3 |
```

✓ 1 row affected. (Query took 0.0126 seconds.)

```
DELETE FROM Sales WHERE product_id = 5;
```

[Edit inline] [Edit] [Create PHP code]

UPDATE

```
1 UPDATE Sales
2 SET product_id = NULL
3 WHERE product_id = 5;
4 |
```

✓ 0 rows affected. (Query took 0.0021 seconds.)

```
UPDATE Sales SET product_id = NULL WHERE product_id = 5;
```

[Edit inline] [Edit] [Create PHP code]

EMPLOYEE SCHEMA

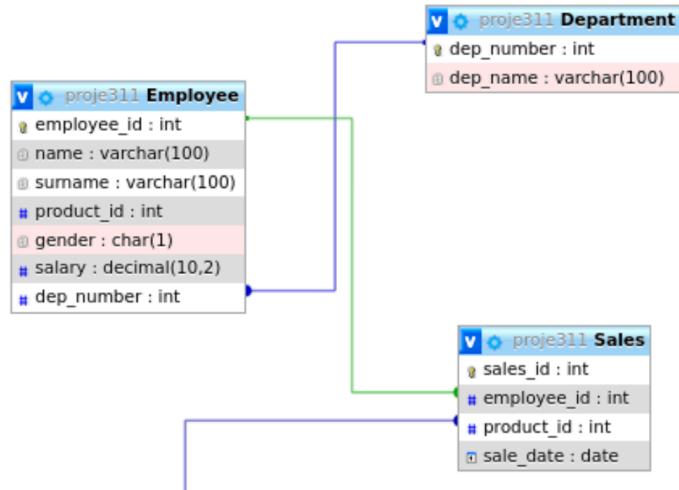
#	Name	Type	Collation	Attributes	Null	Default
1	employee_id	int			No	None
2	name	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL
3	surname	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL
4	product_id	int			No	None
5	gender	char(1)	utf8mb4_0900_ai_ci		Yes	NULL
6	salary	decimal(10,2)			Yes	NULL
7	dep_number	int			Yes	NULL

This entity, Employee, involves some general informations about the employees such as: id numbers of employees (**employee_id**) which is primary key for this table, names (**name**) and surnames employees (**surname**), id of product that they sold (**product_id**), their gender (**gender**), their salary (**salary**) and their department number that they work for (**dep_number**).

EMPLOYEE TABLE

		employee_id	name	surname	product_id	gender	salary	dep_number
	Edit Copy Delete	1	Ahmet	Yılmaz	1	M	3000.00	1
	Edit Copy Delete	2	Elif	Demir	2	F	3500.00	12
	Edit Copy Delete	3	Hasan	Özdemir	3	M	2800.00	13
	Edit Copy Delete	4	Ayşe	Aksoy	4	F	3200.00	9
	Edit Copy Delete	5	Mehmet	Kaya	5	M	3400.00	7
	Edit Copy Delete	6	Zeynep	Çelik	6	F	3300.00	8
	Edit Copy Delete	7	Emre	Koç	7	M	3100.00	17
	Edit Copy Delete	8	Aylin	Erdem	8	F	3000.00	3
	Edit Copy Delete	9	Ali	Can	9	M	3200.00	2
	Edit Copy Delete	10	Fatma	Yıldız	10	F	3000.00	1
	Edit Copy Delete	11	Seda	Turan	11	F	2900.00	20
	Edit Copy Delete	12	Murat	Kara	12	M	2700.00	15
	Edit Copy Delete	13	İsmail	Tosun	13	M	3300.00	16
	Edit Copy Delete	14	Sibel	Özkan	14	F	3100.00	14
	Edit Copy Delete	15	Bariş	Şahin	15	M	3500.00	1
	Edit Copy Delete	16	Gökhan	Büyük	16	M	2800.00	2
	Edit Copy Delete	17	Dilek	Yılmaz	17	F	3000.00	6
	Edit Copy Delete	18	Berk	Çetin	18	M	2900.00	2
	Edit Copy Delete	19	Merve	Yalçın	19	F	3400.00	14
	Edit Copy Delete	20	Rıza	Özdemir	20	M	3000.00	2

RELATION SCHEMA



QUERIES

What are the names and surnames of the people who earn more than 3300 units ?

```
1 SELECT *
2 FROM
3     Employee
4 WHERE
5     salary > 3300;
```

	employee_id	name	surname	product_id	gender	salary	dep_number
<input type="checkbox"/>	Edit Copy Delete	Elif	Demir	2	F	3500.00	12
<input type="checkbox"/>	Edit Copy Delete	Mehmet	Kaya	5	M	3400.00	7
<input type="checkbox"/>	Edit Copy Delete	Baş	Şahin	15	M	3500.00	1
<input type="checkbox"/>	Edit Copy Delete	Merve	Yalçın	19	F	3400.00	14

How much does the average salary of employees differ by gender?

```
1 | SELECT
2 |     gender AS Gender,
3 |     AVG(salary) AS Average_salary
4 | FROM
5 |     Employee
6 | GROUP BY
7 |     gender;
```

+ Options		Gender	Average_salary
<input type="checkbox"/>	Edit Copy Delete M		3063.636364
<input type="checkbox"/>	Edit Copy Delete F		3155.555556

DEPARTMENT SCHEMA

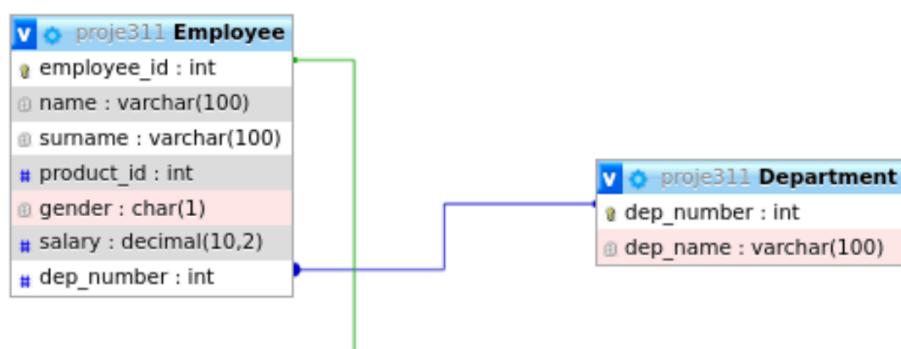
#	Name	Type	Collation	Attributes	Null	Default
<input type="checkbox"/>	1 dep_number	int			No	None
<input type="checkbox"/>	2 dep_name	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL

This entity (Department), contains information about the departments in which employees are located. Department number (**dep_number**) is the primary key for this table. In addition ,the table includes department names (**dep_name**).

DEPARTMENT TABLE

	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	dep_number	dep_name
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	1	Cashier
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	2	Floor Staff
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	3	Manager
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	4	Customer Service
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	5	Stock Manager
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	6	Sales Associate
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	7	Technician
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	8	Logistics
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	9	Delivery Coordinator
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	10	HR Specialist
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	11	Inventory Specialist
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	12	IT Support
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	13	Marketing
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	14	Finance
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	15	Assistant Manager
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	16	Warehouse Manager
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	17	Quality Control
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	18	Product Specialist
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	19	Security
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	20	Operations Manager

RELATION SCHEMA



QUERIES

How many employees are there in each department?

```
1 SELECT
2     D.dep_name AS Department_Name,
3     COUNT(E.employee_id) AS Employee_count
4 FROM
5     Department D
6 LEFT JOIN
7     Employee E
8 ON
9     D.dep_number = E.dep_number
10 GROUP BY
11     D.dep_name;|
```

Department_Name	Employee_count
Cashier	3
Floor Staff	4
Manager	1
Customer Service	0
Stock Manager	0
Sales Associate	1
Technician	1
Logistics	1
Delivery Coordinator	1
HR Specialist	0
Inventory Specialist	0
IT Support	1
Marketing	1
Finance	2
Assistant Manager	1
Warehouse Manager	1
Quality Control	1
Product Specialist	0
Security	0
Operations Manager	1

Who are the cashiers and floor staff and how much are their salaries? Is there a difference between the average salaries of these departments?

```
1 SELECT
2     dep_name AS Department_Name,
3     name AS Name,
4     surname AS Surname,
5     salary AS Salary
6 FROM
7     Employee E
8 JOIN
9     Department D
10 ON
11     E.dep_number = D.dep_number
12 WHERE
13     dep_name IN ('Floor Staff', 'Cashier');

15 SELECT
16     dep_name AS Department_Name,
17     AVG(salary) AS Average_salary
18 FROM
19     Employee E
20 JOIN
21     Department D
22 ON
23     E.dep_number = D.dep_number
24 WHERE
25     dep_name IN ('Floor Staff', 'Cashier')
26 GROUP BY
27     dep_name;
```

Department_Name	Name	Surname	Salary
Cashier	Ahmet	Yılmaz	3000.00
Cashier	Fatma	Yıldız	3000.00
Cashier	Banış	Şahin	3500.00
Floor Staff	Ali	Can	3200.00
Floor Staff	Gökhan	Büyük	2800.00
Floor Staff	Berk	Çetin	2900.00
Floor Staff	Rıza	Özdemir	3000.00

Department_Name	Average_salary
Cashier	3166.666667
Floor Staff	2975.000000

Who are the employees whose name starts with "a" or ends with "a"?

```
1 SELECT
2     name AS Name,
3     surname AS Surname
4 FROM
5     Employee
6 WHERE
7     name LIKE 'A%' OR name LIKE '%A'
8 ORDER BY
9     name;
```

		Name	Surname
<input type="checkbox"/>	Edit Copy Delete	Ahmet	Yılmaz
<input type="checkbox"/>	Edit Copy Delete	Ali	Can
<input type="checkbox"/>	Edit Copy Delete	Aylin	Erdem
<input type="checkbox"/>	Edit Copy Delete	Ayşe	Aksoy
<input type="checkbox"/>	Edit Copy Delete	Fatma	Yıldız
<input type="checkbox"/>	Edit Copy Delete	Rıza	Özdemir
<input type="checkbox"/>	Edit Copy Delete	Seda	Turan

CUSTOMER SCHEMA

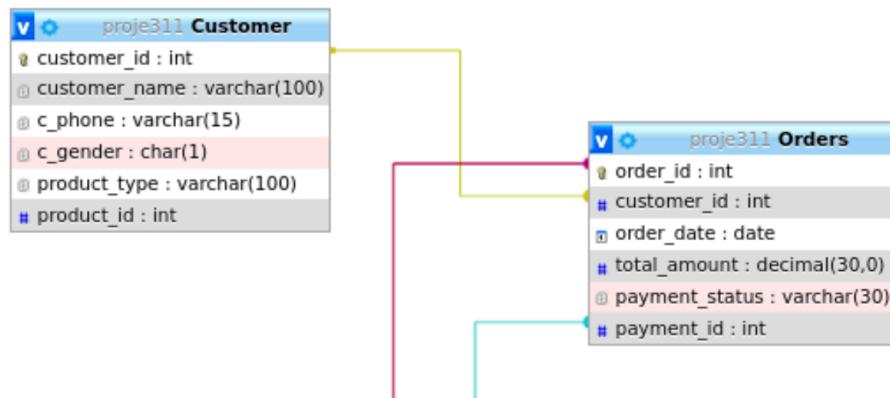
#	Name	Type	Collation	Attributes	Null	Default
1	customer_id 	int			No	<i>None</i>
2	customer_name	varchar(100)	utf8mb4_0900_ai_ci		Yes	<i>NULL</i>
3	c_phone	varchar(15)	utf8mb4_0900_ai_ci		Yes	<i>NULL</i>
4	c_gender	char(1)	utf8mb4_0900_ai_ci		Yes	<i>NULL</i>
5	product_type	varchar(100)	utf8mb4_0900_ai_ci		Yes	<i>NULL</i>
6	product_id 	int			Yes	<i>NULL</i>

This entity, Customer, involves some general informations about the customers such as: id numbers of customers (**customer_id**) which is primary key for this table, names of customers (**customer_name**), phone numbers of customers (**c_phone**), genders of the customers (**c_gender**), type of product that they bought (**product_type**), id numbers of product that they bought (**product_id**).

CUSTOMER TABLE

← ↑ →	▼	customer_id	customer_name	c_phone	c_gender	product_type	product_id
  	1		Caner	05345678901	M	Laptop	1
  	2		Selin	05431234567	F	Phone	2
  	3		Okan	05321234567	M	Headphones	3
  	4		Ebru	05445678912	F	Monitor	4
  	5		Bora	05337894567	M	Keyboard	5
  	6		Dilara	05456789012	F	Mouse	6
  	7		Engin	05329876543	M	Tablet	7
  	8		Buse	05445678943	F	Smartwatch	8
  	9		Kemal	05323456789	M	Speaker	9
  	10		Esra	05434567890	F	Printer	10

RELATION SCHEMA



QUERIES

What are the product types and id's purchased by female customers?

```
1 | SELECT customer_id, product_type, c_gender
2 | FROM Customer
3 | WHERE c_gender = "F";
```

		customer_id	product_type	c_gender
<input type="checkbox"/>	Edit Copy Delete	2	Phone	F
<input type="checkbox"/>	Edit Copy Delete	4	Monitor	F
<input type="checkbox"/>	Edit Copy Delete	6	Mouse	F
<input type="checkbox"/>	Edit Copy Delete	8	Smartwatch	F
<input type="checkbox"/>	Edit Copy Delete	10	Printer	F
<input type="checkbox"/>	Edit Copy Delete	12	Hard Drive	F
<input type="checkbox"/>	Edit Copy Delete	14	Microphone	F
<input type="checkbox"/>	Edit Copy Delete	16	Air Conditioner	F
<input type="checkbox"/>	Edit Copy Delete	18	Heater	F
<input type="checkbox"/>	Edit Copy Delete	20	Washing Machine	F

What are the phone numbers of male customers ?

```
1 SELECT c_phone
2 FROM `Customer`
3 WHERE c_gender = "M";
```

c_phone			
	Edit	Copy	Delete
		05345678901	
		05321234567	
		05337894567	
		05329876543	
		05323456789	
		05355678912	
		05327894567	
		05394567891	
		05389456723	
		05381234567	

ORDER SCHEMA

#	Name	Type	Collation	Attributes	Null	Default
1	order_id	int			No	None
2	customer_id	int			No	None
3	order_date	date			No	None
4	total_amount	decimal(30,0)			No	None
5	payment_status	varchar(30)	utf8mb4_0900_ai_ci		No	None
6	payment_id	int			No	None

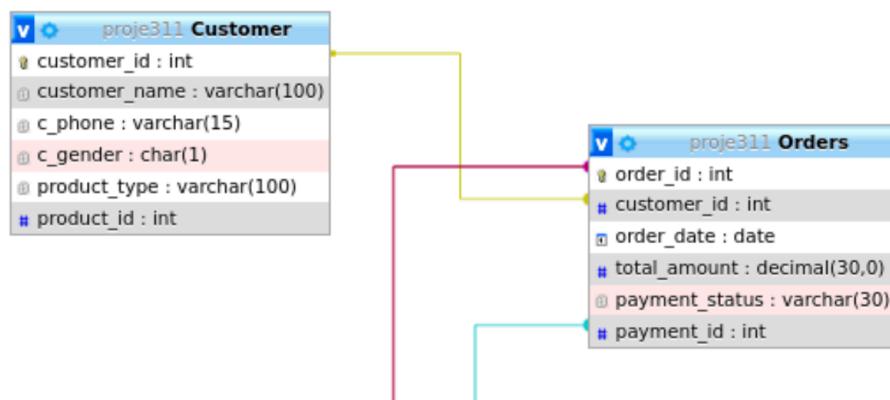
This entity, Orders, involves some general informations about the orders which is ordered by the customers such as: id numbers of orders (**order_id**), id numbers of customers (**customer_id**), date of orders (**order_date**), total amount of orders (**total_amount**), status of payment that they paid (**payment_status**), id of payment that they paid (**payment_id**).

ORDER TABLE

(First 10 examples of Orders data)

		order_id	customer_id	order_date	total_amount	payment_status	payment_id
<input type="checkbox"/>	Edit Copy Delete	1	1	2025-01-01	101	Paid	1
<input type="checkbox"/>	Edit Copy Delete	2	2	2025-01-02	201	Pending	2
<input type="checkbox"/>	Edit Copy Delete	3	3	2025-01-03	150	Paid	3
<input type="checkbox"/>	Edit Copy Delete	4	4	2025-01-04	175	Failed	4
<input type="checkbox"/>	Edit Copy Delete	5	5	2025-01-05	225	Paid	5
<input type="checkbox"/>	Edit Copy Delete	6	6	2025-01-06	111	Pending	6
<input type="checkbox"/>	Edit Copy Delete	7	7	2025-01-07	300	Paid	7
<input type="checkbox"/>	Edit Copy Delete	8	8	2025-01-08	95	Failed	8
<input type="checkbox"/>	Edit Copy Delete	9	9	2025-01-09	121	Paid	9
<input type="checkbox"/>	Edit Copy Delete	10	10	2025-01-10	251	Pending	10

RELATION SCHEMA



QUERIES

What are the names, id's, phone numbers, and order dates of the customers who ordered (total amount of orders) more than 200?

```
1 SELECT
2     c.customer_id,
3     c.customer_name,
4     c.c_phone,
5     o.order_date,
6     SUM(o.total_amount) AS total_amount
7 FROM
8     Customer c
9 INNER JOIN
10    Orders o
11 ON
12     c.customer_id = o.customer_id
13 GROUP BY
14     c.customer_id, c.customer_name, c.c_phone, o.order_date
15 HAVING
16     SUM(o.total_amount) > 200;
```

customer_id	customer_name	c_phone	order_date	total_amount
2	Selin	05431234567	2025-01-02	201
5	Bora	05337894567	2025-01-05	225
7	Engin	05329876543	2025-01-07	300
10	Esra	05434567890	2025-01-10	251
11	Furkan	05355678912	2025-01-11	310
12	Cansu	05461234567	2025-01-12	400
15	Kaan	05394567891	2025-01-15	275
18	Sinem	05492345678	2025-01-18	325
19	Hakan	05381234567	2025-01-19	211

Print the amounts, IDs and dates of failed payments. What is the total amount of failed payments?

```
1 SELECT
2     O.order_date AS Order_Date,
3     O.order_id AS Order_ID,
4     O.total_amount AS Total_Amount
5 FROM
6     Orders O
7 WHERE
8     O.payment_status = 'Failed';
9
10 SELECT
11     SUM(O.total_amount) AS Total_Failed_Amount
12 FROM
13     Orders O
14 WHERE
15     O.payment_status = 'Failed';
```

		Order_Date	Order_ID	Total_Amount
<input type="checkbox"/>	Edit Copy Delete	2025-01-04	4	175
<input type="checkbox"/>	Edit Copy Delete	2025-01-08	8	95
<input type="checkbox"/>	Edit Copy Delete	2025-01-12	12	400
<input type="checkbox"/>	Edit Copy Delete	2025-01-15	15	275
<input type="checkbox"/>	Edit Copy Delete	2025-01-19	19	211

Total_Failed_Amount

1156

Give all the information, the order id, customer id, order date, total amount of order and payment id, of the orders that are paid ?

```
1 SELECT * FROM `Orders`  
2 WHERE payment_status = "paid";
```

	order_id	customer_id	order_date	total_amount	payment_status	payment_id
<input type="checkbox"/>  Edit  Copy  Delete	1	1	2025-01-01	101	Paid	1
<input type="checkbox"/>  Edit  Copy  Delete	3	3	2025-01-03	150	Paid	3
<input type="checkbox"/>  Edit  Copy  Delete	5	5	2025-01-05	225	Paid	5
<input type="checkbox"/>  Edit  Copy  Delete	7	7	2025-01-07	300	Paid	7
<input type="checkbox"/>  Edit  Copy  Delete	9	9	2025-01-09	121	Paid	9
<input type="checkbox"/>  Edit  Copy  Delete	11	11	2025-01-11	310	Paid	11
<input type="checkbox"/>  Edit  Copy  Delete	14	14	2025-01-14	181	Paid	14
<input type="checkbox"/>  Edit  Copy  Delete	16	16	2025-01-16	96	Paid	16
<input type="checkbox"/>  Edit  Copy  Delete	18	18	2025-01-18	325	Paid	18
<input type="checkbox"/>  Edit  Copy  Delete	20	20	2025-01-20	100	Paid	20

PRODUCT SCHEMA

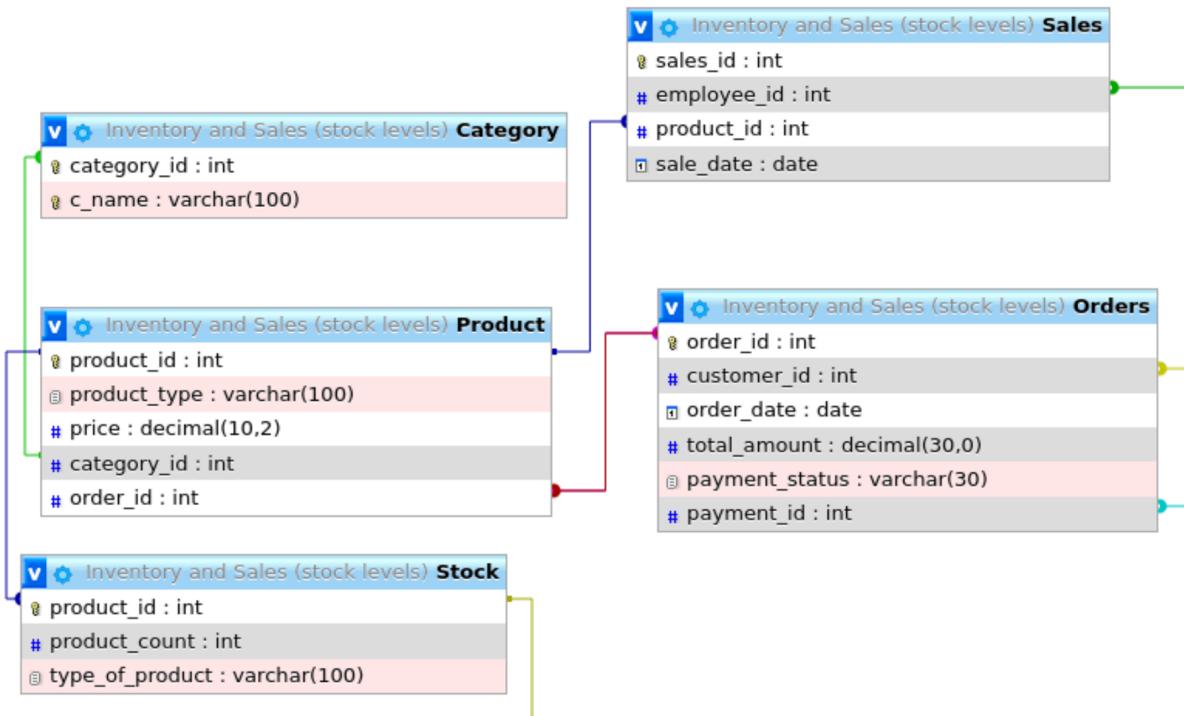
#	Name	Type	Collation	Attributes	Null	Default
1	product_id 	int			No	None
2	product_type	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL
3	price	decimal(10,2)			Yes	NULL
4	category_id 	int			No	None
5	order_id 	int			No	None

This entity, Product, involves some general information about the products such as: id numbers of product (**product_id**) which is primary key for this table, type of the product (**product_type**), price of the product (**price**), id of the category which is one of the foreign key for this table which is preferences from category table, and lastly id of the order (**order_id**) which is one of the foreign key for this table which is preferences from order table.

PRODUCT TABLE

	  	product_id	product_type	price	category_id	order_id
	  	1	Laptop	5000.00	2	1
	  	2	Phone	3000.00	1	2
	  	3	Headphones	500.00	3	3
	  	4	Monitor	1500.00	4	4
	  	5	Keyboard	200.00	4	5
	  	6	Mouse	100.00	4	6
	  	7	Tablet	2000.00	1	7
	  	8	Smartwatch	1500.00	3	8
	  	9	Speaker	800.00	5	9
	  	10	Printer	1200.00	6	10
	  	11	Router	400.00	6	11
	  	12	Hard Drive	800.00	4	12
	  	13	Camera	3000.00	5	13
	  	14	Microphone	600.00	5	14
	  	15	Projector	4500.00	6	15
	  	16	Air Conditioner	8000.00	7	16
	  	17	Computer Cooler	2000.00	4	17
	  	18	Heater	3000.00	7	18
	  	19	Vacuum Cleaner	2500.00	7	19
	  	20	Washing Machine	7500.00	7	20

RELATION SCHEMA



This schema is a relational schema. In here `product_id` is the foreign key that is referenced to the **Stock**, the `category_id` is the foreign key that is referred to the **Category**, the `product_id` is the foreign key that is referred to the **Sales**. Lastly, the `order_id` is the foreign key that is referred to the **Order**. The relation between the schemas are shown above.

QUERIES

Which products belong to the Home category (category id 7)?

```
1 SELECT product_id, category_id
2 FROM Product
3 WHERE category_id = 7;
```

		product_id	category_id
<input type="checkbox"/>	Edit Copy Delete	16	7
<input type="checkbox"/>	Edit Copy Delete	18	7
<input type="checkbox"/>	Edit Copy Delete	19	7
<input type="checkbox"/>	Edit Copy Delete	20	7

Which products have a price equal to or greater than 1500 units?

```
1 SELECT product_id, price
2 FROM Product
3 WHERE price >= 1500;
4
```

			product_id	price				
<input type="checkbox"/>		Edit		Copy		Delete	1	5000.00
<input type="checkbox"/>		Edit		Copy		Delete	2	3000.00
<input type="checkbox"/>		Edit		Copy		Delete	4	1500.00
<input type="checkbox"/>		Edit		Copy		Delete	7	2000.00
<input type="checkbox"/>		Edit		Copy		Delete	8	1500.00
<input type="checkbox"/>		Edit		Copy		Delete	13	3000.00
<input type="checkbox"/>		Edit		Copy		Delete	15	4500.00
<input type="checkbox"/>		Edit		Copy		Delete	16	8000.00
<input type="checkbox"/>		Edit		Copy		Delete	17	2000.00
<input type="checkbox"/>		Edit		Copy		Delete	18	3000.00
<input type="checkbox"/>		Edit		Copy		Delete	19	2500.00
<input type="checkbox"/>		Edit		Copy		Delete	20	7500.00

SALES SCHEMA

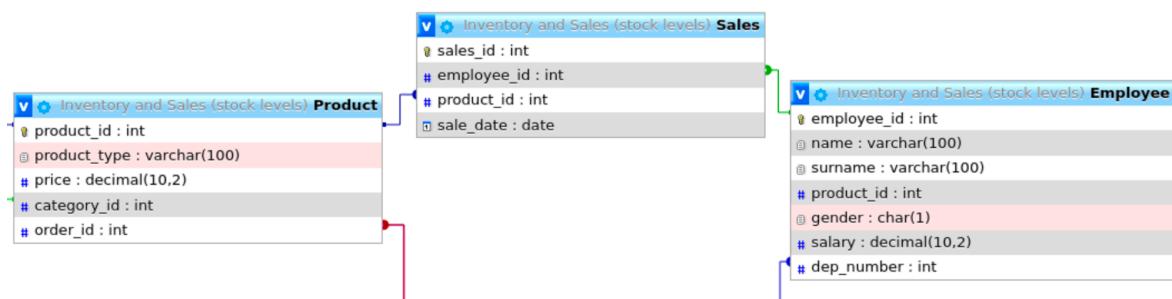
#	Name	Type	Collation	Attributes	Null	Default
<input type="checkbox"/>	1 sales_id	int			No	None
<input type="checkbox"/>	2 employee_id	int			No	None
<input type="checkbox"/>	3 product_id	int			No	None
<input type="checkbox"/>	4 sale_date	date			No	None

This entity, Sales, involves some general information about the sales such as: id numbers of sales (**sales_id**) which is primary key for this table, id of the employee (**employee_id**) which is one of the foreign key for this table which is preferences from employee table, id of the product (**product_id**) which is one of the foreign key for this table which is preferences from category table and lastly date of the sales (**sale_date**)

SALES TABLE

		sales_id	employee_id	product_id	sale_date
<input type="checkbox"/>	Edit Copy Delete	1	1	1	2025-01-01
<input type="checkbox"/>	Edit Copy Delete	2	2	2	2025-01-02
<input type="checkbox"/>	Edit Copy Delete	3	3	3	2025-01-03
<input type="checkbox"/>	Edit Copy Delete	4	4	4	2025-01-04
<input type="checkbox"/>	Edit Copy Delete	5	5	5	2025-01-05
<input type="checkbox"/>	Edit Copy Delete	6	6	6	2025-01-06
<input type="checkbox"/>	Edit Copy Delete	7	7	7	2025-01-07
<input type="checkbox"/>	Edit Copy Delete	8	8	8	2025-01-08
<input type="checkbox"/>	Edit Copy Delete	9	9	9	2025-01-09
<input type="checkbox"/>	Edit Copy Delete	10	10	10	2025-01-10
<input type="checkbox"/>	Edit Copy Delete	11	11	11	2025-01-11
<input type="checkbox"/>	Edit Copy Delete	12	12	12	2025-01-12
<input type="checkbox"/>	Edit Copy Delete	13	13	13	2025-01-13
<input type="checkbox"/>	Edit Copy Delete	14	14	14	2025-01-14
<input type="checkbox"/>	Edit Copy Delete	15	15	15	2025-01-15
<input type="checkbox"/>	Edit Copy Delete	16	16	16	2025-01-16
<input type="checkbox"/>	Edit Copy Delete	17	17	17	2025-01-17
<input type="checkbox"/>	Edit Copy Delete	18	18	18	2025-01-18
<input type="checkbox"/>	Edit Copy Delete	19	19	19	2025-01-19
<input type="checkbox"/>	Edit Copy Delete	20	20	20	2025-01-20

RELATION SCHEMA



This schema is a relational schema. In here product_id is the foreign key that is referenced to the **Product**, the employee_id is the foreign key that is referred to the **Employee**. The relation between the schemas are shown above.

QUERIES

What are the sales completed after January 25, 2025?

```
1 SELECT sales_id, sale_date  
2 FROM Sales  
3 WHERE sale_date > '2025-01-12';  
4
```

			sales_id	sale_date
← T →		▼		
<input type="checkbox"/>	 Edit	 Copy	 Delete	13 2025-01-13
<input type="checkbox"/>	 Edit	 Copy	 Delete	14 2025-01-14
<input type="checkbox"/>	 Edit	 Copy	 Delete	15 2025-01-15
<input type="checkbox"/>	 Edit	 Copy	 Delete	16 2025-01-16
<input type="checkbox"/>	 Edit	 Copy	 Delete	17 2025-01-17
<input type="checkbox"/>	 Edit	 Copy	 Delete	18 2025-01-18
<input type="checkbox"/>	 Edit	 Copy	 Delete	19 2025-01-19
<input type="checkbox"/>	 Edit	 Copy	 Delete	20 2025-01-20

What are the sale IDs of category ID 5, which is 'Others'?

```
1 SELECT Sales.sales_id, Product.product_id, Product.category_id
2 FROM Sales
3 JOIN Product ON Sales.product_id = Product.product_id
4 WHERE Product.category_id = 5;
5
6 |
```

sales_id	product_id	category_id
9	9	5
13	13	5
14	14	5

What are the ID and date of the sale for the monitor?

```
1 SELECT Sales.sales_id, Sales.sale_date, Product.product_id, Product.product_type
2 FROM Sales
3 JOIN Product ON Sales.product_id = Product.product_id
4 WHERE Product.product_type = 'Monitor';
5 |
```

sales_id	sale_date	product_id	product_type
4	2025-01-04	4	Monitor

STOCK SCHEMA

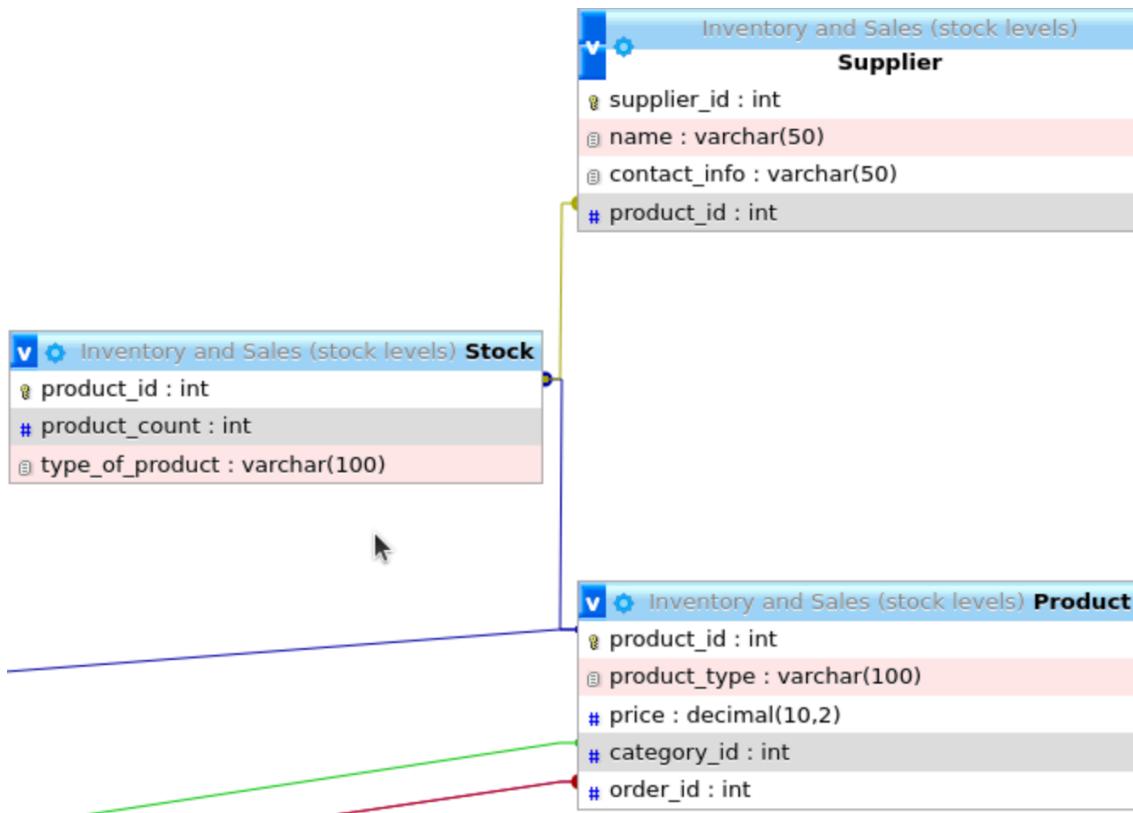
#	Name	Type	Collation	Attributes	Null	Default
1	product_id	int			No	None
2	product_count	int			Yes	NULL
3	type_of_product	varchar(100)	utf8mb4_0900_ai_ci		Yes	NULL

This entity, Stock, involves some general information about the products such as: id numbers of product(**product_id**) which is primary key for this table, product count(**product_count**) which is foreign key for this table which is preferences from product table, and lastly type of product (**type_of_product**).

STOCK TABLE

		product_id	product_count	type_of_product
	Edit Copy Delete 1	50	Laptop	
	Edit Copy Delete 2	30	Phone	
	Edit Copy Delete 3	100	Headphones	
	Edit Copy Delete 4	75	Monitor	
	Edit Copy Delete 5	40	Keyboard	
	Edit Copy Delete 6	60	Mouse	
	Edit Copy Delete 7	90	Tablet	
	Edit Copy Delete 8	120	Smartwatch	
	Edit Copy Delete 9	110	Speaker	
	Edit Copy Delete 10	150	Printer	
	Edit Copy Delete 11	80	Router	
	Edit Copy Delete 12	65	Hard Drive	
	Edit Copy Delete 13	55	Camera	
	Edit Copy Delete 14	25	Microphone	
	Edit Copy Delete 15	100	Projector	
	Edit Copy Delete 16	70	Air Conditioner	
	Edit Copy Delete 17	200	Fan	
	Edit Copy Delete 18	150	Heater	
	Edit Copy Delete 19	90	Vacuum Cleaner	
	Edit Copy Delete 20	110	Washing Machine	
	<input checked="" type="checkbox"/> Console			

RELATION SCHEMA



This is a relational table where stocks, suppliers and products are represented as distinct entities, interconnected through relationships. The relationship is established via the **product_id**, which serves as the primary key in the **Products** table and as a foreign key in the related tables.

QUERIES

- Which four products have the highest stock quantities?

```
1 | SELECT type_of_product, product_count
2 | FROM Stock
3 | ORDER BY product_count DESC
4 | LIMIT 4;
5 |
```

	type_of_product	product_count
<input type="checkbox"/>  Edit  Copy  Delete	Fan	200
<input type="checkbox"/>  Edit  Copy  Delete	Heater	150
<input type="checkbox"/>  Edit  Copy  Delete	Printer	150
<input type="checkbox"/>  Edit  Copy  Delete	Smartwatch	120

- Which product types have an average quantity greater than 100?

```
1 | SELECT type_of_product|
2 | FROM Stock
3 | GROUP BY type_of_product
4 | HAVING AVG(product_count) > 100;
5 |
```

	type_of_product
<input type="checkbox"/>  Edit  Copy  Delete	Smartwatch
<input type="checkbox"/>  Edit  Copy  Delete	Speaker
<input type="checkbox"/>  Edit  Copy  Delete	Printer
<input type="checkbox"/>  Edit  Copy  Delete	Fan
<input type="checkbox"/>  Edit  Copy  Delete	Heater
<input type="checkbox"/>  Edit  Copy  Delete	Washing Machine

SUPPLIER SCHEMA

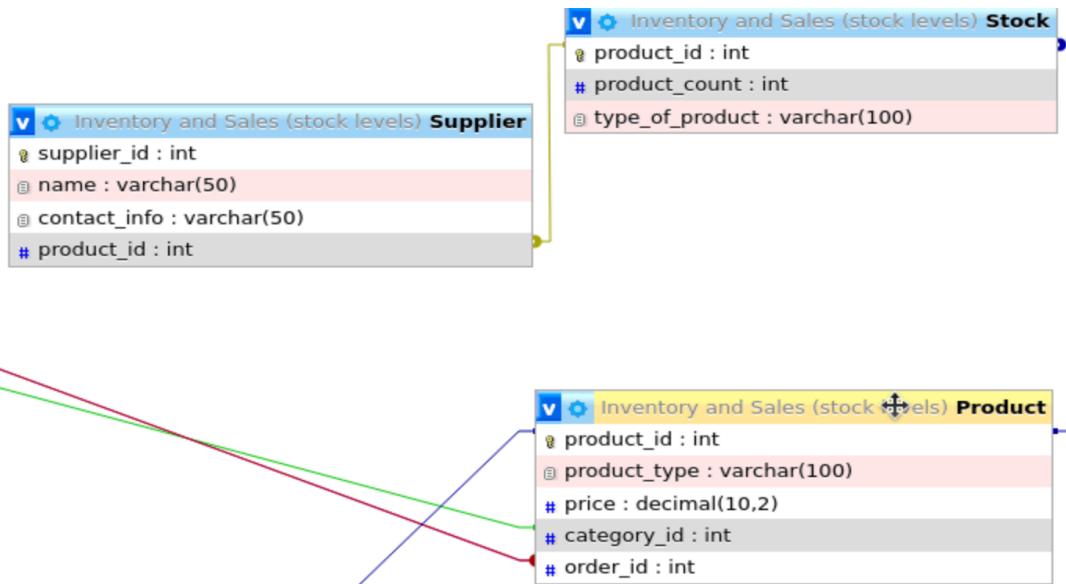
#	Name	Type	Collation	Attributes	Null	Default
1	supplier_id 	int			No	<i>None</i>
2	name	varchar(50)	utf8mb4_0900_ai_ci		No	<i>None</i>
3	contact_info	varchar(50)	utf8mb4_0900_ai_ci		No	<i>None</i>
4	product_id 	int			No	<i>None</i>

This entity, Supplier, involves some general information about the supplier such as: id numbers of supplier(**supplier_id**) which is primary key for this table, name of the supplier(**name**), contact information of suppliers (**contact_info**), and id numbers of product (**product_id**) which is foreign key for this table which is preferences from product table.

SUPPLIER TABLE

	 Edit	 Copy	 Delete	supplier_id	name	contact_info	product_id
				1	Supplier 1	contact1@supplier.com	1
				2	Supplier 2	contact2@supplier.com	2
				3	Supplier 3	contact3@supplier.com	3
				4	Supplier 4	contact4@supplier.com	4
				5	Supplier 5	contact5@supplier.com	5
				6	Supplier 6	contact6@supplier.com	6
				7	Supplier 7	contact7@supplier.com	7
				8	Supplier 8	contact8@supplier.com	8
				9	Supplier 9	contact9@supplier.com	9
				10	Supplier 10	contact10@supplier.com	10
				11	Supplier 11	contact11@supplier.com	11
				12	Supplier 12	contact12@supplier.com	12
				13	Supplier 13	contact13@supplier.com	13
				14	Supplier 14	contact14@supplier.com	14
				15	Supplier 15	contact15@supplier.com	15
				16	Supplier 16	contact16@supplier.com	16
				17	Supplier 17	contact17@supplier.com	17
				18	Supplier 18	contact18@supplier.com	18
				19	Supplier 19	contact19@supplier.com	19
				20	Supplier 20	contact20@supplier.com	20

RELATION SCHEMA



This is a relational table where suppliers, stocks, and products are represented as distinct entities, interconnected through relationships. The relationship is established via the **product_id**, which serves as the **primary key** in the Products table and as a foreign key in the related tables.

QUERIES

- What are the IDs of the suppliers providing the four products with the highest stock quantities?

```
1 SELECT s.product_id, s.supplier_id, st.product_count
2 FROM Stock st
3 JOIN Supplier s ON st.product_id = s.product_id
4 ORDER BY st.product_count DESC
5 LIMIT 4;
6 |
```

OUTPUT

product_id	supplier_id	product_count
17	17	200
18	18	150
10	10	150
8	8	120

- What are the contact details of the suppliers providing the product with the lowest stock quantity?

```
1 SELECT s.contact_info
2 FROM Supplier s
3 JOIN Stock st ON s.product_id= st.product_id
4 WHERE st.product_count = (
5     SELECT MIN(product_count)
6     FROM Stock
```

OUTPUT

contact_info
contact14@supplier.com

- Could you order the product types by their count, from highest to lowest?

```
1 SELECT type_of_product,product_count
2 FROM Stock
3 ORDER BY product_count ASC;
4
```

OUTPUT

	type_of_product	product_count
<input type="checkbox"/> Edit Copy Delete	Microphone	25
<input type="checkbox"/> Edit Copy Delete	Phone	30
<input type="checkbox"/> Edit Copy Delete	Keyboard	40
<input type="checkbox"/> Edit Copy Delete	Laptop	50
<input type="checkbox"/> Edit Copy Delete	Camera	55
<input type="checkbox"/> Edit Copy Delete	Mouse	60
<input type="checkbox"/> Edit Copy Delete	Hard Drive	65
<input type="checkbox"/> Edit Copy Delete	Air Conditioner	70
<input type="checkbox"/> Edit Copy Delete	Monitor	75
<input type="checkbox"/> Edit Copy Delete	Router	80

CATEGORY SCHEMA

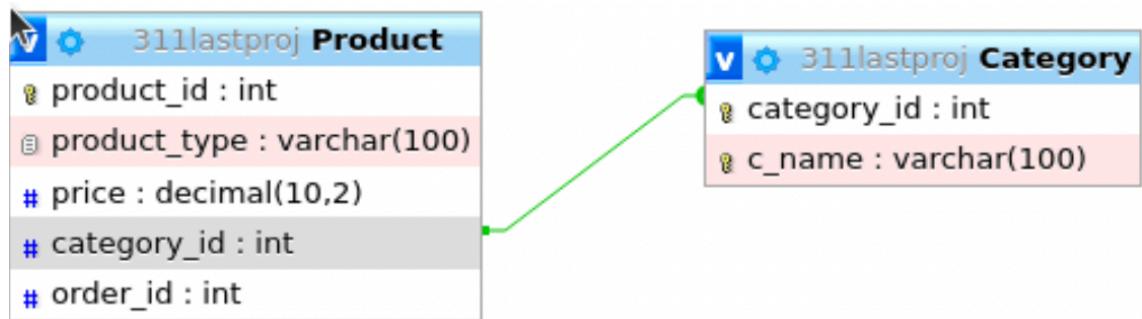
#	Name	Type	Collation	Attributes	Null	Default
1	category_id	int			No	None
2	c_name	varchar(100)	utf8mb4_0900_ai_ci		No	None

This entity, Category , involves some general information about the categories of the products such as: id numbers of category(**category_id**) which is primary key for this table, name of the categories (**c_name**) for this table

CATEGORY TABLE

			category_id	c_name	
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	Accessories
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	Computer
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	Hardware
<input type="checkbox"/>	 Edit	 Copy	 Delete	7	Home
<input type="checkbox"/>	 Edit	 Copy	 Delete	6	Office
<input type="checkbox"/>	 Edit	 Copy	 Delete	5	Others
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	Phone

RELATION SCHEMA



QUERIES

- Which categories have the most orders?

```
1 | SELECT DISTINCT c_name  
2 | FROM Category;
```

OUTPUT

Category	OrderCount	1
Hardware	5	
Home	4	
Office	3	
Others	3	
Accessories	2	
Computer	2	
Phone	1	

- Which category did customers spend the most money by credit card on and how much?

```
SELECT c.c_name AS category_name,
       SUM(p.price) AS total_amount
  FROM Product p
 JOIN Category c ON p.category_id = c.category_id
 JOIN Payment pay ON p.order_id = pay.order_id
 WHERE pay.payment_method = 'Credit Card'
 GROUP BY c.c_name
 ORDER BY total_amount DESC
 LIMIT 1;
```

OUTPUT

category_name	total_amount
Phone	5000.00

- Which category of products did customers spend the most money on by credit and how much?

```

SELECT
    c.c_name AS category_name,
    SUM(p.price) AS total_amount
FROM
    Product p
JOIN
    Category c ON p.category_id = c.category_id
JOIN
    Payment pay ON p.order_id = pay.order_id
WHERE
    pay.payment_method = 'Credit Card'
GROUP BY
    c.c_name
ORDER BY
    total_amount DESC
LIMIT 1;

```

OUTPUT

category_name	total_amount
Phone	5000.00

PAYMENT SCHEMA

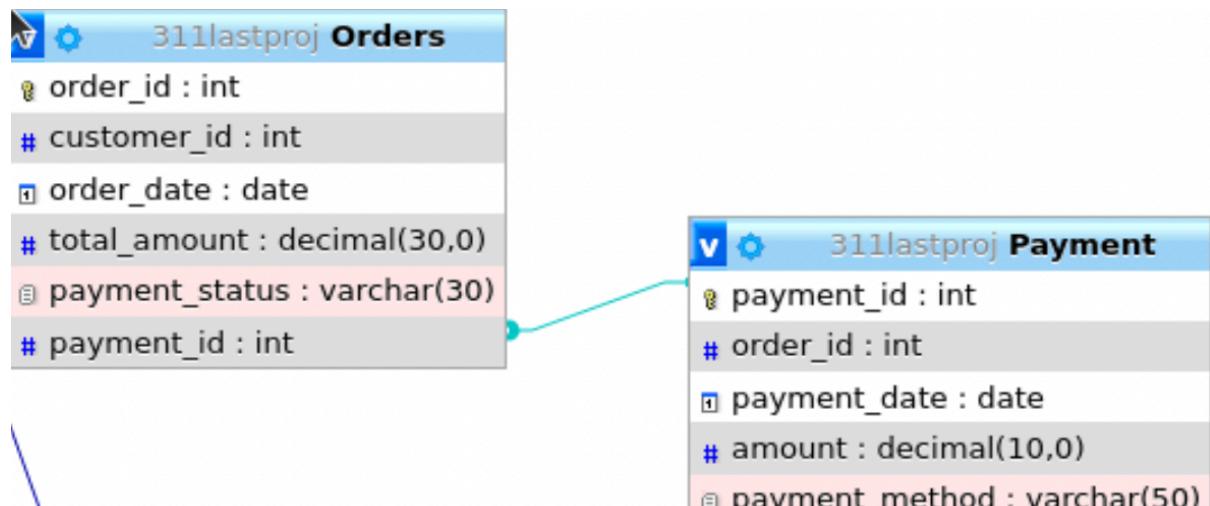
	#	Name	Type	Collation	Attributes	Null	Default
<input type="checkbox"/>	1	payment_id	int		No	None	
<input type="checkbox"/>	2	order_id	int		No	None	
<input type="checkbox"/>	3	payment_date	date		No	None	
<input type="checkbox"/>	4	amount	decimal(10,0)		No	None	
<input type="checkbox"/>	5	payment_method	varchar(50)	utf8mb4_0900_ai_ci	No	None	

This entity, Payment , involves some general information about the Payments of the customers such as: id numbers of payment(**payment_id**) which is primary key for this table, date of the payments (**payment_date**), amount of payments(**amount**), method of the payment (**payment_method**) , and id numbers of orders (**order_id**) which is a foreign key for this table .

PAYMENT TABLE

		payment_id	order_id	payment_date	amount	payment_method	
<input type="checkbox"/>	Edit	Copy	Delete	1	2025-01-01	2	Credit Card
<input type="checkbox"/>	Edit	Copy	Delete	2	2025-01-02	1	PayPal
<input type="checkbox"/>	Edit	Copy	Delete	3	2025-01-03	3	Debit Card
<input type="checkbox"/>	Edit	Copy	Delete	4	2025-01-04	4	Cash
<input type="checkbox"/>	Edit	Copy	Delete	5	2025-01-05	4	Credit Card
<input type="checkbox"/>	Edit	Copy	Delete	6	2025-01-06	6	PayPal
<input type="checkbox"/>	Edit	Copy	Delete	7	2025-01-07	2	Debit Card
<input type="checkbox"/>	Edit	Copy	Delete	8	2025-01-08	3	Cash
<input type="checkbox"/>	Edit	Copy	Delete	9	2025-01-09	8	Credit Card
<input type="checkbox"/>	Edit	Copy	Delete	10	2025-01-10	2	PayPal
<input type="checkbox"/>	Edit	Copy	Delete	11	2025-01-11	1	Debit Card
<input type="checkbox"/>	Edit	Copy	Delete	12	2025-01-12	6	Cash
<input type="checkbox"/>	Edit	Copy	Delete	13	2025-01-13	3	Credit Card
<input type="checkbox"/>	Edit	Copy	Delete	14	2025-01-14	5	PayPal
<input type="checkbox"/>	Edit	Copy	Delete	15	2025-01-15	2	Debit Card
<input type="checkbox"/>	Edit	Copy	Delete	16	2025-01-16	1	Cash
<input type="checkbox"/>	Edit	Copy	Delete	17	2025-01-17	7	Credit Card
<input type="checkbox"/>	Edit	Copy	Delete	18	2025-01-18	4	PayPal
<input type="checkbox"/>	Edit	Copy	Delete	19	2025-01-19	6	Debit Card
<input type="checkbox"/>	Edit	Copy	Delete	20	2025-01-20	2	Cash

RELATION SCHEMA



QUERIES

- What is the most used payment_method that customers use?

```
SELECT
    payment_method,
    COUNT(payment_id) AS UsageCount
FROM
    Payment
GROUP BY
    payment_method
ORDER BY
    UsageCount DESC
LIMIT 1;
```

OUTPUT

payment_method	UsageCount
Credit Card	5

- What are the names, phone numbers and genders of the people who pay by paypal and pay after 5 January?

```
1 SELECT
2     customer_name AS Name,
3     c_phone AS Phone,
4     c_gender AS Gender
5 FROM
6     Customer c
7 JOIN
8     Orders o ON c.customer_id = o.customer_id
9 JOIN
10    Payment p ON o.order_id = p.order_id
11 WHERE
12    p.payment_method = 'PayPal'
13    AND o.order_date > '2024-01-05';
14
```

OUTPUT

Name	Phone	Gender
Selin	05431234567	F
Dilara	05456789012	F
Esra	05434567890	F
Zehra	05472345678	F
Sinem	05492345678	F

Division Of Labor

In our report, the following entities were individually created, data entered, SQL queries written, tables obtained, etc. The entire project was carried out in joint work in all parts other than these.

Arda Palit : ORDER, CUSTOMER

Batuhan Kalaycı : EMPLOYEE, DEPARTMENT

Gürdal Safel : PRODUCT, SALES

Rubar Akyıldız : CATEGORY, PAYMENT

Tuğana Akın : SUPPLY, STOCK