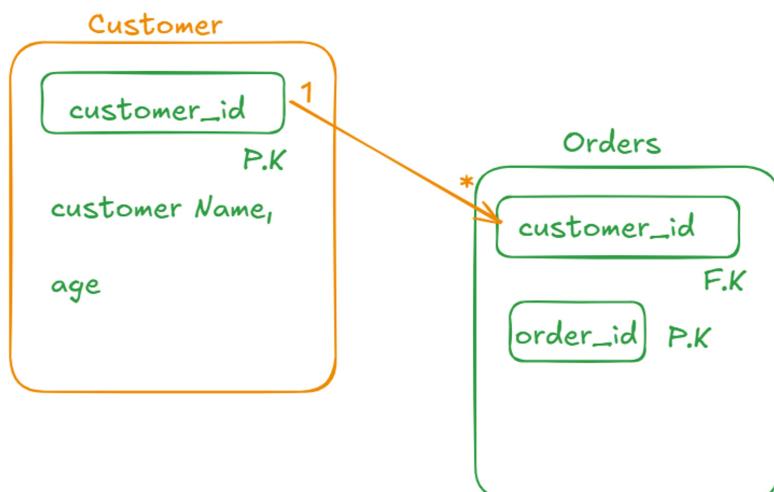


Introduction to Joins

```

calendar
customerdetails
customers
product-categories
product-subcategories
products
returns
sales-2015
sales-2016
sales-2017
territories

```



```

mysql> CREATE TABLE Customer(
    -> Customer_id INT NOT NULL,
    -> Customer_name VARCHAR(100) NOT NULL,
    -> age int
    -> );
Query OK, 0 rows affected (0.10 sec)

mysql> DESC Customer;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Customer_id | int | NO | YES | NULL | |
| Customer_name | varchar(100) | NO | NO | NULL | |
| age | int | YES | NO | NULL | |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> INSERT INTO Customer(customer_id , age)
-> VALUES(1,29);
ERROR 1364 (HY000): Field 'Customer_name' doesn't have a default value

```

- 1, Abhishek Behal, 30
- 2, Priya Sharma, 28
- 3, Rohan Mehta, 35
- 4, Neha Kapoor, 26
- 5, Arjun Singh, 40
- 6, Kavita Reddy, 31
- 7, Mohit Verma, 29
- 8, Sneha Iyer, 33
- 9, Rahul Sinha, 38
- 10, Meera Nair, 27

```

mysql> ALTER TABLE Customer
-> MODIFY Customer_name varchar(100) DEFAULT 'Unknown';
Query OK, 0 rows affected (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> DESC Customer;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Customer_id | int | NO | | NULL |
| Customer_name | varchar(100) | YES | | Unknown |
| age | int | YES | | NULL |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> INSERT INTO Customer(customer_id , age)
-> VALUES(1,29);
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM Customer;
+-----+-----+-----+
| Customer_id | Customer_name | age |
+-----+-----+-----+
| 1 | Unknown | 29 |
+-----+-----+-----+
1 row in set (0.00 sec)

```

```

mysql> ALTER TABLE Customer
-> MODIFY Customer_name varchar(100) NOT NULL DEFAULT 'Unknown';
Query OK, 0 rows affected (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> DESC Customer;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Customer_id | int | NO | | NULL |
| Customer_name | varchar(100) | NO | | Unknown |
| age | int | YES | | NULL |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> INSERT INTO Customer(customer_id , age)
-> VALUES(2,30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM Customer;
+-----+-----+-----+
| Customer_id | Customer_name | age |
+-----+-----+-----+
| 1 | Unknown | 29 |
| 2 | Unknown | 30 |
+-----+-----+-----+
2 rows in set (0.00 sec)

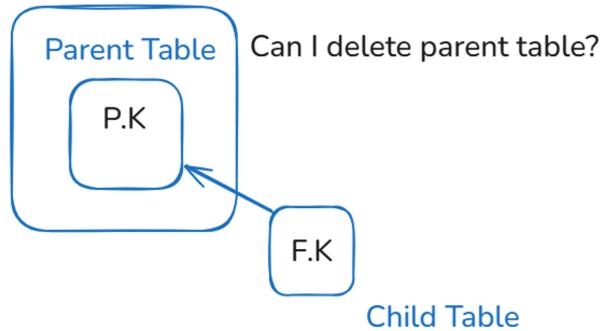
```

```

mysql> ALTER TABLE Customer
-> ADD PRIMARY KEY(customer_id);
Query OK, 0 rows affected (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> DESC Customer;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Customer_id | int | NO | PRI | NULL |
| Customer_name | varchar(100) | NO | | Unknown |
| age | int | YES | | NULL |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

```

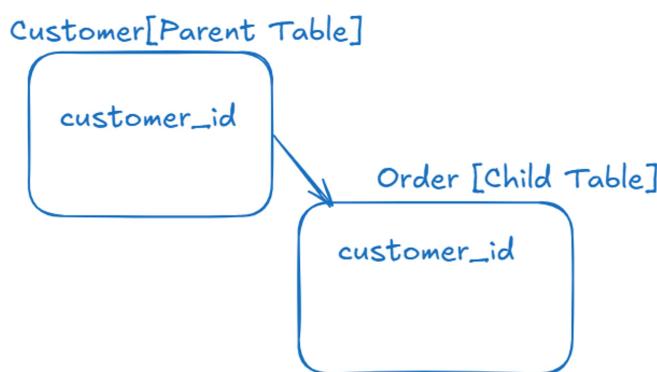


ACTION[Delete/Update{Parent Table}] -> Cascade, SET NULL, SET DEFAULT, RESTRICT / NO ACTION

```
mysql> CREATE TABLE Orders(
    ->   order_id INT PRIMARY KEY,
    ->   customer_id INT,
    ->       FOREIGN KEY(customer_id) REFERENCES Customer(Customer_id)
    -> );
Query OK, 0 rows affected (0.11 sec)

mysql> DESC orders;
+-----+-----+-----+-----+-----+
| Field      | Type   | Null  | Key   | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id   | int    | NO    | PRI   | NULL    |        |
| customer_id | int    | YES   | MUL   | NULL    |        |
+-----+-----+-----+-----+-----+
2 rows in set (0.02 sec)
```

```
-- Order Table
CREATE TABLE Orders(
    order_id INT PRIMARY KEY,
    customer_id INT,
    FOREIGN KEY(customer_id) REFERENCES Customer(Customer_id)
);
```



Constraints

1. NOT NULL

```
mysql> ALTER TABLE Customer
-> MODIFY age int NOT NULL;
Query OK, 0 rows affected (0.08 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> DESC Customer;
+-----+-----+-----+-----+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Customer_id | int        | NO   | PRI | NULL    |          |
| Customer_name | varchar(100) | NO   |     | Unknown |          |
| age         | int        | NO   |     | NULL    |          |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

2. UNIQUE

```
mysql> DESC Employees;
+-----+-----+-----+-----+-----+
| Field      | Type       | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| EmployeeID | int        | NO   | PRI | NULL    | auto_increment |
| FirstName   | varchar(50) | NO   |     | NULL    |          |
| LastName    | varchar(50) | NO   |     | NULL    |          |
| Email       | varchar(100) | NO   | UNI | NULL    |          |
| Salary      | decimal(10,2) | YES  |     | NULL    |          |
| BirthDate   | date       | NO   |     | NULL    |          |
| Gender      | char(1)    | YES  |     | NULL    |          |
| Active      | tinyint(1) | YES  |     | 1       |          |
+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)
```

```
-- 3. PRIMARY KEY
-- ALTER TABLE Customer
-- ADD PRIMARY KEY(customer_id);
```

4. Foreign Key

```
CREATE TABLE Orders(
    order_id INT PRIMARY KEY,
    customer_id INT,
    FOREIGN KEY(customer_id) REFERENCES Customer(Customer_id)
);
```

Let's drop the Customer_id from Orders Table. And recreate everything with alter command.

```
mysql> DESC orders;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | NO | PRI | NULL |
| customer_id | int | YES | MUL | NULL |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> DROP TABLE Orders;
Query OK, 0 rows affected (0.01 sec)

mysql> SHOW TABLES;
+-----+
| Tables_in_sales_db |
+-----+
| calendar
| customer
| customerdetails
| customers
| product-categories
| product-subcategories
| products
| returns
| sales-2015
| sales-2016
| sales-2017
| territories
+-----+
12 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE Orders(
    -> order_id INT PRIMARY KEY
    -> );
Query OK, 0 rows affected (0.02 sec)

mysql> DESC Orders;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | NO | PRI | NULL |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> ALTER TABLE Orders
    -> ADD COLUMN customer_id INT;
Query OK, 0 rows affected (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```

mysql> DESC Orders;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | NO | PRI | NULL |
| customer_id | int | YES | MUL | NULL |
+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> ALTER TABLE orders
    -> ADD CONSTRAINT fk_customer_id
        -> FOREIGN KEY(customer_id) REFERENCES Customer(Customer_id);
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql>
mysql> DESC Orders;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | NO | PRI | NULL |
| customer_id | int | YES | MUL | NULL |
+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

```

```

mysql> DESC Returns;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| ReturnDate | text | YES | | NULL |
| TerritoryKey | int | YES | | NULL |
| ProductKey | int | YES | | NULL |
| ReturnQuantity | int | YES | | NULL |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

```

Still Think of?

Can we create/Alter the existing column with Foreign Key.

```

mysql> ALTER TABLE Orders
    -> DROP FOREIGN KEY fk_customer_id;
Query OK, 0 rows affected (0.01 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE Orders
    -> DROP COLUMN customer_id;
Query OK, 0 rows affected (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 0

```

```

mysql> DESC Orders;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| order_id | int | NO | PRI | NULL |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

```

CHECK CONSTRAINT

```
mysql> DESC Customer;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Customer_id | int | NO | PRI | NULL |
| Customer_name | varchar(100) | NO | | Unknown |
| age | int | NO | | NULL |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> SELECT * FROM Customer;
+-----+-----+-----+
| Customer_id | Customer_name | age |
+-----+-----+-----+
| 1 | Unknown | 29 |
| 2 | Unknown | 30 |
+-----+-----+-----+
```

```
mysql> ALTER TABLE Customer
    -> ADD CONSTRAINT check_age CHECK(age>=18);
Query OK, 2 rows affected (0.06 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Customer;
+-----+-----+-----+
| Customer_id | Customer_name | age |
+-----+-----+-----+
| 1 | Unknown | 29 |
| 2 | Unknown | 30 |
+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> INSERT INTO Customer
    -> VALUES(3,"Naveen",16);
ERROR 3819 (HY000): Check constraint 'check_age' is violated.
```

```
mysql> DESC Returns;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| ReturnDate | text | YES | | NULL |
| TerritoryKey | int | YES | | NULL |
| ProductKey | int | YES | | NULL |
| ReturnQuantity | int | YES | | NULL |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
-- Making a duplicate of Returns
```

```
CREATE TABLE returns2
```

```
AS (SELECT * FROM returns);
```

```
mysql> DESC returns2;
```

Field	Type	Null	Key	Default	Extra
ReturnDate	text	YES		NULL	
TerritoryKey	int	YES		NULL	
ProductKey	int	YES		NULL	
ReturnQuantity	int	YES		NULL	

```
4 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE returns2
```

```
    -> ADD CONSTRAINT return_quantity_is_negative CHECK(ReturnQuantity > 0);
```

```
Query OK, 1809 rows affected (0.06 sec)
```

```
Records: 1809  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO returns2(ReturnQuantity)
```

```
    -> VALUE(-5);
```

```
ERROR 3819 (HY000): Check constraint 'return_quantity_is_negative' is violated.
```

```
ALTER TABLE returns2
```

```
ADD CONSTRAINT return_quantity_is_negative CHECK(ReturnQuantity > 0);
```

```
INSERT INTO returns2(ReturnQuantity)
```

```
VALUE(-5);
```

```
ALTER TABLE Customers
```

```
ADD CONSTRAINT check_gender CHECK (Gender IN ('M','F'));
```

```
mysql> DESC returns2;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ReturnDate | text | YES | | NULL | |
| TerritoryKey | int | YES | | NULL | |
| ProductKey | int | YES | | NULL | |
| ReturnQuantity | int | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
F
. Make this TerritoryKey a foreign key
NA
```

```
mysql> DESC territory;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| SalesTerritoryKey | int | YES | | NULL | |
| Region | text | YES | | NULL | |
| Country | text | YES | | NULL | |
| Continent | text | YES | | NULL | |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE territory
-> ADD PRIMARY KEY(SalesTerritoryKey);
Query OK, 0 rows affected (0.06 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> DESC territory;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| SalesTerritoryKey | int | NO | PRI | NULL | |
| Region | text | YES | | NULL | |
| Country | text | YES | | NULL | |
| Continent | text | YES | | NULL | |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE returns2
-> ADD CONSTRAINT fk_territory_key
-> FOREIGN KEY(TerritoryKey) REFERENCES territory(SalesTerritoryKey);
Query OK, 1809 rows affected (0.08 sec)
Records: 1809 Duplicates: 0 Warnings: 0
```

```
mysql> DESC Returns2;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ReturnDate | text | YES | | NULL | |
| TerritoryKey | int | YES | MUL | NULL | |
| ProductKey | int | YES | | NULL | |
| ReturnQuantity | int | YES | | NULL | |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Entity - Relationship Diagram

```
mysql> SHOW TABLES;
+-----+
| Tables_in_sales_db |
+-----+
| calendar           |
| customer            |
| customerdetails    |
| customers           |
| orders              |
| product-categories |
| product-subcategories |
| products             |
| returns              |
| returns2             |
| sales-2015          |
| sales-2016          |
| sales-2017          |
| territories          |
| territory            |
+-----+
15 rows in set (0.00 sec)
```

```
mysql> DROP TABLE customer;
Query OK, 0 rows affected (0.01 sec)

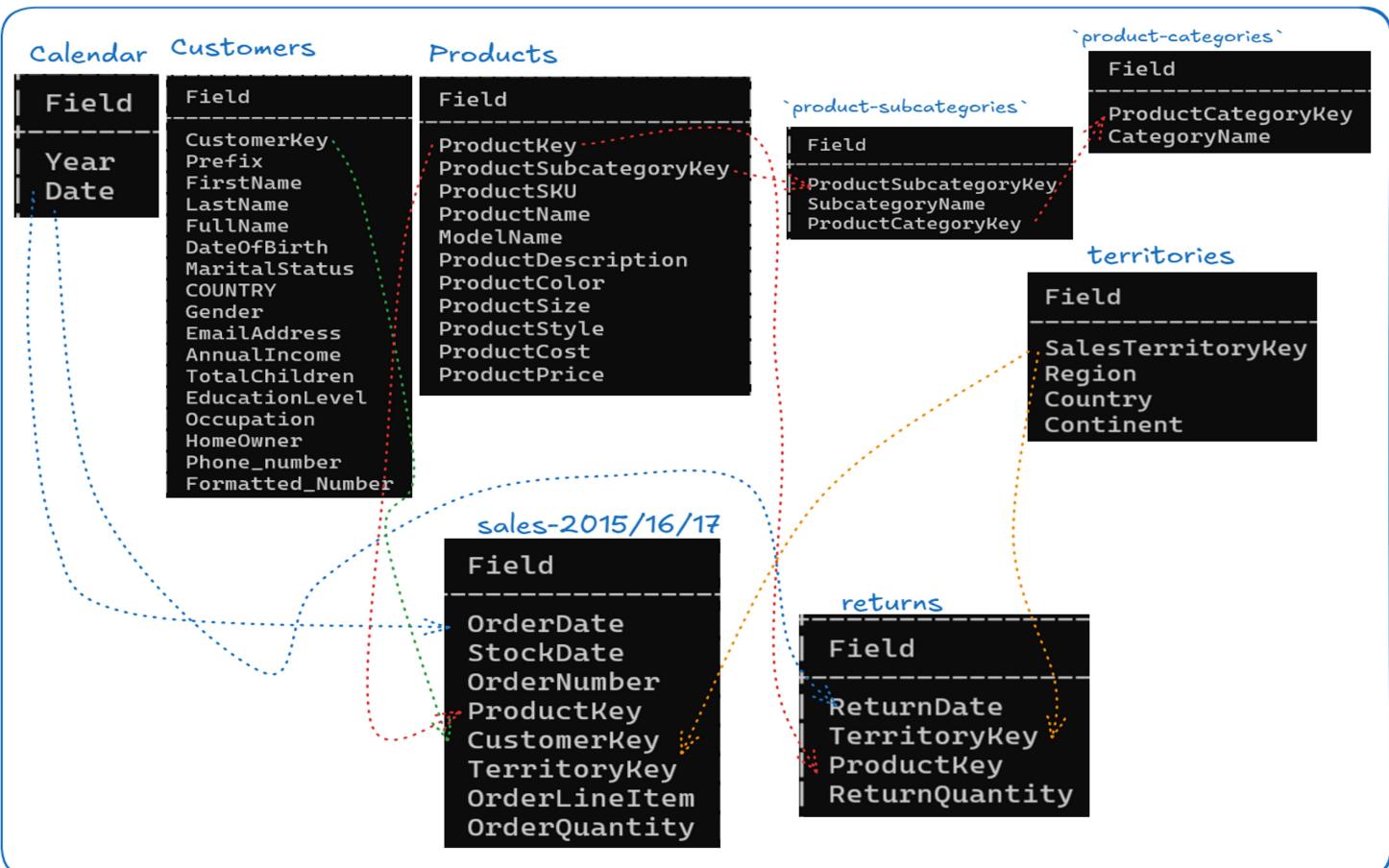
mysql> DROP TABLE customerdetails;
Query OK, 0 rows affected (0.02 sec)

mysql> DROP TABLE orders;
Query OK, 0 rows affected (0.01 sec)

mysql> DROP TABLE returns2;
Query OK, 0 rows affected (0.01 sec)

mysql> DROP TABLE territory;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SHOW TABLES;
+-----+
| Tables_in_sales_db |
+-----+
| calendar           |
| customers           |
| product-categories |
| product-subcategories |
| products             |
| returns              |
| sales-2015          |
| sales-2016          |
| sales-2017          |
| territories          |
+-----+
10 rows in set (0.00 sec)
```



JOINS - Merge Queries -> Column -> Horizontal

UNION/UNION ALL -> Row Addition -> Append Queries -> Vertically