

## 1. Primary Key Index

- **Index:** PRIMARY KEY (id)
- **Why:** Most structured database systems like PostgreSQL or MySQL automatically create a unique B-Tree index on the primary key. This allows for lightning-fast lookups when you need to fetch a specific order by its ID.

## 2. Foreign Key Index

- **Index:** CREATE INDEX idx\_orders\_user\_id ON orders(user\_id);
- **Why:** We will frequently query orders for a specific customer (e.g., "Show me all orders for User #502"). Without this index, the database would have to perform a Full Table Scan, reading every single row to find those belonging to that user.

## 3. Filtering & Sorting Index (Composite)

- **Index:** CREATE INDEX idx\_orders\_status\_created\_at ON orders(status, created\_at DESC);
- **Why:**
  - **Dashboarding:** Admin tools often filter by status (e.g., "Show all 'Pending' orders").
  - **Ordering:** Usually, we want to see the most recent orders first. By including created\_at DESC in the index, the database can retrieve the rows in the correct order without needing an expensive "Sort" operation in memory.