



GlobalBoost Coding Hacks

9. Optimize SQL Queries with Indexing for Faster Database Performance

Why: Unoptimized queries slow down apps as data grows. Indexes speed up SELECT operations by reducing scan times, vital for high-traffic sites in 2026 where databases handle terabytes of data efficiently.

How to Implement: Identify frequent WHERE clauses and add indexes via `CREATE INDEX`. Use `EXPLAIN` to analyze query plans. Apply in relational DBs like PostgreSQL or MySQL for read-heavy operations.

```
sql
-- Without index (slow full scan)
SELECT * FROM users WHERE email = 'user@example.com';

-- Hack: Add index
CREATE INDEX idx_email ON users(email);

-- Optimized query
SELECT * FROM users WHERE email = 'user@example.com';
```

Analysis: Indexes can cut query time from $O(n)$ to $O(\log n)$, often 100x faster for large tables (e.g., 1M rows). However, they add write overhead (10-20% slower inserts), so balance with query patterns; tools like pgAdmin visualize gains, ensuring responsive apps.