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90% of backend engineering essentials are in these 10 topics...

If you want to become a better backend engineer, focus your time and effort in learning on these areas:

1. Data Structures and Algorithms

- Master key concepts like hash maps, trees, graphs, and linked lists.

- Focus on sorting algorithms (like quicksort and mergesort) and search algorithms (binary search, DFS, BFS).

- Understand time complexity (Big-O) to evaluate the efficiency of your code.

2. SQL and Normalization

- Learn to write efficient SQL queries and understand joins, indexes, and views.

- Focus on normalization to eliminate redundancy and optimize database performance.

3. SOLID Principles

- These five principles help you build maintainable and scalable code.

- Key examples include Single Responsibility (one class for one purpose) and Open-Closed Principle (code that can adapt without modification).

4. Authentication and Authorization

- Understand OAuth2, JWT, session management, and role-based access control (RBAC).

- Know how to implement secure login systems and protect APIs.

5. API Development

- Focus on RESTful and GraphQL APIs.

- Understand how to properly structure endpoints, handle HTTP methods, and ensure error handling.

6. Design Patterns

- Get familiar with patterns like Singleton, Factory, Observer, and Repository.

- These patterns help in writing reusable and modular code.

7. Testing and Debugging

- Learn how to write unit tests, integration tests, and end-to-end tests.

- Master debugging tools to quickly identify and fix bugs in production.

8. Server, Network, and Hosting Environments

- Understand DNS, CDNs, HTTPS, firewalls, and how servers operate.

- Get hands-on experience with cloud platforms like AWS, Azure, or GCP.

9. Load Balancing and Scalability

- Learn how horizontal and vertical scaling works.

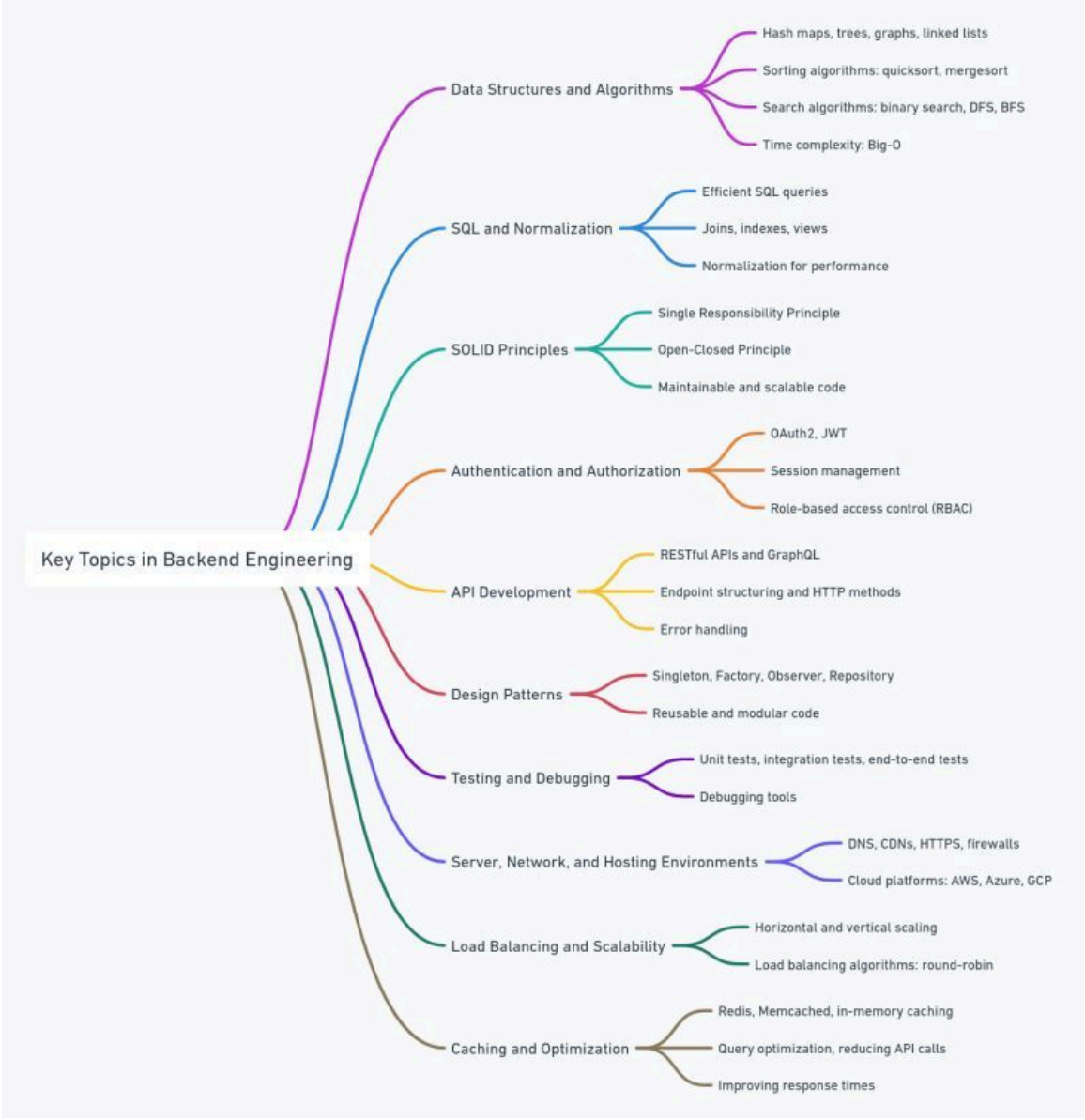
- Understand load balancing algorithms to evenly distribute traffic (e.g., round-robin).

10. Caching and Optimization

- Use Redis, Memcached, or in-memory caching to reduce load.

- Optimize database queries, reduce API calls, and improve response times.

Focusing on these areas will give you the foundation and tools to excel as a backend engineer and build systems that are scalable, secure, and maintainable.



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