System Design

🧠 **30-Day System Design Daily Task Plan (FAANG Level)**

🔹 **WEEK 1 — Fundamentals (Foundation Strong করো)**

🟢 **Day 1 — System Design mindset**

- System Design আসলে কী
- FAANG interview structure বোঝা
- Terms: latency, throughput, SLA, availability

📌 Task:

- TinyURL system overview ভাবো (no details)

🟢 **Day 2 — Client–Server & APIs**

- Client vs Server
- REST API basics
- HTTP methods + status codes

📌 Task:

- Login API flow diagram আঁকো

🟢 **Day 3 — Monolith vs Microservices**

- Pros & Cons
- When to choose what

📌 Task:

- Food delivery app monolith vs microservices compare করো

🟢 **Day 4 — Load Balancer**

- Why needed
- Types: Round-robin, Least connections

📌 Task:

- 1M user traffic flow diagram আঁকো

🟢 **Day 5 — Caching (Core Topic)**

- Cache vs DB
- Redis, CDN
- Cache hit / miss

📌 Task:

- Instagram feed caching strategy ভাবো

🟢 **Day 6 — Database Basics**

- SQL vs NoSQL
- CAP theorem
- ACID vs BASE

📌 Task:

- User table schema design করো

🟢 Day 7 — Weekly Review

- Week 1 recap
- Notes revise

📌 Task:

- TinyURL system high-level design আঁকো

🔹 WEEK 2 — Scaling & Distributed Systems

🟢 Day 8 — Horizontal vs Vertical Scaling

- Why horizontal scaling wins

📌 Task:

- E-commerce traffic scale plan লিখো

🟢 Day 9 — Sharding

- Hash-based sharding
- Range sharding

📌 Task:

- User data shard strategy design করো

🟢 Day 10 — Replication

- Master-slave

- Read replicas

📌 Task:

- Read-heavy app DB design

🟢 **Day 11 — Consistent Hashing**

- Why normal hashing fails
- Ring concept

📌 Task:

- Cache server scaling diagram আঁকো

🟢 **Day 12 — Message Queue**

- Kafka / RabbitMQ
- Async processing

📌 Task:

- Order processing async flow design করো

🟢 **Day 13 — Rate Limiting**

- Token bucket
- Leaky bucket

📌 Task:

- API rate limiter design

🟢 Day 14 — Weekly Review

📌 Task:

- WhatsApp chat system high-level design

🔹 WEEK 3 — Reliability & Real Systems

🟢 Day 15 — Reliability

- Retry
- Timeout
- Circuit breaker

📌 Task:

- Payment failure handling design

🟢 Day 16 — Idempotency

- Why needed
- Real examples

📌 Task:

- Payment API idempotent design

🟢 Day 17 — Logging & Monitoring

- Metrics
- Alerts

📌 Task:

- System monitoring checklist বানাও

🟢 Day 18 — Notification System

- Email
- SMS
- Push

📌 Task:

- Notification service architecture

🟢 Day 19 — Search System

- Indexing
- ElasticSearch basics

📌 Task:

- Product search design

🟢 Day 20 — Feed System

- Pull vs Push model
- Fan-out

📌 Task:

- Instagram feed design

🟢 Day 21 — Weekly Review

📌 Task:

- YouTube high-level architecture

🔹 WEEK 4 — FAANG Interview Mode 🔥

🟢 Day 22 — URL Shortener (Deep)

- Full design
- DB + cache
- Scale discussion

📌 Task:

- TinyURL complete design explain aloud

🟢 Day 23 — Chat System (Deep)

- WebSocket
- Message delivery guarantee

📌 Task:

- WhatsApp deep design

🟢 Day 24 — File Storage System

- Metadata
- Chunking
- Replication

📌 Task:

- Google Drive design

🟢 **Day 25 — Ride Sharing System**

- Location tracking
- Matching logic

📌 Task:

- Uber system design

🟢 **Day 26 — Trade-off Mastery**

- SQL vs NoSQL
- Sync vs Async
- Cache vs DB

📌 Task:

- 5 trade-off explain লিখে practice

🟢 **Day 27 — Bottleneck Analysis**

- SPOF
- DB overload

📌 Task:

- Given system → bottleneck identify করো

🟢 **Day 28 — Mock Interview**

- 45-minute timer
- Speak while designing

📌 Task:

- Self-mock record করো

🟢 **Day 29 — Weak Area Fix**

📌 Task:

- নিজের worst 2 topic revise

🟢 **Day 30 — Final FAANG Simulation 🎯**

📌 Task:

- Random problem pick
- Full interview flow follow

🏆 **End Result (30 Days পরে)**

তুমি পারবে:

✅ Any system break down করতে
✅ Scale explain করতে
✅ Trade-off justify করতে
✅ FAANG interviewer impress করতে