Golden Rules to answer in a System Design Interview

Dinesh Varyani

Dinesh Varyani

Rule #1

If we are dealing with a read-heavy system, it's good to consider using a Cache

Dinesh Varyani

Dinesh Varyani

Rule #2

If we need low latency in system, it's good to consider using a

Cache & CDN

Dinesh Varyani

Dinesh Varyani

Rule #3

If we are dealing with a write-heavy system, it's good to consider using a Message Queue for Async processing

Dinesh Varyani

Dinesh Varyani

Rule #4

If we need a system to be ACID complaint, we should go for RDBMS or SQL Database

Dinesh Varyani

Dinesh Varyani

Rule #5

If data is unstructured & doesn't require ACID properties, we should go for NO-SQL Database

Dinesh Varyani

Dinesh Varyani

Rule #6

If the system has complex data in the form of videos, images, files etc, we should go for Blob/Object storage

Dinesh Varyani

Dinesh Varyani

Rule #7

If the system requires complex pre-computation like a news feed, we should consider using a

Message Queue & Cache

Dinesh Varyani

Dinesh Varyani

Rule #8

If the system requires searching data in high volume, we should consider using a search index, tries or search engine like Elasticsearch

Dinesh Varyani

Dinesh Varyani

Rule #9

If the system requires to Scale SQL Database, we should consider using Database Sharding

Dinesh Varyani

Dinesh Varyani

Rule #10

If the system requires High Availability, Performance, and Throughput, we should consider using a Load Balancer

Dinesh Varyani

Dinesh Varyani

Rule #11

If the system requires faster data delivery globally, reliability, high availability, and performance, we should consider using a CDN

Dinesh Varyani

Dinesh Varyani

Rule #12

If the system has data with nodes, edges, and relationships like friend lists, and road connections, we should consider using a Graph Database

Dinesh Varyani

Dinesh Varyani

Rule #13

If the system needs scaling of various components like servers, databases, etc, we should consider using

Horizontal Scaling

Dinesh Varyani

Dinesh Varyani

Rule #14

If the system requires high performing database queries, we should consider using Database Indexes

Dinesh Varyani

Dinesh Varyani

Rule #15

If the system requires bulk job processing, we should consider using

Batch Processing & Message Queues

Dinesh Varyani

Dinesh Varyani

Rule #16

If the system requires reducing server load and preventing DOS attacks, we should consider using a Rate Limiter

Dinesh Varyani

Dinesh Varyani

Rule #17

If the system has microservices, we should consider using an API Gateway (Authentication, SSL Termination, Routing etc)

Dinesh Varyani

Dinesh Varyani

Rule #18

If the system has a single point of failure, we should implement Redundancy in that component

Dinesh Varyani

Dinesh Varyani

Rule #19

If the system needs to be fault-tolerant, and durable, we should implement Data Replication (creating multiple copies of data on different servers)

Dinesh Varyani

Dinesh Varyani

Rule #20

If the system needs user-to-user communication (bi-directional) in a fast way, we should consider using Websockets

Dinesh Varyani

Dinesh Varyani

Rule #21

If the system needs the ability to detect failures in a distributed system, we should consider implementing Heartbeat

Dinesh Varyani

Dinesh Varyani

Rule #22

If the system needs to ensure data integrity, we should consider implementing Checksum Algorithm

Dinesh Varyani

Dinesh Varyani

Rule #23

If the system needs to transfer data between various servers in a decentralized way, we should go for Gossip Protocol

Dinesh Varyani

Dinesh Varyani

Rule #24

If the system needs to scale servers with add/removal of nodes efficiently, no hotspots, we should implement

Consistent Hashing

Dinesh Varyani

Dinesh Varyani

Rule #25

If the system needs anything to deal with a location like maps, nearby resources, we should consider using Quadtree, Geohash etc

Dinesh Varyani

Dinesh Varyani

Rule #26

Avoid using any specific technology names such as - Kafka, S3, or EC2. Try to use more generic names like message queues, object storage etc

Dinesh Varyani

Dinesh Varyani

Rule #27

If High Availability is required in the system, it's better to mention that system cannot have strong consistency. Eventual Consistency is possible

Rule #28

If asked how domain name query in the browser works and resolves IP addresses. Try to sketch or mention about DNS (Domain Name System)

Dinesh Varyani

Dinesh Varyani

Rule #29

If asked how to limit the huge amount of data for a network request like youtube search, trending videos etc. One way is to implement Pagination which limits response data.

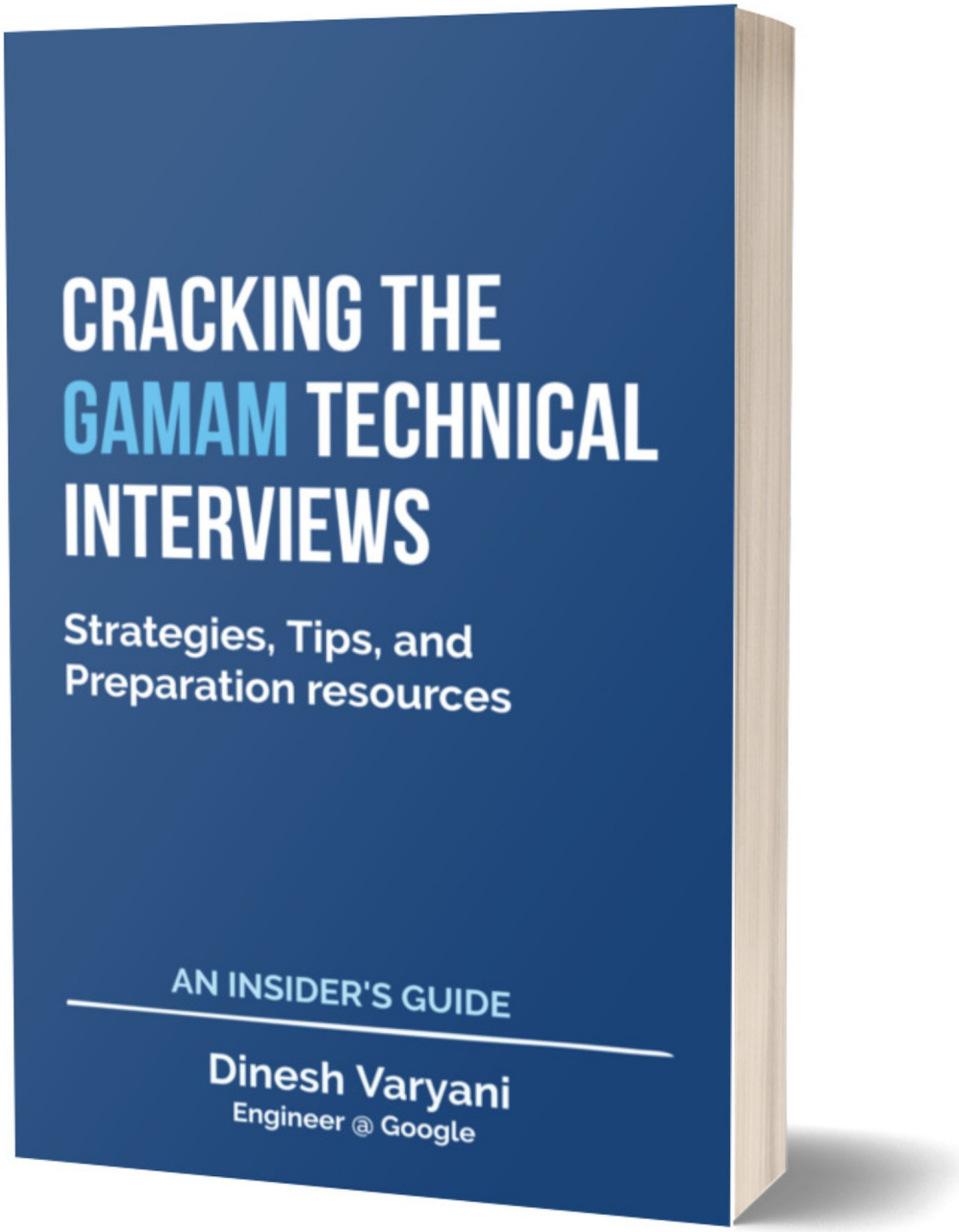
Rule #30

If asked which policy you would use to evict a Cache. The preferred/asked Cache eviction policy is LRU (Least Recently Used) Cache. Prepare around its Data Structure and Implementation.

Dinesh Varyani

Dinesh Varyani

Cracking the GAMAM Technical Interviews



Buy Now

THANK YOU !!!

For more such content follow

@Dinesh Varyani

Dinesh Varyani

Dinesh Varyani