

System Design Questions (No Answers)

This document contains all system design questions organized by category for interview preparation.

Generated on: 2025-06-16 17:43:58

Overview

Total Questions: 120 Categories: 4

Data & AI/ML Systems

Total Questions in Category: 30

1.

Difficulty: Medium

Tags: ['e-commerce', 'recommendation', 'collaborative-filtering', 'product-ranking']

2.

Difficulty: Hard

Tags: ['search-engine', 'indexing', 'ranking', 'web-crawling']

3.

Difficulty: Hard

Tags: ['recommendation', 'machine-learning', 'personalization', 'collaborative-filtering']

4.

Difficulty: Hard

Tags: ['music-recommendation', 'collaborative-filtering', 'audio-analysis', 'playlist-generation']

5.

Difficulty: Hard

Tags: ['recommendation', 'video-ranking', 'engagement-prediction', 'real-time-ml']

6.

Difficulty: Hard

Tags: ['video-recommendation', 'content-understanding', 'engagement-prediction']

7.

Difficulty: Medium

Tags: ['clickstream', 'user-analytics', 'behavioral-data', 'real-time-processing']

8.

Difficulty: Hard

Tags: ['computer-vision', 'autonomous-vehicles', 'real-time-processing', 'edge-computing']

9.

Difficulty: Medium

Tags: ['content-based-filtering', 'feature-extraction', 'similarity-matching']

10.

Difficulty: Hard

Tags: ['data-lake', 'big-data', 'storage', 'analytics']

11.

Difficulty: Medium

Tags: ['etl', 'data-pipeline', 'batch-processing', 'data-transformation']

12.

Difficulty: Medium

Tags: ['data-quality', 'monitoring', 'validation', 'data-governance']

13.

Difficulty: Medium

Tags: ['data-versioning', 'data-lineage', 'data-governance', 'metadata-management']

14.

Difficulty: Hard

Tags: ['data-warehouse', 'olap', 'columnar-storage', 'query-optimization']

15.

Difficulty: Hard

Tags: ['graph-processing', 'distributed-computing', 'graph-algorithms', 'big-data']

16.

Difficulty: Hard

Tags: ['distributed-training', 'ml-infrastructure', 'gpu-clusters', 'model-parallelism']

17.

Difficulty: Medium

Tags: ['feature-store', 'ml-infrastructure', 'feature-engineering', 'data-pipeline']

18.

Difficulty: Medium

Tags: ['experiment-tracking', 'ml-ops', 'model-versioning', 'reproducibility']

19.

Difficulty: Medium

Tags: ['model-monitoring', 'drift-detection', 'performance-tracking', 'ml-ops']

20.

Difficulty: Hard

Tags: ['ml-serving', 'model-deployment', 'inference', 'scalability']

21.

Difficulty: Hard

Tags: ['multi-tenancy', 'analytics', 'data-isolation', 'scalability']

22.

Difficulty: Medium

Tags: ['nlp', 'text-processing', 'sentiment-analysis', 'language-models']

23.

Difficulty: Hard

Tags: ['personalization', 'e-commerce', 'user-modeling', 'real-time-recommendations']

24.

Difficulty: Hard

Tags: ['real-time-analytics', 'data-processing', 'dashboard', 'metrics']

25.

Difficulty: Hard

Tags: ['anomaly-detection', 'real-time-ml', 'outlier-detection', 'monitoring']

26.

Difficulty: Hard

Tags: ['feature-engineering', 'real-time-processing', 'streaming', 'ml-pipeline']

27.

Difficulty: Hard

Tags: ['fraud-detection', 'real-time-ml', 'anomaly-detection', 'risk-scoring']

28.

Difficulty: Hard

Tags: ['real-time-recommendations', 'e-commerce', 'personalization', 'ml']

29.

Difficulty: Medium

Tags: ['time-series', 'forecasting', 'anomaly-detection', 'trend-analysis']

30.

Difficulty: Medium

Tags: ['ab-testing', 'experimentation', 'statistical-analysis', 'feature-flags']

Distributed Systems & Infrastructure

Total Questions in Category: 30

1.

Difficulty: Hard

Tags: ['social-media', 'feed-generation', 'ranking', 'real-time']

2.

Difficulty: Medium

Tags: ['ci-cd', 'automation', 'deployment', 'testing']

3.

Difficulty: Hard

Tags: ['cdn', 'caching', 'global-distribution', 'edge-computing']

4.

Difficulty: Medium

Tags: ['monitoring', 'metrics', 'alerting', 'observability']

5.

Difficulty: Hard

Tags: ['container-orchestration', 'kubernetes', 'scheduling', 'resource-management']

6.

Difficulty: Medium

Tags: ['api-gateway', 'rate-limiting', 'authentication', 'load-balancing']

7.

Difficulty: Medium

Tags: ['auto-scaling', 'resource-management', 'load-monitoring', 'elasticity']

8.

Difficulty: Hard

Tags: ['backup', 'disaster-recovery', 'replication', 'data-protection']

9.

Difficulty: Medium

Tags: ['distributed-cache', 'redis', 'sharding', 'replication']

10.

Difficulty: Medium

Tags: ['circuit-breaker', 'fault-tolerance', 'resilience', 'failure-handling']

11.

Difficulty: Medium

Tags: ['configuration-management', 'distributed-config', 'consistency']

12.

Difficulty: Hard

Tags: ['consensus', 'raft', 'distributed-systems', 'leader-election']

13.

Difficulty: Hard

Tags: ['distributed-database', 'nosql', 'consistency', 'partition-tolerance']

14.

Difficulty: Hard

Tags: ['event-sourcing', 'cqrs', 'event-store', 'eventual-consistency']

15.

Difficulty: Hard

Tags: ['distributed-storage', 'fault-tolerance', 'replication']

16.

Difficulty: Easy

Tags: ['health-checks', 'service-discovery', 'monitoring', 'availability']

17.

Difficulty: Medium

Tags: ['job-queue', 'task-processing', 'worker-nodes', 'async-processing']

18.

Difficulty: Hard

Tags: ['distributed-locks', 'coordination', 'consensus', 'high-availability']

19.

Difficulty: Medium

Tags: ['logging', 'elasticsearch', 'log-aggregation', 'search']

20.

Difficulty: Hard

Tags: ['message-queue', 'kafka', 'streaming', 'pub-sub']

21.

Difficulty: Medium

Tags: ['metrics', 'monitoring', 'time-series', 'alerting']

22.

Difficulty: Medium

Tags: ['rate-limiting', 'throttling', 'distributed-systems', 'api-protection']

23.

Difficulty: Hard

Tags: ['distributed-search', 'indexing', 'sharding', 'full-text-search']

24.

Difficulty: Medium

Tags: ['secret-management', 'encryption', 'access-control', 'security']

25.

Difficulty: Medium

Tags: ['session-management', 'distributed-cache', 'user-sessions', 'scalability']

26.

Difficulty: Medium

Tags: ['task-scheduling', 'workflow', 'dag', 'orchestration']

27.

Difficulty: Medium

Tags: ['distributed-tracing', 'observability', 'performance-monitoring']

28.

Difficulty: Medium

Tags: ['load-balancing', 'traffic-distribution', 'health-checks']

29.

Difficulty: Hard

Tags: ['microservices', 'service-mesh', 'api-gateway', 'distributed-systems']

30.

Difficulty: Hard

Tags: ['service-mesh', 'istio', 'traffic-management', 'security']

Product & Platform Systems

Total Questions in Category: 30

1.

Difficulty: Hard

Tags: ['booking-system', 'availability-management', 'payment-processing', 'two-sided-marketplace']

2.

Difficulty: Medium

Tags: ['cloud-storage', 'file-sync', 'collaboration', 'version-control']

3.

Difficulty: Medium

Tags: ['cms', 'content-management', 'publishing', 'themes']

4.

Difficulty: Medium

Tags: ['customer-support', 'ticketing', 'knowledge-base', 'automation']

5.

Difficulty: Medium

Tags: ['dating-app', 'matching-algorithm', 'geolocation', 'user-preferences']

6.

Difficulty: Hard

Tags: ['digital-wallet', 'payments', 'financial-services', 'security']

7.

Difficulty: Medium

Tags: ['event-ticketing', 'payments', 'event-management', 'qr-codes']

8.

Difficulty: Hard

Tags: ['financial-trading', 'real-time-data', 'order-execution', 'portfolio-management']

9.

Difficulty: Medium

Tags: ['fitness-tracking', 'wearables', 'health-data', 'social-features']

10.

Difficulty: Hard

Tags: ['food-delivery', 'three-sided-marketplace', 'logistics', 'real-time-tracking']

11.

Difficulty: Medium

Tags: ['freelancer-platform', 'matching', 'payments', 'project-management']

12.

Difficulty: Medium

Tags: ['telemedicine', 'video-consultation', 'patient-records', 'scheduling']

13.

Difficulty: Hard

Tags: ['hotel-booking', 'availability', 'pricing', 'reviews']

14.

Difficulty: Medium

Tags: ['inventory', 'supply-chain', 'tracking', 'optimization']

15.

Difficulty: Medium

Tags: ['e-learning', 'course-management', 'video-streaming', 'assessment']

16.

Difficulty: Hard

Tags: ['marketplace', 'auctions', 'payments', 'trust-safety']

17.

Difficulty: Medium

Tags: ['mvp', 'scalability', 'startup-architecture', 'cost-optimization']

18.

Difficulty: Hard

Tags: ['multi-tenancy', 'saas', 'data-isolation', 'scalability']

19.

Difficulty: Medium

Tags: ['news-aggregation', 'voting', 'communities', 'content-ranking']

20.

Difficulty: Medium

Tags: ['password-manager', 'encryption', 'security', 'sync']

21.

Difficulty: Medium

Tags: ['photo-storage', 'image-recognition', 'search', 'sharing']

22.

Difficulty: Medium

Tags: ['professional-networking', 'job-matching', 'content-feed', 'messaging']

23.

Difficulty: Medium

Tags: ['project-management', 'issue-tracking', 'workflow', 'reporting']

24.

Difficulty: Medium

Tags: ['real-estate', 'property-search', 'valuation', 'marketplace']

25.

Difficulty: Easy

Tags: ['recipe-sharing', 'social-features', 'search', 'user-generated-content']

26.

Difficulty: Hard

Tags: ['ride-sharing', 'two-sided-marketplace', 'matching-algorithm', 'pricing']

27.

Difficulty: Hard

Tags: ['social-media', 'photo-sharing', 'feed-generation', 'content-moderation']

28.

Difficulty: Medium

Tags: ['subscriptions', 'billing', 'recurring-payments', 'customer-management']

29.

Difficulty: Hard

Tags: ['video-streaming', 'content-delivery', 'recommendation', 'adaptive-bitrate']

30.

Difficulty: Hard

Tags: ['e-commerce', 'inventory-management', 'payment-processing', 'order-fulfillment']

Real-time & Communication Systems

Total Questions in Category: 30

1.

Difficulty: Hard

Tags: ['voice-chat', 'text-chat', 'gaming', 'real-time-communication']

2.

Difficulty: Medium

Tags: ['team-messaging', 'channels', 'real-time', 'collaboration']

3.

Difficulty: Hard

Tags: ['live-streaming', 'video-processing', 'chat', 'content-delivery']

4.

Difficulty: Medium

Tags: ['real-time-feed', 'social-media', 'timeline-generation', 'fanout']

5.

Difficulty: Hard

Tags: ['real-time-matching', 'geospatial', 'optimization', 'location-services']

6.

Difficulty: Hard

Tags: ['messaging', 'real-time', 'end-to-end-encryption', 'group-chat']

7.

Difficulty: Hard

Tags: ['video-conferencing', 'real-time-communication', 'media-streaming', 'webrtc']

8.

Difficulty: Medium

Tags: ['live-sports', 'real-time-updates', 'data-ingestion', 'push-notifications']

9.

Difficulty: Medium

Tags: ['iot', 'sensor-data', 'real-time-processing', 'edge-computing']

10.

Difficulty: Medium

Tags: ['auction-system', 'bidding', 'real-time-updates', 'payment-processing']

11.

Difficulty: Medium

Tags: ['content-moderation', 'real-time-processing', 'ml', 'safety']

12.

Difficulty: Hard

Tags: ['collaborative-editing', 'code-editor', 'real-time-sync', 'conflict-resolution']

13.

Difficulty: Hard

Tags: ['collaborative-editing', 'operational-transform', 'conflict-resolution', 'real-time-sync']

14.

Difficulty: Medium

Tags: ['collaborative-editing', 'real-time-sync', 'drawing', 'conflict-resolution']

15.

Difficulty: Easy

Tags: ['comments', 'real-time-updates', 'moderation', 'social-features']

16.

Difficulty: Medium

Tags: ['real-time-dashboard', 'data-visualization', 'streaming', 'analytics']

17.

Difficulty: Medium

Tags: ['delivery-tracking', 'real-time-location', 'logistics', 'notifications']

18.

Difficulty: Hard

Tags: ['event-streaming', 'real-time-processing', 'pub-sub', 'kafka']

19.

Difficulty: Hard

Tags: ['fraud-detection', 'real-time-ml', 'payments', 'risk-scoring']

20.

Difficulty: Medium

Tags: ['leaderboard', 'real-time-updates', 'ranking', 'gaming']

21.

Difficulty: Medium

Tags: ['location-tracking', 'gps', 'real-time-updates', 'geofencing']

22.

Difficulty: Hard

Tags: ['multiplayer-gaming', 'real-time-sync', 'game-state', 'latency-optimization']

23.

Difficulty: Medium

Tags: ['notifications', 'push-notifications', 'real-time', 'messaging']

24.

Difficulty: Medium

Tags: ['polling', 'voting', 'real-time-results', 'aggregation']

25.

Difficulty: Medium

Tags: ['presence', 'online-status', 'real-time-updates', 'user-activity']

26.

Difficulty: Medium

Tags: ['price-monitoring', 'real-time-updates', 'alerts', 'e-commerce']

27.

Difficulty: Hard

Tags: ['real-time-recommendations', 'personalization', 'streaming', 'ml']

28.

Difficulty: Hard

Tags: ['social-feed', 'real-time-updates', 'personalization', 'content-ranking']

29.

Difficulty: Hard

Tags: ['stock-trading', 'real-time-data', 'order-matching', 'market-data']

30.

Difficulty: Medium

Tags: ['weather-monitoring', 'sensor-networks', 'data-aggregation', 'forecasting']
