Decoding Database Dilemmas

SDE Skills System Design Primer Handout

Introduction

- **Purpose**: Guide to choosing the right database for system design interviews, and on the job.
- **Scope**: Comparison of SQL vs. NoSQL databases and beyond.

SQL Databases

- **Relational Model**: Data is organized in tables with predefined schemas.
- **ACID Properties**: Ensures reliable transactions (Atomicity, Consistency, Isolation, Durability).
- **Use Cases**: Ideal for complex queries and data integrity.
- **Mental model of use-cases: where it succeeds**, **where does it fail**?

NoSQL Databases

- **Flexibility**: Schema-less design allows for varied data types.
- **Scalability**: Horizontal scaling to handle large volumes of data.
- **Use Cases**: Suitable for unstructured data and rapid development.
- **Types of NoSQL databases**.

- **Mental model of use-cases:**
  - **Where do they succeed, where do they fail?**
  - **How to choose from among the myriad of choices available?**

Choosing the Right Database

- **Considerations**: Data structure, scalability, consistency, and complexity.
- **Checklist**:
  - [ ] Define data relationships.
  - [ ] Assess transaction requirements.
  - [ ] Evaluate query complexity.
  - [ ] Determine scalability needs.

Notes