Vindya Siriwardane – 2022 September Software Engineering Internship

1. **Explaining what is design pattern and how we can use design patterns in projects.**

Design patterns are solutions to general occurring problems in software development industry which were originally obtained by trial and error over a considerable period of time. (eg: Singleton Pattern, Builder Pattern).

A design pattern can be used as a template for a project across all programming languages and can be used to fit any project because they only provide a general outline of a solution.

1. **What is DTO and explain the use of it.**

DTO stands for Data Transfer Object. It is a design pattern used to transfer data between software application subsystems. Another use for DTOs is to encapsulate parameters for method calls.

1. **How are you going to store secrets in an application without exposing it to the internet?**

Including secrets in .env file/. properties file.

1. **What is JWT and how does it work?**

JWT stands for JSON Web Token. Using JWT, we can send a user’s identity to a backend service. And there is no need to keep tokens in-memory between requests. The authentication server can issue the token, send it back and then immediately discard it.

JWT is a Base64URL encoded string, split into three sections, delimited by periods.

Section one is the header. This section contains JWT metadata; typically, information about the type of token and the algorithm used to sign it. It is encoded JSON.

Section two is the payload. This is the content of the token and is also encoded JSON.

Section three is the signature. This is the SHA256 (or some other HMAC) hash of the encoded header, encoded payload, and a secret. This part of the JWT is used to verify the integrity of the message.

1. **What is the difference between SQL and NoSQL databases?**

|  |  |
| --- | --- |
| **SQL** | **NoSQL** |
| RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS) | Non-relational or distributed database system. |
| These databases have fixed or static or predefined schema | They have dynamic schema |
| These databases are not suited for hierarchical data storage. | These databases are best suited for hierarchical data storage. |
| These databases are best suited for complex queries | These databases are not so good for complex queries |
| Vertically Scalable | Horizontally scalable |
| Follows ACID property | Follows CAP(consistency, availability, partition tolerance) |
| Examples: MySQL, PostgreSQL, Oracle, MS-SQL Server etc | Examples: MongoDB, GraphQL, HBase, Neo4j, Cassandra etc |

1. **Suggest a good state management for frontend application and explain why you recommend it.**

Redux

There are some advantages of using Redux as a state management library as follows.

Every state is immutable.

It is Highly Maintainable.

When a state changes in Redux, it returns a new state which often uses a shallow copy. So, the probability of re-renders is reduced substantially.

there is no data encapsulation, any component can access it.