WILP

By Rahul

Client-server Architecture

Session 1: Client Server Architecture

- Client-Server Architecture
- Client
- Server
- Example of client server architecture
- Working of client server architecture
  - IP
  - DNS Servers
- Http Request

Session 1 Assignment

- Type of Client Server Architecture
- Structure of web url
- Http request methods
- Use of the network tab in chrome developer tools
- What is an API

Session 2: Client Server Architecture

- Website vs Web Application
- Monolithic vs Microservice Architecture
- REST API’s

Session 2 Assignment

- Type of Web Applications
- SSR vs CSR
- Sessions vs Tokens vs Cookies

Session 3: Client Server Architecture

- Single Page application vs Static Application
- SOA
  - https://www.youtube.com/watch?v=_dFJOSR-aFs
- SOA vs Microservice

Session 4: Coding Principles

- Coding Principles
- DRY Principle
- SOLID Principle
  - https://medium.com/backticks-tildes/the-s-o-l-i-d-principles-in-pictures-b34ce2f1e898
  - https://www.freecodecamp.org/news/solid-principles-explained-in-plain-english/
  - https://www.digitalocean.com/community/conceptual_articles/s-o-l-i-d-the-first-five-principles-of-object-oriented-design
- Suggested Books:
  - Clean Code by *Bob Martin*
  - Clean Coder by *Bob Martin*

Session 4 Assignments

- Read about more coding principles

Session 5: Architecture and Design Patterns

- Architecture vs Design Patterns
- MVC
  - https://www.youtube.com/watch?v=mtZdybMV4Bw
- MVP
- MVVM
- Difference in MVC, MVP, MVVM
  - https://www.youtube.com/watch?v=qzTeyxlW_ow

Session 6: Design Patterns

- GANG OF FOUR
  - Creational
    - Singleton
    - Factory
    - Abstract Factory
    - Builder
    - Prototype
  - Structural
    - Adapter
    - Composite
    - Proxy
    - Flyweight
    - Facade
    - Bridge
    - Decorator

Session 7: Design Patterns

- GANG OF FOUR
  - Behavioural
    - Template Method
    - Mediator
    - Chain Of Responsibility
    - Observer
    - Strategy
    - Command
    - State
    - Visitor
    - Interpreter
    - Iterator
    - Memento

Session 7: Assignment

- What is Data and Database?
- What is Database Management System(DBMS)
- DBMS vs Traditional File System

Session 8: Database

- RDBMS vs DBMS
- SQL vs NoSQL
  - https://www.guru99.com/sql-vs-nosql.html
- ER Diagram
  - Cardinality

Session 8: Assignment

- ACID properties
- SQL Queries in DBMS
- Type of SQL Queries
- Joins, GROUP BY and Indexing in SQL
  - https://dataschool.com/sql-optimization/partial-indexes/
- Stored Procedures
- Online SQL Editor: https://www.programiz.com/sql/online-compiler/

Session 9: DBMS

- Normalization and Anomalies
  - https://www.javatpoint.com/dbms-forth-normal-form
  - https://www.javatpoint.com/dbms-fifth-normal-form
- Transactions, locking, Deadlock
  - https://www.studytonight.com/operating-system/deadlock-avoidance-in-operating-system
- Why NOSQL is fast as compared to RDBMS

Session 10: Assignment

- SDLC (Software Development Life Cycle)
- SDLC phases
- SDLC Models
  - Waterfall Model:- Short Projects, when we are sure customer not going to change the requirements
  - Spiral Model:- Project is divided into small projects, helpful when requirements are provided in batches
  - V-Model:- Complex and larger application, high quality product
  - Prototype model:- Customer not sure about his own requirements
- Agile SDLC Model in detail

Session 10: SDLC

- Daffodil’s SDLC Model

Session 11: Exception Handling(Assignment)

- Exception Handling
- Why Exception Handling is a costly operation
  - Because of the Exception object created
  - Time involved in creating the stack trace
  - Exceptions to be handled at the top level

Session 12: Data Structure

- What is Data Structure
- Algorithm
- Flowchart
- Array
- Recursion
- Stack

Session 13: Data Structure

- Queue
- Heap
- HashMaps

Session 14: Data Structure

- Linked List
- Tree and Graph

Session 15: DAA

- Time and space complexity
- Time complexity in recursive programs
  - https://www.gatevidyalay.com/recursion-tree-solving-recurrence-relations/
  - https://www.geeksforgeeks.org/analysis-algorithm-set-4-master-method-solving-recurrences/
  - https://www.scaler.com/topics/data-structures/masters-theorem/