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Core Java:

1. What is Front End Development
2. Front End Technologies
3. What is Back End Development
4. Backend Development Technologies
5. What is Full stack Development
6. Advantages of Full stack Development
7. Roles of Full stack Developer
8. What is Programming Language?
9. Types of programming languages
10. Java Introduction
11. History of Java
12. Principles of Java
13. Java Installation
14. Java Program Execution Flow
15. JDK vs JRE
16. JVM Architecture
17. Language Fundamentals
 - Identifiers & Keywords
 - Data Types
 - Variables
 - Methods
 - Arrays
18. Declarations and Access Control
19. Interfaces
20. Operators
21. Flow Control
22. Exception Handling
23. Assertions
24. Garbage Collections
25. OOPs
26. Multi-Threading
27. java.lang Package:
 - String
 - StringBuffer
 - StringBuilder
 - Wrapper Classes,
 - Object class Methods,
 - Autoboxing
28. java.io package
29. Serialization
30. Collections Framework
 - . List
 - . Set
 - . Map
 - . Internal implementation of collection
 - framework (List, Map, Set etc)
31. Generics
32. Inner Classes
33. Java 8 Features Introduction
34. Lambda Expressions
35. Functional Interfaces
36. Default & Static Methods
37. Method References
38. Date and Time API changes
39. Stream API
40. Optional class
41. Spliterator

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SQL:

- | | |
|----------------------|---------------|
| ❖ Select | ❖ Drop Table |
| ❖ Select Distinct | ❖ Alter Table |
| ❖ Where | ❖ Constraints |
| ❖ And, Or, Not | ❖ Not Null |
| ❖ Order By | ❖ Unique |
| ❖ Insert Into | ❖ Primary Key |
| ❖ Null Values | ❖ Foreign Key |
| ❖ Update | ❖ Check |
| ❖ Delete | ❖ Default |
| ❖ Select Top | ❖ Index |
| ❖ Min and Max | ❖ Auto |
| ❖ Count, Avg, Sum | ❖ Increment |
| ❖ Like | ❖ Dates |
| ❖ Wildcards | ❖ Views |
| ❖ In | ❖ Injection |
| ❖ Between | ❖ Hosting |
| ❖ Aliases | ❖ Data Types |
| ❖ Joins | |
| ❖ Inner Join | |
| ❖ Left Join | |
| ❖ Right Join | |
| ❖ Full Join | |
| ❖ Self Join | |
| ❖ Union | |
| ❖ Group By | |
| ❖ Having | |
| ❖ Exists | |
| ❖ Any, All | |
| ❖ Select Into | |
| ❖ Insert Into Select | |
| ❖ Case | |
| ❖ Null Functions | |
| ❖ Stored | |
| ❖ Procedures | |
| ❖ Comments | |
| ❖ Operators | |
| ❖ Database | |
| ❖ Create DB | |
| ❖ Drop DB | |
| ❖ Backup DB | |
| ❖ Create Table | |

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JDBC:

- ❖ Introduction
- ❖ Environment
- ❖ Sample Code
- ❖ Driver Types
- ❖ Connections
- ❖ Statements
- ❖ Result Sets
- ❖ Data Types
- ❖ Transactions
- ❖ Exceptions
- ❖ Examples
- ❖ Create Database
- ❖ Select Database
- ❖ Drop Database
- ❖ Create Tables
- ❖ Drop Tables
- ❖ Insert Records
- ❖ Select Records
- ❖ Update Records
- ❖ Delete Records
- ❖ Mini Project on JDBC

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HIBERNATE:

- ❖ Introduction.
- ❖ Advantages of Hibernate compared to JDBC
- ❖ ORM (Object Relational Mapping)
- ❖ Configuration xml file and Mapping xml file along with dtos.
- ❖ Hibernate architecture
- ❖ Installation and Directory Structure
- ❖ Hibernate Data Types.
- ❖ First Application using Hibernate.
- ❖ Hibernate API
- ❖ CRUD operations
- ❖ Primary key Generators
- ❖ Hibernate Query Language (HQL)
- ❖ Native
- ❖ Criteria API
- ❖ Inheritance in Hibernate
- ❖ Relations (one to one, one to many, many to one, many to many)
- ❖ Caching
- ❖ Connecting with Multiple Databases
- ❖ Integrating Hibernate with Servlets and Struts
- ❖ Hibernate Annotations





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Spring Core:

- ❖ IOC
- ❖ Dependency Injection
- ❖ AutoWiring
- ❖ BeanLifeCycle

Spring Boot:

- ❖ Spring vs Spring Boot
- ❖ Spring Boot Advantages
- ❖ Spring Boot Starter Poms
- ❖ Spring Boot Application creation
 - o Initializer website
 - o IDE
- ❖ @SpringBootApplication
- ❖ @ComponentScanning
- ❖ Auto-Configuration
- ❖ SpringApplication.run() method
- ❖ Banner in Spring Boot
- ❖ Runners in Spring Boot
 - o Application Runner
 - o Command-Line Runners

Spring Data JPA:

- ❖ Persistence Layer
- ❖ Best Practises for Persistence Layer
- ❖ Differences between Hibernate & Data JPA
- ❖ Spring Data JPA repositories
 - o CrudRepository
 - o JpaRepository
- ❖ Entity class (with Annotations)
- ❖ Curd Operations using Data JPA
- ❖ Pagination & Sorting
- ❖ Generators
- ❖ Custom Generators
- ❖ application.properties file & application.yml
- ❖ Profiles in Spring Boot
- ❖ Oracle DB Integration
- ❖ MySql DB Integration
- ❖ Embedded DB (h2) Integration
- ❖ Monog DB Integration

Spring Web MVC:

- ❖ MVC Introduction
- ❖ Spring MVC Introduction
- ❖ Spring MVC Architecture
- ❖ DispatcherServlet (Front Controller)
- ❖ HandlerMappers
- ❖ Controllers
- ❖ View Resolvers
- ❖ RequestMappings
- ❖ Spring Form Tag Library
- ❖ Form Based applications
- ❖ Form app with JSP front End
- ❖ Form app with Thymeleaf Front End
- ❖ Form validations
- ❖ Model
- ❖ ModelAttribute
- ❖ @RequestBody
- ❖ @ResponseBody
- ❖ Interceptors in Spring MVC
- ❖ Spring Boot Actuators
- ❖ Exception Handling using Spring AOP

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Restful Services:

- ❖ Distributed Applications
- ❖ Distributed Technologies
- ❖ SOAP vs REST
- ❖ Rest Introduction
- ❖ Rest Architecture
- ❖ Rest Principles
- ❖ Rest Application Development using Spring With REST
- ❖ Internals of REST Application
- ❖ HTTP Protocol
 - Http Request Structure
 - Http Response Structure
- ❖ Http Status Codes
- ❖ Http Status Messages
- ❖ GET
- ❖ POST
- ❖ PUT
- ❖ DELETE
- ❖ JSON with Jackson
- ❖ XML with JAX-B
- ❖ Swagger
- ❖ Swagger UI
- ❖ POSTMAN
- ❖ Exception Handling REST API
- ❖ Rest Client Introduction
- ❖ java.net client
- ❖ apache http client
- ❖ RestTemplate
- ❖ WebClient (reactive programming- Spring 5.x)
- ❖ Mono Objects
- ❖ Flux Objects
- ❖ Asynchronus Communications

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❖ Microservices:

- ❖ Monolith Architecture
- ❖ Drawbacks of Monolith
- ❖ Load Balancers
- ❖ Load Balancer Algos
- ❖ Sticky session
- ❖ IP Hashing
- ❖ Round Robin etc.
- ❖ Microservices Introduction
- ❖ Microservices challenges
- ❖ Microservices Advantages
- ❖ Microservices Architecture
- ❖ Service Registry (Eureka Server)
- ❖ API Gateway with Zuul proxy
- ❖ Config Server
- ❖ Microservices Development
- ❖ Interservice Communication (FeginClient)
- ❖ Angular 10 Integration
- ❖ Cloud Platforms
- ❖ PCF cloud
- ❖ PCF account creation
- ❖ PCF CLI
- ❖ Microservice Deployment to Cloud
- ❖ Scaling
- ❖ Horizontal Scaling
- ❖ Vertical Scaling
- ❖ Autoscaling

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Java Realtime Project (Full Stack Development):

INTRODUCTION

- ❖ Introduction to Real-time Project
- ❖ Types of Software companies
 - Product Based Companies
 - Service Based Companies
 - Outsourcing Companies
 - Interview process in software companies

❖ Types of software jobs

Permanent Job
Contract Job

❖ Types of software projects

- Scratch Development Projects
- Maintenance Projects
- Migration Projects

❖ Types of teams in software project

- On-shore Team
- Off-shore Team

❖ How to collaborate with team members

❖ Discussion related to Bridge calls & Official emails

❖ Role Chart Details

➤ **Realtime Tools**

- ❖ Maven
- ❖ Gradle
- ❖ SVN
- ❖ Git
- ❖ BitBucket
- ❖ Agile with JIRA
- ❖ JUnit
- ❖ Mocking
- ❖ Jacoco
- ❖ Log4J
- ❖ Log Monitoring tools
- ❖ (Putty, WinScp, Splunk)
- ❖ JMETER
- ❖ Sonar Qube
- ❖ Docker
- ❖ MAT
- ❖ Jenkins
- ❖ Apache POI
- ❖ Swagger
- ❖ SOAP UI
- ❖ POSTMAN

➤ **SDLC (Agile)**

- ❖ Story
- ❖ Story Points
- ❖ Backlog grooming
- ❖ Sprint Planning
- ❖ Sprint
- ❖ Sprint Duration
- ❖ Scrum
- ❖ Mid-iteration review
- ❖ Retrospective
- ❖ Real-time Environment Terminology
- ❖ Requirements Gathering
- ❖ Minutes of meeting
- ❖ Query Log
- ❖ DB Design
- ❖ DB Template
- ❖ Real-time Coding Standards

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Mini Projects (All mini projects we will develop using spring boot & microservices)

- i. Mini Project 01
- ii. Mini Project 02
- iii. Mini Project 03
- iv. Mini Project 04
- v. Mini Project 05
- vi. Mini Project 06
- vii. Mini Project 07
- viii. Mini Project 08
- ix. Mini Project 09
- x. Mini Project 10

MAJOR PROJECT DEVELOPMENT

- 1) Major Project Introduction
- 2) Major Project Modules
- 3) Major Project Architecture
- 4) Major Project Functional Flow
- 5) Database Design
- 6) Story Creation in JIRA
- 7) Story Development
- 8) Logging in Project
- 9) Swagger Configuration
- 10) Actuators Configuration
- 11) Exception Handling
- 12) Multi-Threading use case in Project
- 13) Rest Calls in Project
- 14) Batch Processing
- 15) Unit Testing
- 16) Integration Testing
- 17) Code Review
- 18) Project Deployment

INTERVIEW GUIDE

- 1) Resume Preparation
- 2) Profile Creation in job portals
- 3) Email Writing
- 4) HR Discussion details
- 5) Joining Formalities
- 6) First day and last day in office
- 7) Daily Activities in Job
- 8) Interview Tips & Tricks

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HTML, CSS, JavaScript, and ReactJS Curriculum - Beginner to Intermediate

❖ 1. Beginner Curriculum

- 1) Introduction to Web Development
- 2) Overview of Web Development
- 3) How Websites Work: Frontend vs. Backend
- 4) Introduction to HTML, CSS, and JavaScript

❖ 2. HTML Basics

- 1) HTML Structure and Document Layout
- 2) Tags, Elements, and Attributes
- 3) Basic HTML Tags: Headings, Paragraphs, Links, Images
- 4) Lists and Tables
- 5) Forms and Input Elements
- 6) Best Practices in HTML

❖ 3. CSS Fundamentals

- 1) Introduction to CSS and How It Works with HTML
- 2) CSS Syntax and Selectors
- 3) Styling Text: Font, Color, Alignment, etc.
- 4) Layouts: Margins, Padding, Borders
- 5) Box Model Concept
- 6) Working with Backgrounds and Images
- 7) CSS Units (px, %, em, rem) and Positioning
- 8) CSS Flexbox and Grid Basics

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4. JavaScript Basics

- 1) What is JavaScript and How It Works in the Browser
- 2) Variables, Data Types, and Operators
- 3) Control Structures: Conditionals and Loops
- 4) Functions and Scope
- 5) Basic DOM Manipulation
- 6) Event Handling (Click, Hover, etc.)
- 7) Arrays, Objects, and Basic Array Methods
- 8) Debugging in JavaScript

5. Introduction to ReactJS

- 1) Understanding Single Page Applications (SPA)
- 2) What is React and Why Use It?
- 3) Setting Up a React Environment (Using npx create-react-app)
- 4) React Component Basics: Functional Components
- 5) JSX: JavaScript Syntax Extension for React
- 6) Props and State
- 7) Handling Events in React
- 8) Basic Styling in React (Inline CSS and CSS Modules)

6. Building a Simple Project

- 1) Integrating HTML, CSS, and JavaScript Skills
- 2) Creating a Static Web Page (Portfolio or Blog Page)
- 3) Adding Basic Interactivity with JavaScript

7. Building a React Project

- 1) Project Overview: Building a Simple To-Do App or Counter
- 2) Structuring Components
- 3) Managing State and Props
- 4) Adding Dynamic Styling and Animations
- 5) Deploying the Project on GitHub Pages or a Similar Platform

8. Final Project and Review

- ❖ Project: Personal Portfolio with React
- Review of Key Concepts

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Intermediate Curriculum

1. Advanced HTML and CSS

- 1) HTML5 Semantic Elements
- 2) Accessibility Best Practices
- 3) Responsive Web Design with CSS Media Queries
- 4) Advanced CSS Selectors and Pseudo-Classes
- 5) CSS Animations and Transitions
- 6) CSS Preprocessors (e.g., SASS) Overview
- 7) Responsive Layouts with Flexbox and Grid in Depth
- 8) Working with CSS Variables

2. JavaScript Deep Dive

- 1) ES6+ Syntax and Modern JavaScript Features
- 2) let, const, arrow functions, template literals
- 3) Destructuring, spread/rest operators
- 4) Working with Promises and Async/Await
- 5) Understanding Closures, Scope, and the "this" Keyword
- 6) JavaScript Modules and Imports/Exports
- 7) Advanced Array and Object Methods (map, filter, reduce)
- 8) Error Handling and Debugging Techniques
- 9) Introduction to JavaScript Fetch API and AJAX

3. Intermediate DOM Manipulation and Events

- 1) Advanced DOM Selection and Manipulation
- 2) Dynamic Content Creation with JavaScript
- 3) Event Delegation and Bubbling/Capturing
- 4) Form Validation and Regular Expressions
- 5) Using Local Storage and Session Storage
- 6) Modularizing Code with JavaScript Classes and Prototypes

4. Advanced ReactJS Concepts

- 1) React Functional vs. Class Components
- 2) Introduction to React Hooks
- 3) useState, useEffect, and Custom Hooks
- 4) Component Lifecycle and Side Effects
- 5) State Management with Context API
- 6) Working with Forms in React and Controlled Components
- 7) Prop Drilling and Composition Techniques
- 8) Prop Types and Type Checking
- 9) Basic Routing with React Router

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5. API Integration in React

- 1) Introduction to RESTful APIs and JSON
- 2) Using the Fetch API and Axios in React
- 3) Fetching Data from Public APIs
- 4) Error Handling with API Calls
- 5) Displaying Loading States and Error Messages
- 6) Building a CRUD App with API Integration

6. Advanced Project: Building a Responsive React App

- 1) Project Planning and Component Structuring
- 2) State and Data Flow Management
- 3) Implementing Responsive Design with CSS and Flexbox/Grid
- 4) Adding Interactivity and Animations with CSS and JavaScript
- 5) API Integration with CRUD Operations (e.g., a To-Do App or Blog)
- 6) Using React Router for Multi-Page Functionality

7. Testing and Optimization in React

- 1) Basics of Unit Testing in React
- 2) Testing Tools: Jest and React Testing Library
- 3) Writing Tests for Components and Hooks
- 4) Performance Optimization Techniques in React
- 5) Memoization with React.memo and useMemo
- 6) Code Splitting and Lazy Loading
- 7) Minimizing Re-Renders and Improving Load Time
- 8) Analyzing Performance with React DevTools

8. Deployment and Version Control

- 1) Introduction to Git and GitHub (Branching, Merging, Pull Requests)
- 2) Preparing a React App for Production
- 3) Deployment on Platforms like Netlify, Vercel, or GitHub Pages
- 4) Setting up Continuous Integration/Continuous Deployment (CI/CD) Basics

9. Final Project and Portfolio Preparation

Project: Create a Fully-Functional Web App (e.g., Weather App, Blog Platform, or e-Commerce Interface)

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