Day1

Agile Methodologies and Practices

- What is Agile?
- Various Agile Frameworks
- Waterfall vs. SCRUM
- Why Agile?
- SCRUM ceremonies
- What is Continuous Integration?
- What is Continuous Delivery?
- What is Continuous Deployment?
- What is DevOps?
- DevOps vs. CI

TDD

- What is TDD?
- Why TDD?
- Scope of TDD
- What is fail--fast?
- Test--first development vs. Test -- after development approach
- Brief Intro to JUnit
- Developing an application in Java following the TDD approach
- & Refactoring

Testing with Mock objects

- Testing in isolation
- Mock frameworks
- What Are Mock Objects?
- When and How to Use Mock Objects
- Stubs and Mocks
- Mocking the database and services
- Mock object life cycle
- Working with Mocks in Mockito framework

Code Refactoring Process

- When to refactor
- Change the code structure without affecting behaviour
- Make it more reusable and flexible.
- Test re-factored Code
- The Refactoring techniques
- Identify and Implement Refactoring
- Loose coupling with code abstractions
- The continuous refactoring process

Refactoring techniques and patterns

- How to refactor
- Refactoring patterns
- Extract variable
- Extract method
- Extract class
- Extract interface
- Extract super class
- Push-pull of methods and variables
- Add abstract base class

Day2

The Web Landscape

- Internet Client-server architecture.
- HTML and HTTP
- Define Sample web page in html
- Deploy and run sample web page in web server
- CSS for presentation
- Role of scripting language JavaScript
- Define web pages with different aspects of information

Java EE Web Applications with Servlets

- The web dynamics
- The dynamic programming on server
- The role of Server
- Java EE containers and components
- Java EE Web and Application Servers
- Web and Enterprise components
- The Servlet API
- Work with Generic Servlet and HttpServlet
- Web Deployment Descriptor- Web.xml
- The URL Mapping

More with Web applications

- Manage MIME types
- The ServletConfig and ServletContext
- The Request and Response API
- Servlet life cycle
- Deploy and run servlet applications
- The Web Application container events

Day3

BDD

- What is BDD?
- Why BDD?
- Scope of BDD
- Brief Intro to Gherkin & Cucumber
- Developing an application in Java following the BDD approach & Refactoring to Clean Code
- Introduction to BDD with Cucumber

Day4

SOAP WEBSERVICES

- What is a Web Service?
- SOAP -- a brief introduction
- What is WSDL?
- High--Level SOAP Architecture
- Developing a SOAP web service in Java following BDD style
- Deploying the web service in Apache Tomcat

RESTFUL WEBSERVICES

- What is a Restful Web Service?
- SOAP vs REST API
- High-- Level REST Architecture
- Developing a REST web service in Java following BDD style
- Deploying the web service in Apache Tomcat

Day5

Apache Maven

- What is Maven?
- Maven High--level Architecture
- POM file
- Maven Coordinates
- Convention over Configuration
- Maven Local, Private & Central
- Repositories
- Effective POM
- Super POM
- Maven Dependencies & Plugins
- Maven Life Cycles and Phases
- Maven Plugins and Goals
- Developing simple web applications and deploying artifacts

GIT & GITHUB

- What is Version Control?
- What is Git?
- What is GitHub?
- How Git is different compared to other Version control tools?
- Creating a local git repository
- Staging files
- Committing files to Local Git Repository
- Cloning source code from GitHub Repository
- Pulling delta changes from GitHub to already cloned code
- Pushing code to GitHub

Day6

Jenkins CI and CD Server

- What is Jenkins ?
- What is CI ?
- How & where Git, Maven, TDD, BDD, Jenkins fits in CI ?
- Agile & CI how they are related ?
- Configuring Jenkins, Tools & Plugins
- Jenkins FreeStyle vs Maven Job
- Setting up a CI Job for a simple Java Project
- What is Jenkins Pipeline?
- Configure CI and CD pipeline for a login web application

Day7

Docker Container Engine

- How multi--booting was done a couple of decades ago?
- What is LILO/GRUB?
- Benefits & drawbacks of multi--˘booting using GRUB
- What is Virtualization?
- What is a Hypervisor?
- Popular Hypervisors
- High--Level Architecture of Hypervisor
- What is Application Virtualization?
- Benefits & drawbacks of Hypervisors
- Container vs. VM.
- High--Level Architecture of Docker
- Understanding Docker Images & Containers
- Managing Docker Images & Containers

Day8

Kubernetes for Container orchestration

- Introduction and features
- Kubernetes architecture
- Kubernetes with container engine
- Kubernetes Core Concepts
- DinD Cluster overview
- The kubectl for application deployment and monitoring
- Basic objects
    - Pod
    - Service
    - Volume
    - Namespace
- The pod configuration in YML file
- Create and manage pods with kubectl
- The host network and host port mode
- Run and monitor the pods with logs
- Inspect the pods
- Interact with pods
- Pods with multiple containers: inspect, interact and logs
- Linking the containers in pod
- Monitor and manage the cluster with dashboard
- Scaling and Load Balancing in the cluster

Day9

MICROSERVICES

- What is a monolithic architecture?
- What are Micro--services?
- Benefits and drawbacks of Monolithic applications
- Benefits and drawbacks of Microservices
- Scaling the MicroService applications
- Deploying MicroService into Kubernetes cluster

CLOUD COMPUTING

- What is Cloud Computing?
- On--premise servers vs cloud computing
- Benefits & Challenges of Cloud Computing
- Various Cloud Services Providers
- Demo creating an EC2 instance (VM) or Droplet using AWS/Digital Ocean
- Accessing the Cloud VM from the local machine
- Installing software in Cloud VM
- Disposing Cloud VM
- Understanding the mindset with which we should approach

- On--premise servers
- Cloud resources

BIG DATA Theoretical Overview

- What is Big--data?
- Examples of Big--data
- Types of Big--data
- Structured
- Unstructured
- Semi--structured
- Data growth over the years
- Characteristics of Big--data
- Benefits of Big--data processing
- NoSQL vs Traditional Databases
- Practical use--cases of BigData analytics

Artificial Intelligence and Machine Language Introduction

- What is Artificial Intelligence?
- What is Machine Learning?
- What is Deep Learning?
- Some practical use--ˇcases of AI today
- Scope of AI in CRM
- Benefits of AI Understanding
- Supervised MI
- Unsupervised MI
- Semi--supervised MI
- Reinforcement MI

WORKSHOP

- Participants will be divided into 4 groups, as a team they will identify how any client can make use of
- MicroServices, Containers, BigData & AI/ML technologies to their benefit.
- Group Activity
- Participants will work as a small team
- Identify areas where these advanced technologies can be put to use
- Challenges that need to be addressed
- Each team will demonstrate their ideas on how Clients can utilize these modern technologies

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