**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-­ˇbooting 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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