Cognizant Academy

ADM Full Stack Engineering

Learning Guide - Java

Why do we need this Full Stack Engineering Program?

Full Stack Engineering program engages young talents with a comprehensive learning pathway, giving these millennials an opportunity to become a Full Stack Engineer, understand the corporate environment and groom themselves even before they join us. Cognizant emphasizes on Learner Autonomy where students take charge of their own learning pathway, with the available tools and resources. More focus is given to “learning” than “teaching”. Get ready to embark your own learning adventure!

Program at a glance

Full Stack Prep-up Internship Program has 4 stages:

- Stage 1 - Core Programming Fundamentals
- Stage 2 - Application Frameworks
- Stage 3 - FSE Skills - Part I
- Stage 4 - FSE Skills - Part II
- Integrated Development Project (IDP)

Program Highlights

- The complete learning journey is formalized using adult learning principles, where problem solving and applying the skills gained are given more importance than conceptual learning.
- Learner Autonomy is implemented via Flipped Classroom, where the learning platform offers world class learning resources, and students would not be constrained by tutelage of an instructor.
- Get mentored by Subject Matter Experts, whose motivation and guidance will help you accelerate in the learning journey.
- Higher order framework concepts would be dealt with Trainer support in Instructor Led training mode.

cognizant

Service Lines

Service lines can simply be defined as a modern organizational structure strategy for resource planning and allocation for any size of business. Typically, traditional organizational structure models are more vertically aligned -- think of an employee who has several bosses in the hierarchical ladder before being directly under the company's owner or president. Conversely, service lines follow a more horizontal continuum approach, where the company is strategically segmented into more manageable departments. The service line approach tends to focus more on the requirements of customers, which often results in noticeable increases in the customer satisfaction rate.

What is Application Development?

Application development goes through a process of planning, creating, testing, and deploying an information system, also known as the software development lifecycle. Applications are also often developed to automate some type of internal business process or processes, build a product to address common business challenges, or drive innovation.

What is Application Maintenance?

Application maintenance is the continuous updating, analyzing, modifying, and re-evaluating of your existing software applications. Application maintenance must be an ongoing task to ensure your applications are always running to the best of their abilities. Due to evolving customer expectations, the fight to survive in an existing market, and technological advancements, modifying and implementing new strategies is critical in maintaining sustainability and staying competitive. Every competitive business needs to constantly enhance and manage the IT solutions that have been developed in order to stay relevant and meet the wavering needs of users. This is where application maintenance and support come into the picture.

Contrary to popular belief, application maintenance is not just about fixing defects, but modifying a software product after delivery to correct faults, as well as to improve performance. Application maintenance and enhancement to existing applications begin with a thorough study of existing applications to identify areas of improvement.

Tips for Successfully Carrying Out Application Development and Maintenance

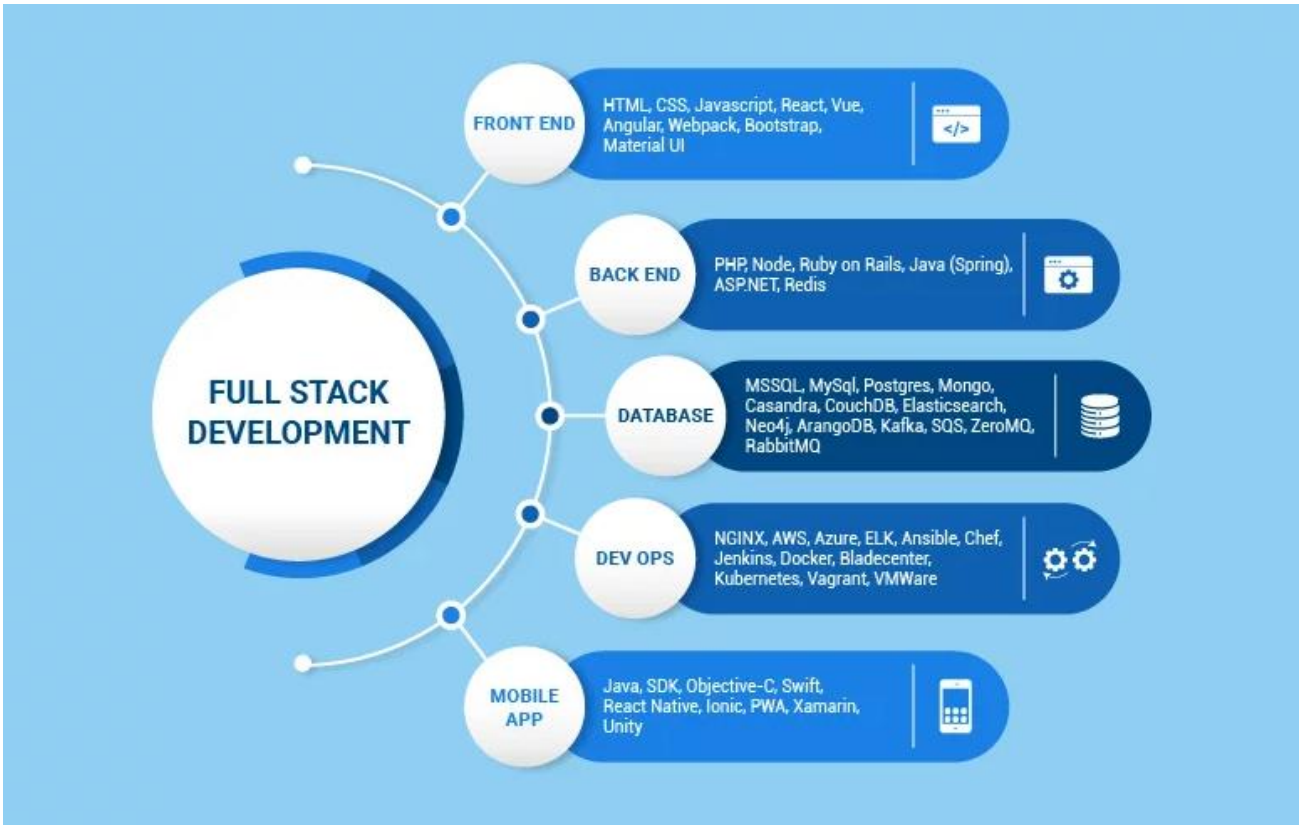
Great user experience to end customers through the development and maintenance of modern apps is a must-have. Today, applications (web or mobile) are the most cost-effective and powerful ways to reach out to a vast market and generate revenues. With millions of applications being rolled out every day, it's a good idea to keep in mind a few tips:

- Be as clear as possible as to what your requirements for your application are
- Thoroughly understand the services offered by application development companies and identify the right partner if you're using a partner
- Evaluate the various development platforms and choose the one that best fits the needs of your business

- Make sure to embed processes that focus on continuous improvements and iterations to add new features and/or fix bugs
- When developing your application, make security your top priority
- Regularly update and test your application to deliver improved and better performance, high security, and a bug-free, seamless user experience

What is Full Stack Development?

Full Stack Development (FSD) is a software development process that includes both the front and back end. To that end, a Full Stack Developer may design and create the front end while simultaneously designing, developing, and debugging databases and the software's backend. There are two significant components to full-stack application development. Development of the Front End and Back End.



Roles and Responsibilities of a Full Stack Developer

A full stack developer is responsible for both the front-end and back-end aspects of a web application. The specific roles and responsibilities can vary depending on the size of the development team and the complexity of the project, but some common responsibilities include:

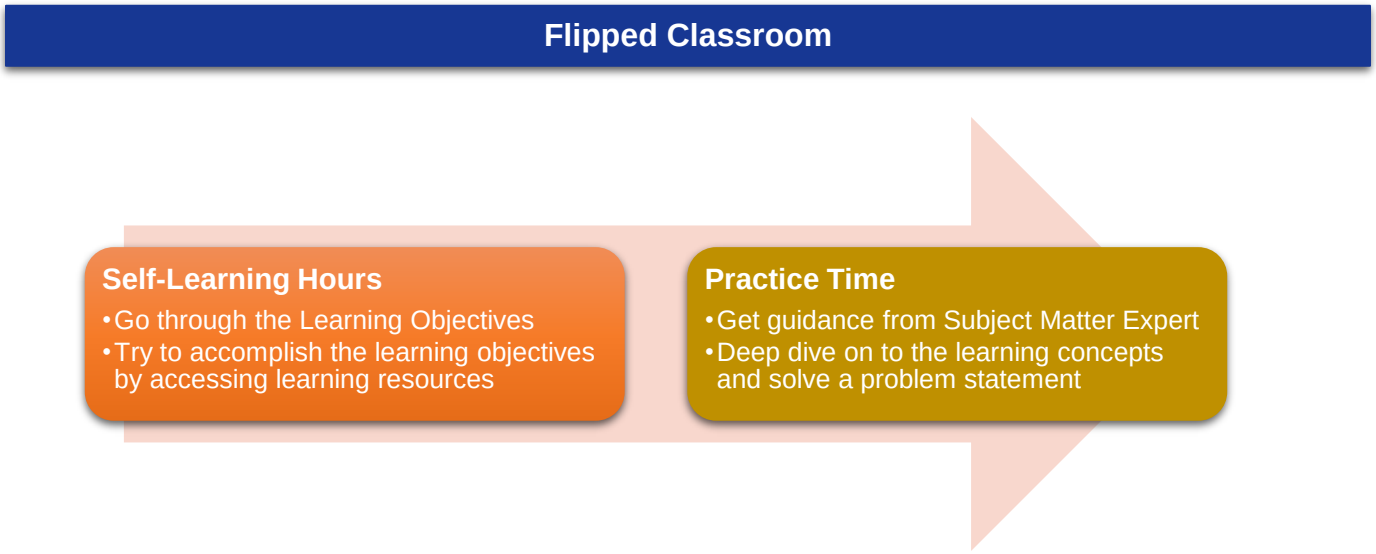
1. Design and develop end-to-end web applications.
2. Implement front-end and back-end components using relevant technologies (e.g. HTML, CSS, JavaScript, React, Node.js, etc.).
3. Write clean, efficient, and well-documented code.
4. Debug and resolve technical issues.
5. Collaborate with the team and other stakeholders to deliver project on time.
6. Stay up-to-date with the latest technologies and industry trends.
7. Write automated tests to ensure code quality and improve application reliability.

8. Develop and maintain databases, servers and application deployment infrastructure.
9. Manage code repositories and version control systems (e.g. Git).
10. Participate in code reviews to ensure high-quality code.
11. Contribute to the architecture and design of applications.
12. Collaborate with designers, product managers, and other stakeholders to understand the requirements and build solutions that meet them.

Learning Journey through Flipped Classroom

This program encourages you to be more autonomous learners during out-class self-learning hours, completing the learning objectives on your own pace and style, and get ready for the in-class practice time.

The learning path is set in the GEN C Learn Platform, which you can login with SSO.

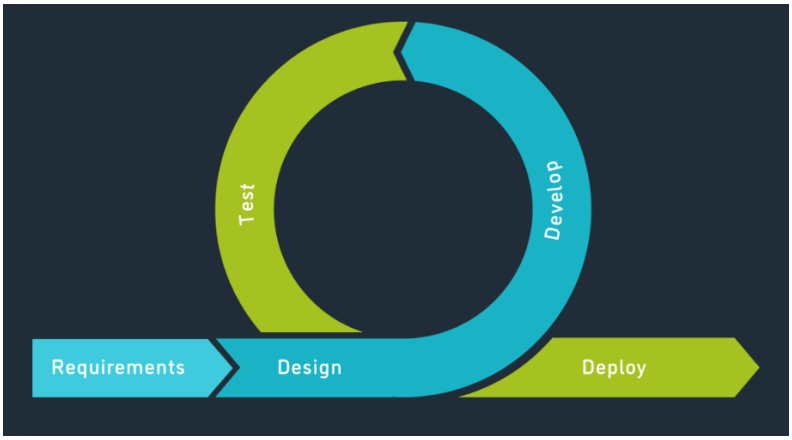


Integrated Development Project (IDP)

What is Integrated Development Project (IDP)?

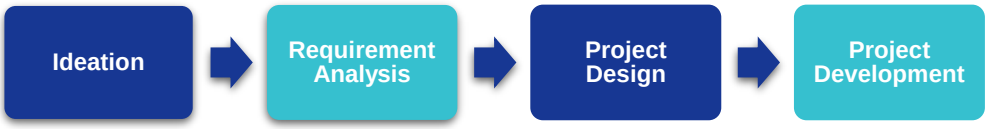
Integrated Development Project is an approach wherein the learner experiences the entire software development processes in an incremental fashion as part of the GenC Training. The IDP implementation is purely based on **Agile Software Development** methodologies and inspired from **PBL (Project-Based Learning)** which is learning while doing. It gives learners the opportunity to gain a deeper understanding of a topic through problem-solving using real-world examples and challenges.

Following is the Agile Development Methodology at high-level.



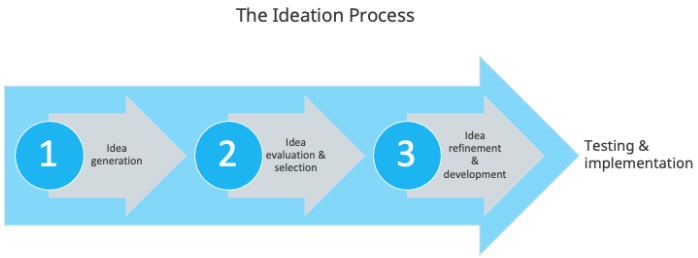
Stages of IDP

Following are the four seminal phases of IPD.



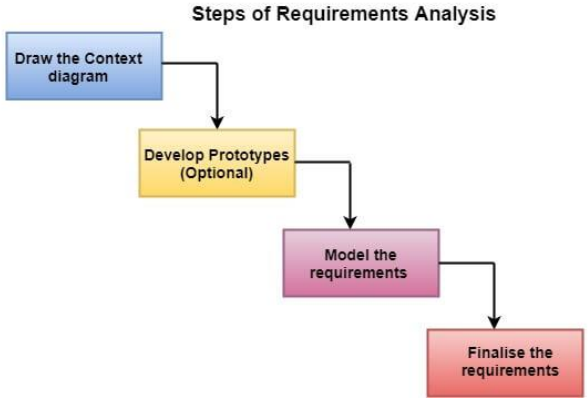
Phase 1: Ideation

Ideation is the creative process of generating, developing, and communicating ideas. It's important to note that these ideas don't have to be completely new. You can ideate to solve specific problems, look into new ways of implementing a solution, or even collect feedback and evaluate ideas.



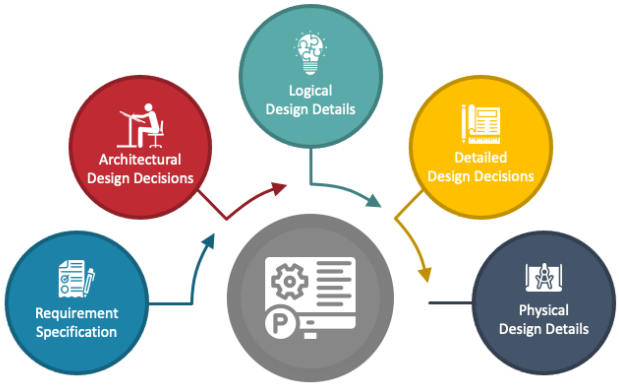
Phase 2: Requirement Analysis

Requirements analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications.



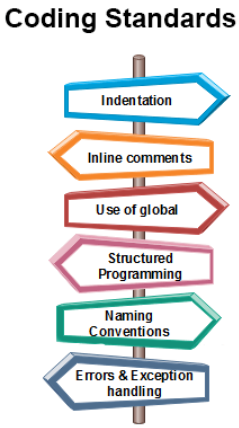
Phase 3: Project Design

Project design is a process to transform user requirements into some suitable form, which helps the programmer in software coding and implementation.



Phase 4: Project Development

Once the system design phase is over, the next phase is development. In this phase, developers start build the entire system by writing code using the chosen programming language. In this phase, tasks are divided into units or modules and assigned to the various developers. It is the longest phase of the Software Development Life Cycle process.



Recommended Program Sequence

The learning journey starts with **5 days of Icebreaker sessions, 1 day of Agile Workshop** followed by a technical learning that contains **4 stages** and they are the following:

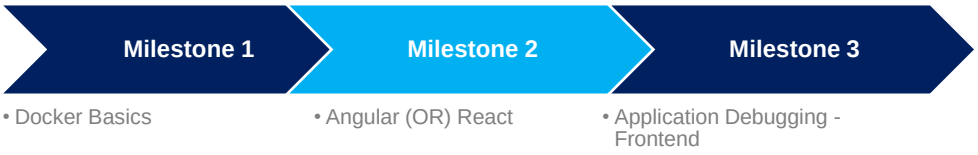
- Stage 1 - Core Programming Fundamentals
- Stage 2 - Application Frameworks
- Stage 3 - FSE Skills - Part 1
- Stage 4 - FSE Skills - Part 2
- Integrated Development Project (IDP)

Stage 1: Core Programming Fundamentals

Stage 2: Application Frameworks

Stage 3: FSE Skills - Part 1

Stage 4: FSE Skills - Part 2



All the 4 stages would be executed in the **Flipped classroom model** through Learning paths configured on the **Tekstac** platform.

There will be an integrated project called **IDP** (Integrated Development Project) which will be executed in an incremental fashion and is part of all the 4 stages.

Key Learning and Evaluation Components of the Program

Self-Learning via Udemy

Cognizant has collaborated with **Udemy** to provide world class learning videos for the evolving future of work. These Udemy programs are woven into a learning path, empowering you to plan and learn at your style.

The program also connects you with **Subject Matter Experts (SMEs)** to get the professional guidance on your queries in the learning journey.

The program doesn't ONLY concentrate on the technical skilling, but also on the shaping up of the behavioral skills. **32 hours of Behavioral learning** would be done in ILT mode, with few Self-paced learning modules too.

GenCs will undergo evaluation at the end of Stage 1 of their learning in the form of a skill-based qualifier assessment. At the conclusion of Stage 3, there will be an interim evaluation during which learners will be assessed based on the technical skills covered up to that point and their progress in project deliverables. Towards the end of Stage 4, a final evaluation will take place, which will cover the entire scope of the training.

Program Completion Criteria

RAG as PHS (Performance Health Status)

The program continuously evaluates if you are able to apply those self-learnt skills to solve a real-time business problem. Depicted below are the two key learning components, which are distributed across the learning journey for the purpose of continuous evaluation.

Interim Evaluation:

During the interim evaluation, the GenC will undergo a video interview on the learning platform. This interview will be conducted by a Tech SME from the BU. The purpose of this evaluation is to assess the GenC's knowledge and understanding of the skills covered in the training program up to the halfway point. It also encompasses an evaluation of the GenC's progress in their Integrated Development Project (IDP). The evaluation will involve a technical discussion as well as an assessment of the IDP progression to gauge the GenC's proficiency in the skills learned thus far.

Final Evaluation:

For the final evaluation, the GenC will participate in a video interview conducted by a Tech SME from the BU. This evaluation aims to assess the GenC's knowledge and expertise in all the skills covered throughout the entire training program. Similar to the interim evaluation, this assessment will involve a technical discussion via a video interview on the learning platform, along with a project evaluation to assess the GenC's capabilities and their IDP's progress. It serves as a comprehensive evaluation of the GenC's skills and capabilities acquired during the training.

The above evaluation components will attribute to the **Performance Health Status (PHS)** of a GenC. Additional Learning Components like Hands-On, Quizzes, CCs, and ICTs will help you to enhance your expertise level.

Mandatory Hands-On Exercise Completion

Completion of 100% of the hands-on exercises is mandatory to qualify for the stage 1 qualifier, interim, and final evaluations.

Icebreaker Sessions

Icebreaker session will be conducted for a duration of initial **5 days**. During the session, various topics related to Corporate Induction, Talent Management, Cognizant Agenda on Core Values, Leader Talks, Alumni, BU Mentor connects will be covered. Followed by icebreaker, technical training will kick start.

Following sessions will be covered during the 5 days of icebreaker

- Corporate Induction
- Talent Manager Connect
- Cognizant Agenda Sessions on Core Values
- Leader Talks (Academy) and many more…

Learning Recommendation

A recommended day-wise schedule is provided below for the learning, with the learning content for the day, the practice hands-on and extended hands-on to be done for the day or any other activities are listed.

Stage 1 – Foundational Technology Skills

Stage 1 deals with foundational technology skills that help GenCs to get start with their software engineering career. We provide unique learning experience to learners by including diversified learning content and learning methodologies that are based on adult learning principles. At the end of this stage, there will be a **Qualifier Assessment** which determines the direction of the learning journey of a GenC at Cognizant.

As part of Stage 1 of your training, the following skills will be covered.

- HTML5, CSS3 and JavaScript
- Bootstrap, JQuery
- ANSI SQL using MYSQL

- Core Java

How and From Where to Learn?

- Udemy learnings are recommended in the Platform to understand the fundamental concepts. In addition to this, you can also learn from any other sources as they are mentioned in this handbook.

Integrated Development Project (IDP) Roadmap

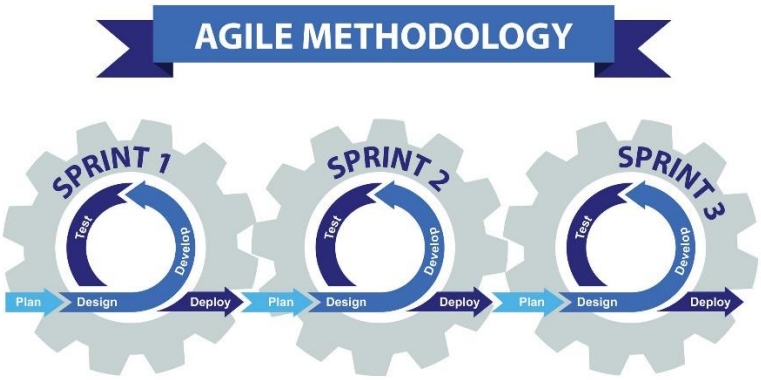
Phases	Duration	Activities	Deliverables
Phase1: Ideation/Brainstorm	6 Days	1. Project Ideation by Forming the PoD 2. Conducting various brainstorming sessions and generate project ideas 3. Finalize the project idea	1. Project abstract and a title

Agile Fundamentals

Day 1

What is Agile?

Agile is a set of principles that are used to improve the process of project management and software development. To put in simple terms, Agile helps teams in delivering value to customers quickly and effortlessly.



Agile Principles

Here is a sneak peek into some of the principles that help make the Agile Process what it is:

1. **Customer satisfaction:** Customers need to be satisfied with the quick delivery of the product at the earliest.
2. **Welcome change:** Even if the change is late in the development process, it needs to be addressed and handled as soon as possible.
3. **Deliver frequently:** The focus must be on the continuous delivery of software in a shorter timescale.
4. **Work together:** Business units and developers need to work in tandem throughout the project lifespan.
5. **Motivated team:** The projects need to have motivated team members. They must also be trusted to get the work done.
6. **Face-to-face:** Conversations that take place face-to-face have maximum efficiency and effectiveness.
7. **Working software:** The primary measure of progress is evaluated based on the working software created.
8. **Constant pace:** The agile process is greatly beneficial when it comes to sustainable development.
9. **Good design:** Focusing on technological excellence and good design can significantly affect agility.
10. **Simplicity:** The amount of work not being done needs to be reduced via simpler processes.
11. **Self-organized:** Self-organized teams end up providing the best architectures, designs, and requirements.
12. **Reflection and adjustment:** The effectiveness can be significantly improved by regular reflection on it, by the team.

What Are the Advantages of the Agile Process?

- Thanks to agile, there will be plenty of interaction between the project team and the clients.
- The clients can have greater insight into every phase of the project, due to improved transparency.
- The outputs are easily predicted, and can sometimes be delivered faster than expected.
- Most projects follow a rigid schedule and can incur predictable costs.
- Agile enables changes that can empower the product catalog to be refined and reprioritized.
- The maximum project value can be ensured since the client can decide the priorities of the features.
- By understanding the needs of the customer, the team can provide more value effortlessly.
- Since the project is broken down into smaller units, development, testing, and collaboration will be of the highest quality.

Learn about Agile process from the below Udemy course.

Agile Crash Course: Agile Project Management; Agile Delivery

Software Development Life Cycle - Overview

What is SDLC?

SDLC is a process that defines the various stages involved in the development of software for delivering a high-quality product. SDLC stages cover the complete life cycle of a software i.e. from inception to retirement of the product.

Adhering to the SDLC process leads to the development of the software in a systematic and disciplined manner.

Purpose

Purpose of SDLC is to deliver a high-quality product which is as per the customer's requirement.

SDLC has defined its phases as, Requirement gathering, Designing, Coding, Testing, and Maintenance. It is important to adhere to the phases to provide the Product in a systematic manner.

For Example, A software has to be developed and a team is divided to work on a feature of the product and is allowed to work as they want. One of the developers decides to design first whereas the other decides to code first and the other on the documentation part.
This will lead to project failure because of which it is necessary to have a good knowledge and understanding among the team members to deliver an expected product.

SDLC Cycle

SDLC Cycle represents the process of developing software.

SDLC Phases

Given below are the various phases:

- Requirement gathering and analysis
- Design
- Implementation or coding
- Testing
- Deployment
- Maintenance

1) Requirement Gathering and Analysis

During this phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only.

Business analyst and Project Manager set up a meeting with the customer to gather all the information like what the customer wants to build, who will be the end-user, what is the purpose of the product. Before building a product a core understanding or knowledge of the product is very important.

For Example, A customer wants to have an application which involves money transactions. In this case, the requirement has to be clear like what kind of transactions will be done, how it will be done, in which currency it will be done, etc.

Once the requirement gathering is done, an analysis is done to check the feasibility of the development of a product. In case of any ambiguity, a call is set up for further discussion.

Once the requirement is clearly understood, the SRS (Software Requirement Specification) document is created. This document should be thoroughly understood by the developers and also should be reviewed by the customer for future reference.

2) Design

In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.

3) Implementation or Coding

Implementation/Coding starts once the developer gets the Design document. The Software design is translated into source code. All the components of the software are implemented in this phase.

4) Testing

Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned to developers to get them fixed.

Retesting, regression testing is done until the point at which the software is as per the customer's expectation. Testers refer SRS document to make sure that the software is as per the customer's standard.

5) Deployment

Once the product is tested, it is deployed in the production environment or first UAT (User Acceptance testing) is done depending on the customer expectation.
In the case of UAT, a replica of the production environment is created and the customer along with the developers does the testing. If the customer finds the application as expected, then sign off is provided by the customer to go live.

6) Maintenance

After the deployment of a product on the production environment, maintenance of the product i.e. if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developers.

Stage 1: Milestone 1 - User Interface Design

Overview

Milestone 1 will be focusing on UI & Scripting Technologies such as HTML5, CSS3, JS, Bootstrap and jQuery that are essential while developing a UI in various web application development and maintenance scenarios.

HTML5 is a markup language used for structuring and presenting content on the World Wide Web. It is the fifth and final major HTML version that is a World Wide Web Consortium recommendation. The current specification is known as the HTML Living Standard.

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

JavaScript, often abbreviated as JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for webpage behavior, often incorporating third-party libraries.

Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains HTML, CSS and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.

jQuery is a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax. It is free, open-source software using the permissive MIT License. As of Aug 2022, jQuery is used by 77% of the 10 million most popular websites.

Performance Outcomes

After completing this milestone, GenCs will be able to

- Define HTML and common terminology related to HTML, recognize correct HTML syntax, and Write a brief error-free HTML code.
- Should be able to apply style to an existing/new web page as per the requirement using CSS3.
- Should be able to write and employ JavaScript code to solve practical web design problems.
- Should be able to make responsive, cross-platform and modern websites using Bootstrap4.
- Should be able to illustrate animated, interactive web pages using jQuery libraries.

Courses/Skills	Learning Duration	Practice Duration
• HTML5, CSS3 and JavaScript	• 12 hrs.	• 8 hrs.
• Bootstrap	• 8 hrs.	• 8 hrs.
• jQuery	• 8 hrs.	• 4 hrs.

Day 2

HTML5, CSS3

Learn the basics of HTML5 & CSS3

About HTML5 (Computer application)
HTML5 is a markup language used for structuring and presenting content on the World Wide Web. It is the fifth and final major HTML version that is a World Wide Web Consortium recommendation. The current specification is known as the HTML Living Standard Learn about Top 10 New Features of HTML5 - Click Here HTML5 **Cheat Sheets** - Click Here

About CSS3 (Programming language)
Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. What is CSS3 - Click Here CSS3 **Cheat Sheets** - Click Here

Learn and Practice

Responsive Web Design: HTML5 + CSS3 for Entrepreneurs 2018

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Lets Learn Some HTML 5
  - CSS3 & First Project
- Implement the examples along with the author.

Hands-on

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Simple Calculator
- Learning Material Styling
- Feedback Details
- Bill Calculator
- Trainer Feedback Rating Chart

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on HTML5, CSS3.

- Quiz 1 - HTML 5 & CSS3

Code Challenge (For Practice Only)

Attempt the following Code Challenge through the Learning Path at Tekstac for checking your skill level on HTML5 and CSS3. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge - HTML5 and CSS3

Day 3

JavaScript

Learn the basics of JavaScript

About JavaScript (Programming language)
JavaScript, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for webpage behavior, often incorporating third-party libraries. An Introduction to JavaScript - Click Here JavaScript **Cheat Sheets** - Click Here

Learn and Practice

Javascript basics for beginners

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Getting Started
    - Basics
    - Operators
    - Control flow
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Greetings - DOM
- Fixed And Reducing Interest Loan Estimator
- Word Play - Operators, Conditional Control Statements & Loops
- Find Unique Characters - Functions

Additional Hands-On

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Rate Card For Boat Riding
- ACTB connection portal
- EMI Calculator
- Validate Pan Card - DOM

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on JavaScript.

- Quiz 2 - JavaScript

Additional Learning

Go thru the Udemy course in order to understand the usage of Chrome Developer Tools which is a comprehensive toolkit for developers, built directly into the Chrome browser. These tools let you edit web pages in real time, diagnose problems more quickly, and build better websites faster.

Devtools Pro: The Basics of Chrome Developer Tools

- Learn the sections listed below in this Udemy course

Day 4

Javascript basics for beginners

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Control flow
  - Objects

Go through **W3Schools** web pages for learning below specific topics

Form Validation

- JavaScript Form Validation
- JavaScript can validate numeric input
- Data Validation

String Methods

- String Length
- The substring() Method
- String.trim()

JavaScript HTML DOM

- The HTML DOM (Document Object Model)
- What is DOM?
- What is the HTML DOM?

Window alert() Method

- Definition and Usage
- Example

Javascript Arrays

- All topics except Associative Arrays

JSON

Regular Expression

Regular Expression

isNan() function

indexof function

Go through **javascript-coder.com** web page for learning form submission

javascript-coder.com JavaScript Form Submit Example

- Refer code example in this web page

Hands-on

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Placing Order For Cake - String & Math
- Validate Email - Regular Expression & test Function
- Employee Experience Details - Class and Object & Date

Additional Hands-on

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Electricity Bill Calculation - Operators & Conditional Control Statements
- Prime Number Check - Operators, Conditional Control Statements & Loops

Additional Learning

Go through web pages for learning below specific topics

- HTML5 Events
- HTML5 - Geo location
- HTML5 - Geo location
- HTML5 - Web Storage
- HTML5-Web SQL Database
- WEB Forms 2.0

Code Challenge (For Practice Only)

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on JavaScript. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge - JavaScript

Evaluate Yourself!!!

Now, it's time to **Refer… Relate… Relish**

You have just finished the Core Web Technologies such as HTML5, CSS3 and JavaScript. How about applying your knowledge in certain **real-time scenarios**???

You need not consider this activity as a mandatory hands-on or your code challenge. Consider this as a Do-it-yourself and complete.

Here is the link. **PLEASE Go through and keep yourself always updated!!!**

Day 5

jQuery

Learn the basics of Jquery

About jQuery (Software)

jQuery is a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation, and Ajax. It is free, open-source software using the permissive MIT License. As of May 2019, jQuery is used by 73% of the 10 million most popular websites.

Why we use jQuery in our web application? - Click Here

jQuery **Cheat Sheets** - Click Here

Learn and Practice

The Complete jQuery Course: From Beginner To Advanced!

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Section 1: Introduction
    - Section 3: Element Selectors
    - Section 4: Manipulating the DOM I – Inserting, Replacing and Removing Elements
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Load jQuery
- Welcome Message

Day 6

jQuery

Learn the basics of jQuery

Learn and Practice

The Complete jQuery Course: From Beginner To Advanced!

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Section 5: Manipulating the DOM II – Changing
    - Element Data and CSS
    - Section 6: Events I – Handling Mouse Events & Keyboard Events
    - Section 7: Events II – Forms
- Implement the examples along with the author.

Go through the below mentioned topics on JQuery Ajax

Introduction

Load()

Post()

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Three Divisions
- Select the Boxes
- Customer Data
- Vertical Menu
- Get JSON Data
- Error Message
- Login Form
- Alternate Rows - Selectors
- Ice Cream Flavours - Selectors

Additional Hands-on

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Change Case - Selectors
- Missing Values -Selectors
- Describe Yourself - Selectors
- Rectangle Click - Events
- Jelly Beans – Events

Day 7

Bootstrap

Learn the basics of Bootstrap

About Bootstrap (Front-end framework)

Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains HTML, CSS and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.

Introduction to Bootstrap 4 - Click Here

Bootstrap **Cheat Sheets** - Click Here

Learn and Practice

The Bootstrap 4 Bootcamp

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Getting Started With Bootstrap 4
    - Bootstrap 4 Basics
    - Super Useful Utilities
    - Forms
- Implement the examples along with the author.

Note: You can use Visual studio code to practice Bootstrap hands-on on local machine

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Contact US
- BS Feedback Form

Additional Hands-on

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Bootstrap Typography

- Bootstrap Panel
- Nested Containers

Additional Learning

- RWD Introduction
- Media Queries
- RWD Viewport

Learn about Visual Studio Code which is a streamlined code editor with support for development operations like debugging, task running, and version control.

Beginner VS Code

Day 8

Bootstrap

Learn the basics of Bootstrap

Learn and Practice

The Bootstrap 4 Bootcamp

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Navbars and Flexbox!
    - The Magical Grid System
    - Cards and List Groups
- Implement the examples along with the author.

Go through web pages for learning below specific topics

- Overriding Bootstrap Styles

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Bootstraps Navigation Bar
- Page Layout
- Responsive Web Page

Additional Hands-on

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Bootstrap Responsive Grids
- Scrum Cards - Responsive Grid
- Bootstrap Badges and GMIs
- Bootstrap Cards
- BS Loan Request Form
- Overriding Bootstrap Styles

Stage 1: Milestone 2 - SQL Programming

Overview

Milestone 2 will be focusing on SQL Programming using MYSQL, which is essential for accessing and manipulating databases.

Performance Outcomes

After completing this milestone, GenCs will be able to

- Should be able to interpret the entities and relationships and create simple tables in database
- Should be able to describe relationships between tables and write simple queries to retrieve data from the database
- Should be able to perform CRUD operations using various types of statements, joins, subqueries

Courses/Skills	Learning Duration	Practice Duration
• SQL Programming using ANSI SQL	• 8 hrs.	• 8 hrs.

Day 9

Database design

DDL Commands, DML Commands

Learn and Practice

SQL for Beginners: Learn SQL using MySQL and Database Design

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.

- Installation and Setup
- Data Definition Language
- More On Alter Table
- Data Manipulation Language
- Selecting from a Table

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the solution. Write the query yourself.

- Insert Records – Department
- Department name based on block number
- Student and their Department Based on City
- Hunger eats - update table
- Delivery Partner details based on rating
- car rental system - Insert values
- Customers having gmail id
- Car details based on type and name
- Car & owner details based on car type

Additional Hands-On

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the solution. Write the query yourself.

- Car rental system - Create Table
- Car rental system - add new column
- Hunger eats - change datatype
- Hunger eats - Change the field name

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Database design.

- Quiz 1 - Database concepts

Day 10

ANSI SQL

Operators, Aggregate, String, Date Functions

About SQL (Programming language)
SQL is a domain-specific language used in programming and designed for managing data held in a relational database management system, or for stream processing in a relational data stream management system. Introduction to ANSI SQL - Click Here SQL **Cheat Sheets** - Click Here

Learn and Practice

SQL for Beginners: Learn SQL using MySQL and Database Design

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Selecting From Multiple Tables
  - Database Design
  - Aggregate Functions
  - Subqueries

Relational Database Design

- Learn ALL sections in this Udemy course

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the solution. Write the query yourself.

- Concatenating Details
- Hotels that took order based on month
- Hotel_info
- Rental details based on date
- Password Generation
- Customer using HDFC bank

Additional Hands-On

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the solution. Write the query yourself.

- Total sale daywise
- Hotels that took order more than five times
- Credential details
- Maruthi car owner details
- Cars not taken for rent
- No of time rented by each car
- Customer mail details
- Order details
- Hotels not taken orders in a specific month
- Number of Tickets Booked
- Buses based on Source and Destination

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on ANSI SQL.

- Quiz 2 - ANSI SQL

Additional Learning

- Please go thru the links on **SQL Rank function** and **Introduction to NoSQL** in the platform

Code Challenge (For Practice Only)

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on ANSI SQL. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

Do not copy paste the solution. Write the query yourself.

- Code Challenge - RDBMS Select Statements
- Code Challenge - RDBMS DDL & DML
- Code Challenge - Function-Scalar & Aggregate
- Code Challenge - Functions & SubQueries

Evaluate Yourself!!!

Now, it's time to **Refer… Relate… Relish**

You have just finished the SQL learning. How about applying your knowledge in certain **real-time scenarios???**

Learn what, why and how aspects about the core concepts of SQL.

Here is the link. **PLEASE Go through and keep yourself always updated!!**

Overview

Milestone 3 will be focusing on Java Programming Fundamentals.

Performance Outcomes

After completing this milestone, GenCs will be able to

- Should be able to develop a simple component or module using Java language, following a component design specification
- Should be able to demonstrate the Object Orientated Programming Concepts, Packages, Interfaces, Abstract Classes, Inner Classes
- Should be able to analyze and implement the Exception Handling, Strings, I/O, Collections and Generics, Standard Libraries (java.lang, java.util)
- Should be able to use Multithreading for a simple scenario
- Should be able to use JDBC to access DB and perform basic operation
- Should be able to apply Java 8 features Lambda Expressions
- Should be able to use the Java 8 feature, Method references in the programming
- Should be able to use the concepts of Functional Interfaces, Default methods
- Should be able to apply Streaming API in programming concepts
- Should be able to use Optional class in programming concepts
- Should be able to explain the concepts of Parallel sort in programming
- Should be able to apply Java 11 and 12 features.

Courses/Skills	Learning Duration	Practice Duration
• Core Java	• 40 hrs.	• 44 hrs.

Day 11

Core Java

Overview, First Java Program, Variables, Datatypes, Literals, Operators, Expressions and Conditional Statements.

Definition, Meaning and Features of Java Platforms

What is Java?

Java is a general-purpose, class-based, object-oriented programming language designed for having lesser implementation dependencies. It is a computing platform for application development. Java is fast, secure, and reliable, therefore. It is widely used for developing Java applications in laptops, data centers, game consoles, scientific supercomputers, cell phones, etc.

What is Java Platform?

Java Platform is a collection of programs that help programmers to develop and run Java programming applications efficiently. It includes an execution engine, a compiler, and a set of libraries in it. It is a set of computer software and specifications. James Gosling developed the Java platform at Sun Microsystems, and the Oracle Corporation later acquired it.

Definition and Meaning

Java is a multi-platform, object-oriented, and network-centric language. It is among the most used programming language. Java is also used as a computing platform.
It is considered as one of the fast, secure, and reliable programming languages preferred by most organizations to build their projects.

What is Java used for?

Here are some important Java applications:

- It is used for developing Android Apps
- Helps you to create Enterprise Software
- Wide range of Mobile java Applications
- Scientific Computing Applications
- Use for Big Data Analytics
- Java Programming of Hardware devices
- Used for Server-Side Technologies like Apache, JBoss, GlassFish, etc.

Learn and Practice

Java In-Depth: Become a Complete Java Engineer!.

- Java: A High-level Overview
- Skip installation steps.
- Implement the HelloWorld Program along with the author.

Core Java Made Easy (Covers the latest Java 17).

- Datatypes, Literals, Variables, Type Conversion, Casting & Promotion
- Operators and Assignments
- Flow Control Statements
  - Flow Control Statements Introduction
  - IF-ELSE
  - Assignment 2: If Else Ladder

* Please refer the link for providing the user inputs from the console for Java samples.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Display Characters
- Fuel Consumption Calculator
- Highest Placement

Additional Hands-On

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Bill Generation
- Movie ticket calculation

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Java fundamental concept.

- Quiz 1 - Java Operator, Control flow statement

Day 12

Core Java

Overview, String, Arrays, Looping Statements, Methods, Class, Object, static.

Learn and Practice

Core Java Made Easy (Covers the latest Java 17).

- Flow Control Statements
  - Switch,While,Do-While,For Loop, Break, Continue
- Static Members and their execution control flow.
- Non-Static Members and their execution control flow.

Java In-Depth: Become a Complete Java Engineer!.

- Classes, Objects and their Members.
  - Chapter Introduction
  - Class & Objects

Core Java Made Easy (Covers the latest Java 17).

- String Handling
- Arrays

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Least offer
- String Concatenation
- Ticket Price Calculation – Static
- Student Details - Constructor

Additional Hands-on

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Increment Calculation
- Find Average Age

Day 13

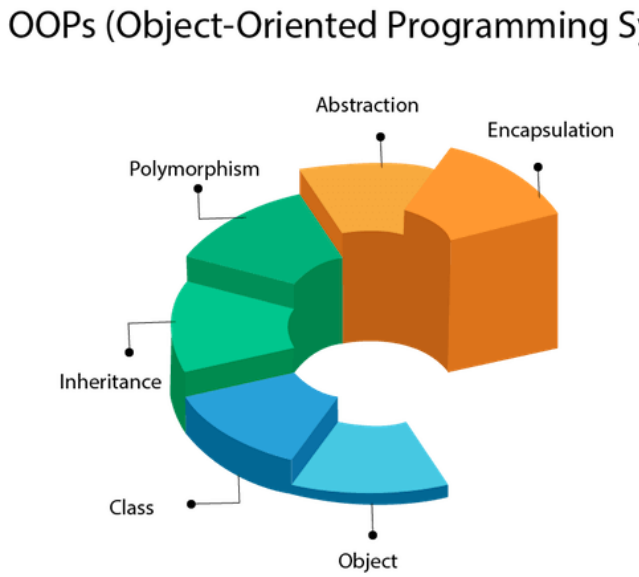
Core Java

Access Modifiers, Packages, Inheritance, Abstraction.

Object Oriented Programming (OOPs) Concept in Java

What is Object Oriented Programming?

As the name suggests, Object-Oriented Programming or OOPs refers to languages that use objects in programming, they use objects as a primary source to implement what is to happen in the code. Objects are seen by the viewer or user, performing tasks assigned by you. Object-oriented programming aims to implement real-world entities like inheritance, hiding, polymorphism etc. in programming. The main aim of OOP is to bind together the data and the functions that operate on them so that no other part of the code can access this data except that function.



Read more about OOPs in Java from here.

Learn and Practice

Core Java Made Easy (Covers the latest Java 17).

- Go through below mentioned sections and implement the examples along with the author.
  - Access Modifiers
  - Packages
  - Event Management Use case
  - Inheritance
  - Abstraction

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Contact Details of Hosteller
- Account Manipulation - Abstract class

Additional Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Shape - Area Volume Calculator

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Object oriented programming concept.

- Quiz 2 - Applying Object Oriented Concepts in java

Day 14

Core Java

Polymorphism, Encapsulation, Interface, Object Methods

Learn and Practice

Core Java Made Easy (Covers the latest Java 17).

- Go through below mentioned sections and implement the examples along with the author.
  - Polymorphism
  - Encapsulation
  - Object class methods

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- BankAccountDetails
- Employee Loan Eligibility – Polymorphism
- Vehicle-Loan-Insurance - Use Interface

Day 15

Core Java

Collection Framework, ArrayList, Map, Set.

Learn and Practice

Core Java Made Easy (Covers the latest Java 17).

- Go through below mentioned sections and implement the examples along with the author.
  - Collections with Generics
    - Collections Introduction
    - List Introduction
    - ArrayList Hands On
    - Restricting the ArrayList Type
    - Inserting and Replacing Objects
    - addAll and contains Methods
    - size get and remove Methods
    - Set Introduction
    - Using HashSet
    - Different Set Classes
    - Iterator
    - ListIterator
    - Comparable and Comparator
    - Create a StringBuffer Comparator
    - Sort Strings by Length
    - Sorting Objects
    - Create a Object Comparator
    - Map Introduction
    - HashMap Demo
    - Arrays and Collections Classes
    - Collections Sort
    - Reversing a List
    - Arrays sort()
    - Array to List conversion
    - Generics
    - Generic class structure
    - Create your own Generic Class

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Insurance Bazaar
- Number of New Words
- Phone Book Manipulation

Additional Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Count of Each Words
- Book Manipulation

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Collections framework in Java.

- Quiz 3- Collections Framework

Code Challenge (For Practice Only)

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on Java basics. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

- Code Challenge - Group 1

Day 16

Core Java

File Handling, Annotation, Threads and Garbage Collections, Exception Handling, Enums.

Learn and Practice

Core Java Made Easy (Covers the latest Java 17)

- Go through below mentioned sections and implement the examples along with the author.
    - IO Streams (File IO)
        - IO Streams Introduction
        - Read a File Using FileInputStream
        - Copy A File using FileOutputStream
        - Using Reader And Writer
    - Java Annotations
        - Introduction
        - Using @Deprecated
        - Using @Override
        - Using @SuppressWarnings
    - Multithreading
    - Garbage Collection & Types Of Objects
    - Exception Handling and Assertions
    - Enums

Additional Hands-On

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Divide two numbers - Use finally

Go through the below mentioned topics.

- String Tokenizer
- Number Class
- Calendar
- Resource Bundle
- Currency
- Comparable Interface
- Math
- Class loader
- System
- Process
- Runtime

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Array Manipulation - Use try with multi catch
- Employee Promotion
- Register a Candidate - User defined Exception(with throw and throws)
- Retrieving Data from file

Additional Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Visitors Details
- Divide two numbers - Use finally

Additional Learning

SOLID Design Principles

In Object Oriented Programming (OOP), SOLID is an acronym, introduced by Michael Feathers, for five design principles used to make software design more understandable, flexible, and maintainable.

These principles are a subset of many principles promoted by Robert C. Martin.

Do you want to deep dive??

We recommend the following Udemy course to learn about SOLID design principles

SOLID principles, Need and benefits of Design patterns

Additional Learning

Java Design Patterns & SOLID Design Principles

- Section 1 SOLID Design Principles

Day 17

Core Java

Java 8 Features - Lambda Expressions, Streams, Filters, java.time.

Java 8 Features

What's new in Java 8?

Java 8 release from Oracle was a revolutionary release of the world's #1 development platform. It included a huge upgrade to the Java programming model as a whole along with the evolution of the JVM, Java language, and libraries in a coordinated manner.

This release included several features for Ease of use, Productivity, Improved Polyglot Programming, Security, and Overall improved performance.

Click here to read more.

Click here to solve real time queries using Java 8 features.

Learn and Practice

Core Java Made Easy (Covers the latest Java 17)

- Go through below mentioned sections and implement the examples along with the author.
  - Java 8 Features

Java In-Depth: Become a Complete Java Engineer!.

- Go through below mentioned sections and implement the examples along with the author.
  - Date & Time API ~ Covers Java 8 & also Legacy API

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Mall Parking System
- Validate Name
- Travel Agency
- Fruit Basket Estimation

Additional Hands-On

Complete the following set of additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Participant List Manipulation
- College Account

Day 18, 19

Core Java

Java 8 Features - Streams and Optionals. Asynchronous and Parallel Programming in Java 8

Go through web pages for learning below specific topics

- Serial Sort Vs Parallel Sort
- Asynchronous and Parallel Programming Ref1
- Asynchronous and Parallel Programming Ref2
- Streams Ref1
- Streams Ref2
- Streams Ref3
- Optional

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Employee Loan Eligibility

- Placement Enrollment Count
- Auditing

Technical Quiz

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on the advanced java concepts.

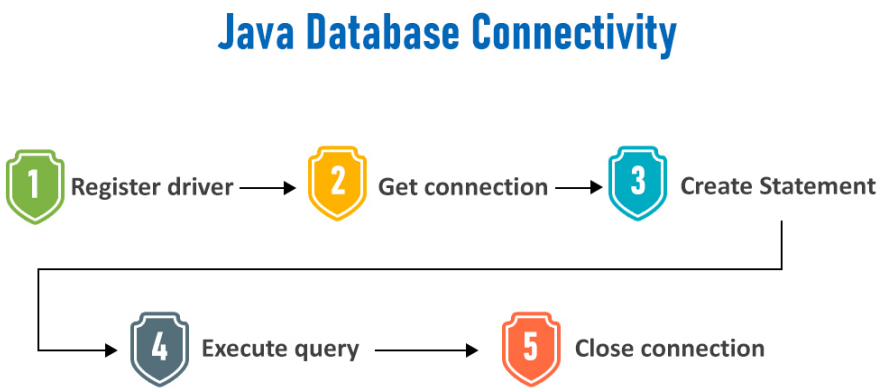
- Quiz 4- Advanced Java Concepts

Day 20

JDBC

Introduction, Connection, Statement, Prepared Statement, Callable Statement, Transactions and Meta Data.

What is JDBC?



The JDBC API is a universal data access mechanism that can be used by any program that uses Java. With the JDBC API, you can access almost any type of data source, such as relational databases and flat files. It also provides a common base for developing tools and alternate interfaces. After creating the connection, it can allow the programmer to access request statements and issue commands and handle result sets obtained from the database.

The process of things done within the Java application is summarized in three steps, and they are:

- Establishing a connection with a data source
- Send queries and update statements to the data source
- Processing the results

Click here to learn more about JDBC.

Learn and Practice

Java Database Connection: JDBC and MySQL.

- Go through entire course.
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Add Flight using JDBC
- Search for Trains – JDBC
- Player Selection System_JDBC

Additional Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Retrieve customer count based on loan type_JDBC
- Retrieve ID and Price of mobiles with in the range_JDBC

Day 21, 22

Java 11 and 12 Concepts

- Local-Variable Syntax for Lambda Parameters, Running Java file with single command, Nested Based Access Control, constantdynamic
  - Reference Link
- instanceof improvements
  - instanceof improvements

- Reading/Writing Strings to and from the Files, Switch Expression Enhancements, File mismatch method, Compact Number Formatting, Streams - teeing

Learn and Practice

Core Java Made Easy (Covers the latest Java 17)

- Go through below mentioned sections and implement the examples along with the author.
  - Java 11 Features
  - Java 12 Features

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- EB Connection - Switch Enhancements & Compact Number Formatting
- Holiday Homework - String Methods (Java 11)
- Association Details - String Methods (Java 12)
- School Bus allocation - File operations
- Minimum And Maximum Marks - Teeing Collector

Learn about the below given concepts thru the links provided.

JSON

- Overview
- Syntax
- Data Types
- Objects
- Stringify

YAML

- Introduction
- Basics

Day 23

Code Challenge (For Practice Only)

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on Java and JDBC. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge - Group 2

ICT (Integrated Capability Test) (For Practice Only)

Take up the following extended integrated practice task in order to check your skill level after completing the Stage 2 of your training. Unlike Code Challenge, the coverage of this practice will be MySQL, Java and JDBC. There will be only 3 attempts and you have to score a minimum 70% in order to complete this activity successfully.

Do not copy paste the code. Write the code yourself.

- Stage 1 ICT

Mock Qualifier

- Ensure that you take the mock qualifier before the actual one to become familiar with its pattern. You can attend the mock qualifier multiple times.

Evaluate Yourself!!!

Now, it's time to **Refer… Relate… Relish**

You have just finished the Core Java learning. How about applying your knowledge in certain **real-time scenarios???**

Learn what, why and how aspects about the core concept of the Java programming.

Here is the link. **PLEASE Go through and keep yourself always updated!!**

Stage 1: Qualifier

Day 24, 25

Stage 1 Qualifier Assessment

- These two days will be spent on the Qualifier assessment and result publishing.

IDP - Project Activities

Day 26, 27

IDP – Project Abstract Review

- These days will be utilized for IDP – Project Abstract review

Stage 2: Milestone 1 - Datastructures and Algorithm

Day 28

Data Structure

Linear Data Structure- Array, Linked list

Learn and Practice

Algorithms Data Structures in Java #1 (+INTERVIEW QUESTIONS)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.
    - Introduction
    - Arrays
    - Linked Lists

Day 29

Data Structure

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Array-DS
- 2D Array – DS
- left-rotation
- Sparse-Arrays
- Array Manipulation
- Mini-Max Sum
- Time Conversion
- Divisible Sum Pairs

Algorithm

Algorithm- Searching, Sorting, Pattern Searching

Learn and Practice

Algorithms Data Structures in Java #2 (+INTERVIEW QUESTIONS)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.
    - Substring Search
    - Strings
    - Basic Sorting Algorithm

Hands-On

Complete the following hands-on given in the Learning Path at Tekstac

.

Do not copy paste the code. Write the code yourself.

- Delete duplicate-value nodes from a sorted linked list

Stage 2: Milestone 2 - Spring Core, Maven

Day 30

Maven

Needs and benefits, Maven Project Creation, POM.xml, Build lifecycle, repositories, Scopes and Profiles.

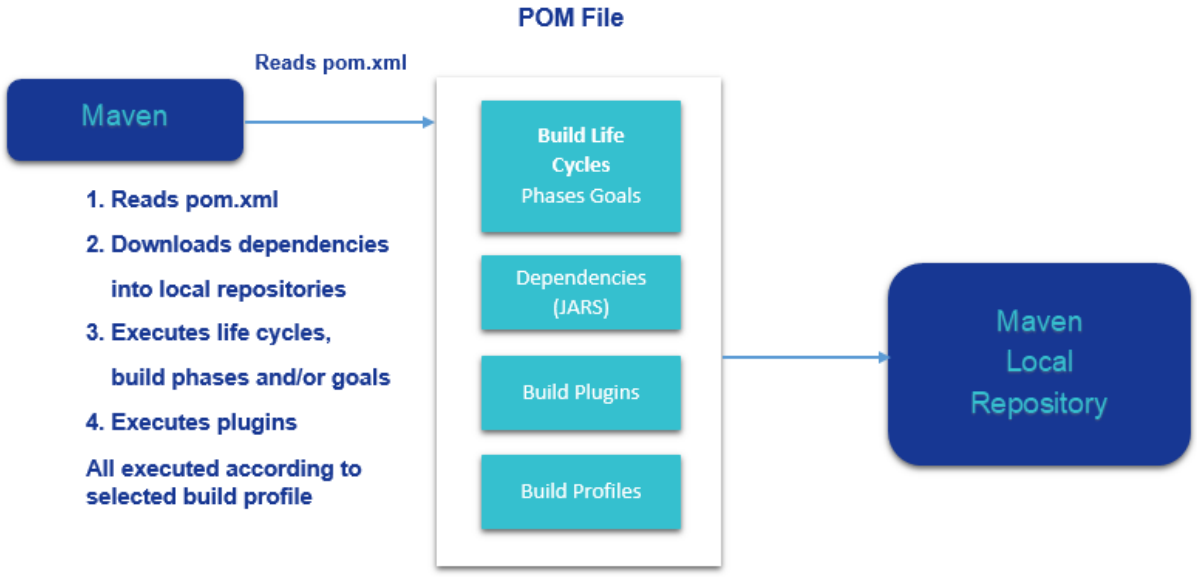
About Maven

What is Maven in Java?

Maven is a really strong project management tool that is used to build and manage any Java-related project. Maven helps in easing the job of a Java developer. It is capable of handling a project's build, reporting, and documentation.

Maven focuses on the simplification and standardization of the building process, taking care of the following:

- Builds
- Documentation
- Dependencies
- Reports
- SCMs
- Distribution
- Releases
- Mailing list



Click here to learn more about Maven.

Learn and Practice

Refer this document for Maven Installation and Web Project Creation.

Maven Crash Course

- Go through the below mentioned sections and perform maven build along with the author of this course.
  - Introduction
  - Maven Project Creation and Key Concepts
  - Scopes
  - Profiles

Additional Learning Reference

What are Design Patterns?

Design patterns are solutions to software design problems you find again and again in real-world application development. Patterns are about reusable designs and interactions of objects.

The 23 Gang of Four (GoF) patterns are generally considered the foundation for all other patterns. They are categorized in three groups: Creational, Structural, and Behavioral

Sounds interesting???

If you want to learn more about Design Patterns, feel free to walkthrough the below Udemy courses. As a matter of fact, every developers must know about these design patterns.

Java Design Patterns & SOLID Design Principles

- Section 3 to 10 Creational Design Patterns
- Section 11 Structural Design Patterns
- Section 19 Behavioral Design Patterns

Day 31

Core Spring

Setter Based Injection

About Spring Framework

What is Spring Framework?

Spring Framework is an open-source framework for building web applications with Java as a programming language. It is powerful and lightweight yet easy to use, and it provides support for developing Java applications easily. Spring is a lightweight framework which can be thought of as a framework of frameworks because it also offers support for various frameworks such as hibernate, struts, tapestry, and JSF.

Features of Spring Framework

Some of the most prominent features of the Spring Framework are:

- Predefined templates
- Easy to test
- Loose coupling
- Lightweight
- Fast development
- Powerful abstraction
- Offers an array of resources

- Declarative support
- Offers comprehensive tools

What is the Spring Container?

The Spring container is responsible for instantiating, configuring, and assembling the Spring beans. The container gets its instructions on what objects to instantiate, configure, and assemble by reading configuration metadata. The configuration metadata is represented in XML, Java annotations, or Java code. It lets you express the objects that compose your application and the rich inter-dependencies between those objects.

The responsibilities of IOC container are:

- Instantiating the bean
- Wiring the beans together
- Configuring the beans
- Managing the bean's entire life-cycle

Click here to learn more about Spring Core.

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Introduction
    - Software Setup
        - Troubleshooting Maven Projects
    - Setter Injection
        - Create a Maven Project
        - Create the Java Bean
        - Create the Spring Configuration
        - Create and run the test
        - Value as attribute
        - Using p:schema or p: namespace

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- DBConfig-SetterBasedInjection
- EZEE Transport

Core Spring

Injecting collections, dependency check, Inner Beans and Scope.

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Setter Injection
        - Injecting Collections
        - List - Create the Spring Bean
        - List - Create the Configuration file
        - List - Create the Test
        - Running the test and flow
        - Two More Things About List

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- CurrencyConverter-Collections (Refer section 4.34 and 4.35 of Udemy course to implement this hands on)

Day 32

Core Spring

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Dependency Check , Inner beans and Scopes

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Customer-Address-Scope
- Customer-Address Inner Bean

Core Spring

Constructor based Injection, Spring Core Concepts, Autowiring, Usage of Properties.

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
  - Constructor Injection
  - Spring Core Concepts
  - Using Properties

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac

Do not copy paste the code. Write the code yourself.

- Constructor Injection
- Engine Analysis

Day 33, 34

Core Spring

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
  - Auto-Wiring

Hands-On

Complete the following hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Autowiring

Core Spring

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
  - Stereotype Annotations
  - Injecting Interfaces

Spring Message Resource

- Spring Resource bundle with ResourceBundleMessageSource example

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- EBanking
- Passport Service

Additional Hands-On

Complete the following additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Patient Management

Core Spring – Good to Have Learning

Aspect Oriented Programming (AOP) using Spring AOP and AspectJ.

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
  - Spring AOP

Additional Hands-on

- Spring AOP Demo

Core Spring – Good to Have Learning

Spring JDBC

Learn and Practice

Spring Framework in Easy Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Spring JDBC

Additional Hands-on

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Billing Software Application
- EBill

Code Challenge (For Practice Only)

Attempt the following Code Challenge through the Learning Path for checking your skill level on Spring Framework. There will be only 3 attempts and you have to acquire 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge - Spring Framework

IDP - Project Activities

Day 35, 36

Use Case Documentation Review

- These days will be utilized for user case review and rework.

Day 37

JUnit

Writing basic tests, Assert Statements

Learn and Practice

Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Introduction
    - Unit Testing with Junit
        - JUnit Step 1: Why is Unit Testing Important?
        - JUnit Step 2: Setting up your first JUnit
          Step 03: First Successful JUnit. Green Bar and assertEquals
        - Step 04: Refactoring Your First Junit Test
        - Step 05: Second JUnit Example assertTrue and assertFalse
        - Step 06: @Before @After
        - Step 07: @BeforeClass @AfterClass

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Electricity Bill
- Testing using Assertion

Additional Hands-On

Complete the following additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Loan EMI Calculator

Day 38

JUnit

Testing Exceptions, Comparing Arrays, Parameterized Tests, Test Suites.

Learn and Practice

Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Unit Testing with Junit
        - Step 08 : Comparing Arrays in Junit Tests
        - Step 09 : Testing Exceptions in Junit Tests
        - Step 10 : Testing Performance in Junit Tests
        - Step 11 : Parameterized Tests
        - Step 12 : Organize JUnits into Suites

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Product Login Test Suite
- Parameterized

Mockito

Learn and Practice

Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Getting Ready for Mockito
- Need For Mockito
- Mockito Basics

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Verify Call - JUnit using Mockito
- TestMockDB

Additional Hands-On

Complete the following additional hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Test Callback

Day 39

Test Driven Development

Test Automation, Test Code Optimization and Test Driven Development

Learn and Practice

 Learn TDD in 24 Hours

- Go through the below mentioned sections and implement examples along with the author of this course.
    - Getting started with automated tests.
    - Taking care of the test code
    - Test-Driven Development

Code Quality

The concepts include importance of code quality and coding standards.

Master class

- To be driven by SME.

Learn and Practice

- Refer this document.

Hands-On

Complete the following hands-on given in the Learning Path at Tekstac.

 Do not copy paste the code. Write the code yourself.

- Hands On - LMS Refactoring

Additional Learning

- Please go thru the links on **PMD, Checkstyle, FindBugs, SONAR** in the platform

Code Challenges (For Practice Only)

Attempt the following Code Challenges through the Learning Path for checking your skill level on user TDD and Code Quality. There will be only 3 attempts and you have to score 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge - TDD, Junits
- Code Challenge - Code Quality

Stage 2: Milestone 3 - Logging and Code Quality

About Lombok

Lombok is a Java Library that allows us to reduce boilerplate code. Project Lombok does this via annotation.

What is Lombok and why we use it? - Click Here

Differences between Lombok , Immutables and AutoValue - Click Here

Day 40, 41

Lombok, SONAR

Note: Download and go through the learning objectives of Lombok, SONAR from the Learning Path.

Learning Reference

- Logging Session

Learn and Practice

Maven Crash Course.

- JaCoCo Code Coverage and Sonar

Hands On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Flight Management
- Patient Intake System
- Trainee Manager

Reference Links

- http://www.javabyexamples.com/lombok-log4j-slf4j-and-other-log-annotations
- https://projectlombok.org/
- https://www.sonarqube.org/
- https://dzone.com/articles/how-quickly-get-started-sonar

Evaluate Yourself!!!

Now, it's time to **Refer… Relate… Relish**

You have just finished the learning of Spring Core, Maven, TDD and Code Quality. How about applying your knowledge in certain **real-time scenarios???**

Learn What, Why and How aspects of the core topics from the above skills.

Here is the link. **PLEASE Go through and keep yourself always updated!!**

Stage 3: Milestone 1 - Application debugging - Backend

Day 42

GIT

About GIT

Git is mature and Open source Version control system that allows us to manage the changes to source code over time. Jenkins will use the Git as version control system to create CI/CD Pipeline.

What is GIT and why we use it? - Click Here

Differences between Github and GitLab - Click Here

This module deals with basics of GIT and its basic implementation.

Note: Download and go through the learning objectives of **GIT** from the Learning Path.

Learn and Practice

Git Complete: The definitive, step-by-step guide to Git

- Section 1: Introduction
  - Why Source Control?
  - Why Git?
  - Key Git Terminology
- Section 5: Basic Git Commands
  - Basic Commands Overview
  - Starting with a Fresh Project (git init)
  - Adding Git to an Existing Project (gitinit)"
  - Starting on GitHub by Joining an Existing Project (git clone)
  - Basic Git Workflow (add, commit, pull & push)
  - Ignoring Unwanted Files and Folders
- Section 8: Branching and Merging
  - Branching Basics
  - Happy Path / Fast Forward Merges
  - Automatic Merges
  - Conflicting Merges and Resolution
  - Cleanup and Push back to GitHub

Day 43

Application Debugging

- Go through the video and download the code from the Tekstac platform. Debug the application as per the video in the Milestone and do the hands-on

Demo Video

1. Eclipse_Debugging.mp4 - Basic application debugging concepts using eclipse

Additional Learning

Eclipse Debugging Techniques And Tricks

- Go through the entire course.

Day 44, 45

Database, Business layer, Unit testing

- These days will be spent on the following IDP development activities.
  - Implement Business Layer
  - Implement Data Access Layer
  - Writing Unit Test cases

Day 46

Internal Demo and Rework

- This day can be utilized for Internal Demo & Re-work

Stage 3: Milestone 2 - Spring Data JPA with Spring Boot

About Spring Data JPA

What & Why?

Spring Data JPA, part of the larger Spring Data family, makes it easy to easily implement JPA based repositories. This module deals with enhanced support for JPA based data access layers. It makes it easier to build Spring-powered applications that use data access technologies.

Implementing a data access layer of an application has been cumbersome for quite a while. Too much boilerplate code has to be written to execute simple queries as well as perform pagination, and auditing. Spring Data JPA aims to significantly improve the implementation of data access layers by reducing the effort to the amount that's actually needed. As a developer you write your repository interfaces, including custom finder methods, and Spring will provide the implementation automatically.

Features

- Sophisticated support to build repositories based on Spring and JPA
- Support for **Querydsl** predicates and thus type-safe JPA queries
- Transparent auditing of domain class
- Pagination support, dynamic query execution, ability to integrate custom data access code
- Validation of @**Query** annotated queries at bootstrap time
- Support for XML based entity mapping
- JavaConfig based repository configuration by introducing @**EnableJpaRepositories**.

Differences between Hibernate and Spring Data JPA - Click Here

Note: Download and go through the learning objectives of **Spring Data JPA** from the Learning Path.

Day 47

Learn and Practice

Master Hibernate and JPA with Spring Boot in 100 Steps

- Go through the below mentioned sections
  - Section 5: JPA and Hibernate in Depth

Hands-On

Complete the following hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Flat Buyer

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Spring Data JPA**.

Day 48, 49

Spring Data JPA

Learn and Practice

Master Hibernate and JPA with Spring Boot in 100 Steps

- Go through the below mentioned sections
  - Section 6: Establishing Relationships with JPA and Hibernate – OneToOne
  - Section 8: Establishing Relationships with JPA and Hibernate - OneToMany and ManyToMany
  - Section 10: Queries with Entities using JPQL
  - Section 11: Queries using Java API - Criteria Queries
  - Section 13: Spring Data JPA & Spring Data REST

Learning Reference: Code Demo

- Spring Data JPA Code Demo

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Spring Data JPA**.

Code Challenges (For Practice Only)

Attempt the following Code Challenges through the Learning Path for checking your skill level on user Spring Data JPA. There will be only 3 attempts and you have to score 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge :Spring Data JPA with Spring Boot

Stage 3: Milestone 3 - Spring REST using Spring Boot

About Spring REST

What is REST?

The REST stands for **REpresentational State Transfer**.

Let's understand the meaning of each word in the REST acronym.

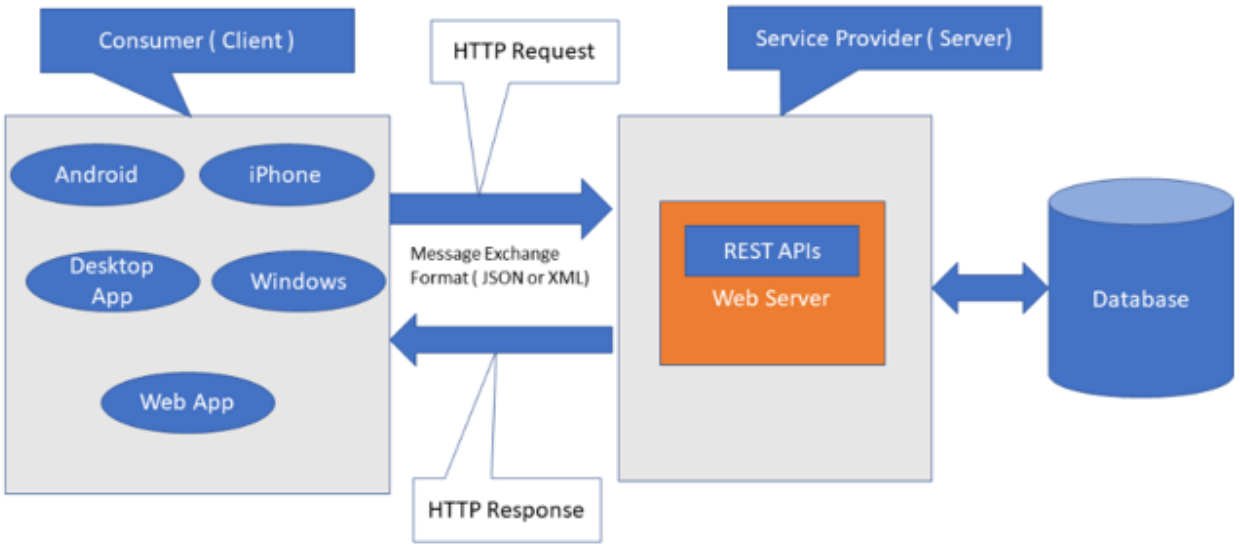
- **State** means data
- **REpresentational** means formats (such as XML, JSON, YAML, HTML, etc)
- **Transfer** means carrying data between consumer and provider using the HTTP protocol

REpresentational State Transfer

- REST was originally coined by **Roy Fielding**, who was also the inventor of the HTTP protocol.
- A **REST API** is an intermediary Application Programming Interface that enables two applications to communicate with each other over HTTP, much like how servers communicate to browsers.
- The REST architectural style has quickly become very popular over the world for designing and architecting applications that can communicate.
- The need for REST APIs increased a lot with the drastic increase of mobile devices. It became logical to build REST APIs and let the web and mobile clients consume the API instead of developing separate applications.

REST Architecture

The below diagram shows the typical REST architecture:



Differences between RESTful Web Service and SOAP Web Service- Click Here

Note: Download and go through the learning objectives of **Spring REST using Spring Boot** from the Learning Path.

Day 50

Spring REST

Learn and Practice

Master Java Web Services and RESTful API with Spring Boot

- Section 2 : Introduction to WebServices
- Section 6: RESTful Web Services with Spring and Spring Boot
  - 51. RESTful Web Services - An Overview
  - 52. Step 01 - Initializing a RESTful Services Project with Spring Boot
  - 53. Step 02 - Understanding the RESTful Services we would create in this course
  - 54. Step 03 - Creating a Hello World Service
  - 55. Step 04 - Enhancing the Hello World Service to return a Bean
  - 56. Step 05 - Quick Review of Spring Boot Auto Configuration and Dispatcher Servlet
  - 57. Step 06 - Enhancing the Hello World Service with a Path Variable
  - 58. Step 07 - Creating User Bean and User Service
  - 59. Step 08 - Implementing GET Methods for User Resource

Expert Session Recordings

We believe that the following recorded sessions will be a valuable resource for you and will help you to achieve your learning goals. We encourage you to take the time to watch each session and to apply the concepts you learn to your work. We are confident that you will find these sessions to be informative, engaging, and beneficial.

- Spring REST Session 1
- Spring REST Session 2

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Employee REST Service

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Spring REST using Spring Boot**.

Day 51

Spring REST

Learn and Practice

Master Java Web Services and RESTful API with Spring Boot

- Section 6: RESTful Web Services with Spring and Spring Boot
  - 60. Step 09 - Implementing POST Method to create User Resource
  - 61. CODE BACKUP FILE : For Reference
  - 62. Step 10 - Enhancing POST Method to return correct HTTP Status Code and Location

Expert Session Recordings

We believe that the following recorded sessions will be a valuable resource for you and will help you to achieve your learning goals. We encourage you to take the time to watch each session and to apply the concepts you learn to your work. We are confident that you will find these sessions to be informative, engaging, and beneficial.

- Spring REST Session 3
- Spring REST Session 4

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Service Provider System - Get and Post
- Service Provider System - Put and Delete

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Spring REST using Spring Boot**.

Day 52, 53

Spring REST

Learn and Practice

Master Java Web Services and RESTful API with Spring Boot

- Section 6: RESTful Web Services with Spring and Spring Boot
  - 63. Step 11 - Implementing Exception Handling - 404 Resource Not Found
  - 64. Step 12 - Implementing Generic Exception Handling for all Resources
  - 65. Step 13 - Exercise : User Post Resource and Exception Handling
  - 66. Step 14 - Implementing DELETE Method to delete a User Resource
  - 67. COURSE UPDATE : Add dependency spring-boot-starter-validation
  - 68. Step 15 - Implementing Validations for RESTful Services
  - 69. COURSE UPDATE : HATEOAS Updates
  - 70. Step 16 - Implementing HATEOAS for RESTful Services

Expert Session Recordings

We believe that the following recorded sessions will be a valuable resource for you and will help you to achieve your learning goals. We encourage you to take the time to watch each session and to apply the concepts you learn to your work. We are confident that you will find these sessions to be informative, engaging, and beneficial.

- Spring REST Session 5
- Spring REST Session 6
- Spring REST Session 7
- Spring REST Session 8

Hands-On

Complete the following hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Course Management - Exception Handling

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Spring REST using Spring Boot**.

Code Challenge (For Practice Only)

Attempt the following Code Challenge through the Learning Path at Tekstac for checking your skill level on Spring REST using Spring Boot. You have to secure 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge: Spring REST using Spring Boot

IDP - Project Activities

Day 54, 55

Spring REST and Spring Data JPA

- These days will be spent on the following IDP development activity.
    - Implement Spring REST Webservices and Spring Data JPA database components

Day 56

Internal Demo and Rework

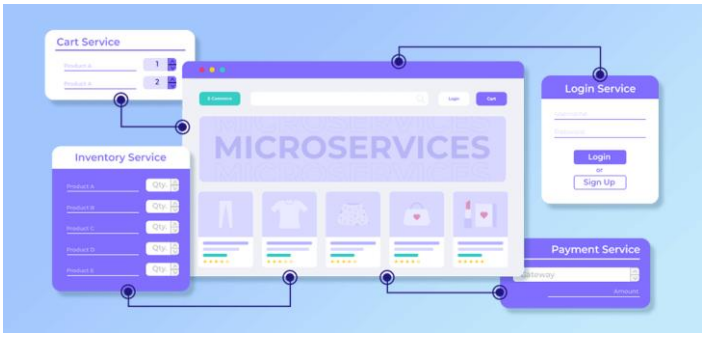
- This day can be utilized for Internal Demo & Re-work

Stage 3: Milestone 4 - Microservices

About Microservices

What are Microservices?

While building an application, one has to keep many factors in mind to make the application efficient and effective. Several services are performed while building an application. So, what are microservices? Microservice is one such service that is responsible for software development. It helps you to identify future debugging problems and allows you to check architecture for service and performance.



Also, the major advantage we have using microservice is that even if one component fails, the entire software system will not break. Since microservice divides the app into sub-components. Using a common toolset for microservice in DevOps, both the development and operations can be handled smoothly. In this article, each and every detail about microservice is explained such as microservice – characteristics, architecture, examples, etc.

Reasons for Using Microservice

In monolithic applications, there are a few challenges:

- For a large application, it is difficult to understand the complexity and make code changes fast and correctly, sometimes it becomes hard to manage the code.
- Applications need extensive manual testing to ensure the impact of changes.
- An application typically shares a common relational database to support the whole application.
- For small changes, the whole application needs to be built and deployed.
- The heavy application slows down start-up time.

Benefits of Microservices

1. **Small Modules –** The application is broken into smaller modules that are easy for developers to code and maintain.
2. **Easier Process Adaption –** By using microservices, new Technology & Process Adaption becomes easier. You can try new technologies with the newer microservices that we use.
3. **Independent scaling –** Each microservice can scale independently via X-axis scaling (cloning with more CPU or memory) and Z-axis scaling (sharding), and Y-axis scaling (functional decomposition) based on their needs.
4. **Removes dependency –** Microservice eliminates long-term commitment to any single technology stack.
5. **Unaffected –** Large applications remain largely unaffected by the failure of a single module.
6. **DURS –** Each service can be independently DURS (deployed, updated, replaced, and scaled).
7. **Increased Security: –**Microservices enable data separation. Each service has its own database, making it harder for hackers to compromise your application.

8. **Open Standards: –**APIs enable developers to build their microservices using the programming language and technology they prefer.

Components of Microservice Architecture

Microservices were introduced to update the requirement in the application (components) without affecting the entire application. Microservice architecture is a type of application architecture where the application is developed as a collection of services. It helps in providing a framework used to develop, deploy, and maintain microservices architecture diagrams and services independently. Each service can be changed according to the need of the application without affecting the rest of the application.

The components of microservice architecture include:

- **Identity Providers –** This service allows users to access and identify data. It creates applications using a collection of loosely coupled services. You can redirect users to the IAM for authentication, i.e., set up a user database and define permissions for user-facing microservices.
- **Databases –** It owns a private database to access data and it is also updated through its service API. It supports inter-process communication for a different technology to any remote service.
- **Containers –** These are software packages that operate independently to avoid any disturbance in the other components. Containers are efficient since they rely on specific dependencies and the underlying code. Also, container orchestration tools like Kubernetes provide automated scaling and container management.
- **Service Discovery –** It manages deployment and distributes the load evenly, it features a service consumes, service registry, and service provider.
- **API Gateway –** It serves as an essential part of communication in the system between the client and microservices.

Note: Download and go through the learning objectives of **Microservices** from the Learning Path.

Day 57, 58, 59

Microservices

Learn and Practice

Microservices: Designing Highly Scalable Systems

- All Sections in this course

Expert Session Recordings

We believe that the following recorded sessions will be a valuable resource for you and will help you to achieve your learning goals. We encourage you to take the time to watch each session and to apply the concepts you learn to your work. We are confident that you will find these sessions to be informative, engaging, and beneficial.

- Microservice Session 1
- Microservice Session 2
- Microservice Session 3

Hands-On

Complete the following hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Register App in Spring Cloud
- Access App Via Router -V1

Code Challenge (For Practice Only)

Attempt the following Code Challenge through the Learning Path at Tekstac for checking your skill level on Microservices. You have to secure 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge: Microservices

IDP - Project Activities

Day 60

Microservices Implementation

- These days will be spent on the following IDP development activity.
    - Implement Microservices using Spring Cloud

Interim Evaluation

Day 61

Interim Evaluation (Project + Technical)

- Interim evaluation will be conducted on this day, and the mode will be a video interview on the Tekstac platform.

Stage 4: Milestone 1 - Docker

About Microservices

Docker overview

Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. With Docker, you can manage your infrastructure in the same ways you manage your applications. By taking advantage of Docker's methodologies for shipping, testing, and deploying code quickly, you can significantly reduce the delay between writing code and running it in production.

The Docker platform

Docker provides the ability to package and run an application in a loosely isolated environment called a container. The isolation and security allows you to run many containers simultaneously on a given host. Containers are lightweight and contain everything needed to run the application, so you do not need to rely on what is currently installed on the host. You can easily share containers while you work, and be sure that everyone you share with gets the same container that works in the same way.

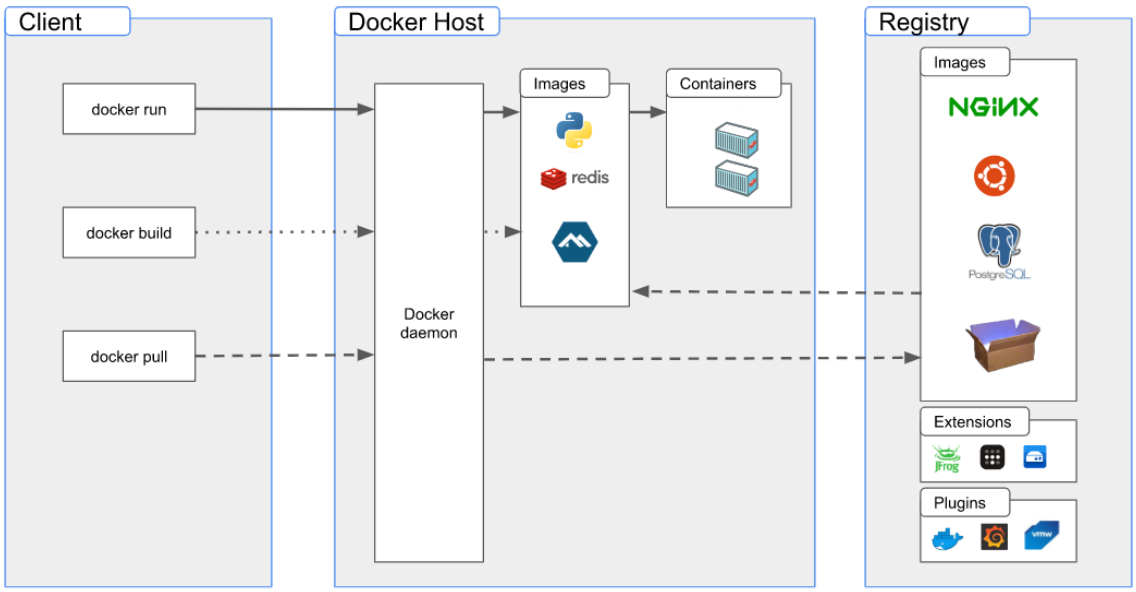
Docker provides tooling and a platform to manage the lifecycle of your containers:

- Develop your application and its supporting components using containers.
- The container becomes the unit for distributing and testing your application.
- When you're ready, deploy your application into your production environment, as a container or an orchestrated service. This works the same whether your production environment is a local data center, a cloud provider, or a hybrid of the two.

Docker architecture

Docker uses a client-server architecture. The Docker *client* talks to the Docker *daemon*, which does the heavy lifting of building, running, and distributing your Docker containers. The Docker

client and daemon *can* run on the same system, or you can connect a Docker client to a remote Docker daemon. The Docker client and daemon communicate using a REST API, over UNIX sockets or a network interface. Another Docker client is Docker Compose, which lets you work with applications consisting of a set of containers.



Note: Download and go through the learning objectives of **Docker** from the Learning Path.

Day 62

Expert Session Recordings

We believe that the following recorded sessions will be a valuable resource for you and will help you to achieve your learning goals. We encourage you to take the time to watch each session and to apply the concepts you learn to your work. We are confident that you will find these sessions to be informative, engaging, and beneficial.

- Docker Session 1
- Docker Session 2

Note: Trainer to show the demo of the given objectives

This module deals with various topics on Angular/React.

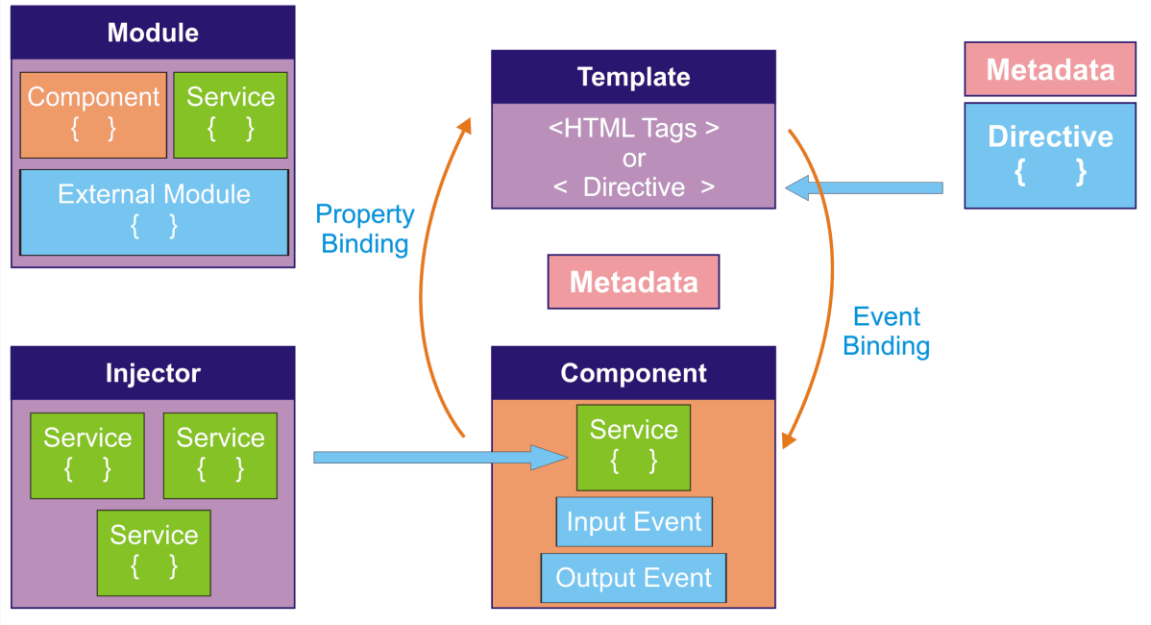
	Based on your track, use the appropriate learning content of Angular OR React on the LP.

Note: Download and go through the learning objectives of **Angular/React** from the Learning Path.

Do You Know?

Angular

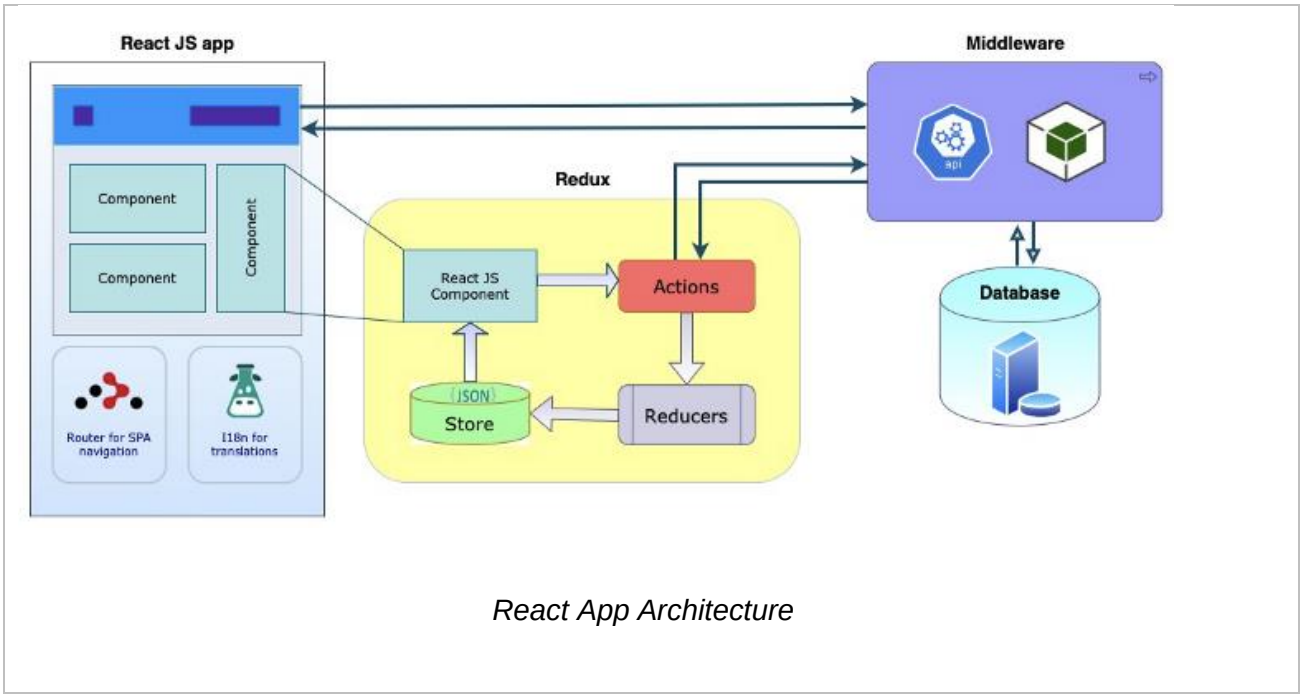
Angular is a TypeScript-based free and open-source web application framework led by the Angular Team at Google and by a community of individuals and corporations. Angular is a complete rewrite from the same team that built AngularJS.



Angular Architecture

React

React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies.



React App Architecture

Day 63, 64

Angular

Learn and Practice

Angular – The complete guide

- Learn the sections listed below in this Udemy course
  - Section 1: Getting started
- Implement the examples along with the author.

React

Learn and Practice

React - The Complete Guide (incl Hooks, React Router, Redux)

- Learn the sections listed below in this Udemy course
  - Section 1: Getting Started
  - Section 2: JavaScript Refresher
  - Section 3: React Basics & Working With Components
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Stock securities-Component
- Display Current Date and Time
- Share market-statistics
- One Spot Furniture -component
- Telecom-statistics

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **React**.

Day 65

Angular

Learn and Practice

Angular – The complete guide

- Learn the sections listed below in this Udemy course
  - Section 2: The basics
  - Section 17: Using Pipes to Transform Output
  - Section 28: A Basic Introduction to Unit Testing in Angular Apps
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- My First - Sports Club App
- Boat Ride Entrance Fee

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Angular**.

React

Learn and Practice

React - The Complete Guide (incl Hooks, React Router, Redux)

- Learn the sections listed below in this Udemy course
  - Section 4: React State & Working with Events
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Apple Inc. Market - state
- Create Information Dashboard - With State And Props
- Stock Securities-Props
- Stock Securities-double and array props
- FunTimeTicket - PropTypes
- Quote For the Day – Event

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **React**.

Day 66

Angular

Learn and Practice

Angular – The complete guide

- Learn the sections listed below in this Udemy course
    - Section 11: Changing pages with Routing
    - Section 15: Handling Forms in Angular Apps
    - Section 28: A Basic Introduction to Unit Testing in Angular Apps
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Rent A Home - Routing with Query param

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Angular**.

React

Learn and Practice

React - The Complete Guide (incl Hooks, React Router, Redux)

- Learn the sections listed below in this Udemy course
  - Section 5: Rendering List & Conditional Content
  - Section 20: Building a Multi-Page SPA with React Router
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Tech Valley- Styles
- Stock Securities -Report- keys and styles-Final
- Style table using External CSS –Final
- Router- Final

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **React**.

Day 67, 68

Angular

Learn and Practice

Angular – The complete guide

- Learn the sections listed below in this Udemy course
  - Section 15: Handling Forms in Angular Apps
- Implement the examples along with the author.

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Angular**.

React

Learn and Practice

React - The Complete Guide (incl Hooks, React Router, Redux)

- Learn the sections listed below in this Udemy course
  - Section 16: Working with Forms & User Input
  - Section 14: Sending Http Requests (e.g. Connecting to a Database)

- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Course Details with Form_Final
- Student Details using Map_Final
- Sort Applicants List_Final
- Search for Course availability

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **React**.

Day 69, 70

Angular

Continuous Learning: Technical Enablement

Angular – The complete guide

- Learn the sections listed below in this Udemy course
  - Section 5: Components & Databinding Deep Dive
  - Section 18: Making Http Requests
  - Section 20: Authentication & Route Protection in Angular
  - Section 23: Deploying an Angular App
  - Section 28: A Basic Introduction to Unit Testing in Angular Apps
- Implement the examples along with the author.

Hands-On

Complete the following set of hands-on given in the Learning Path at Tekstac.

Do not copy paste the code. Write the code yourself.

- Book House - Cross component communication

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **Angular**.

Code Challenge (For Practice Only)

Attempt the following Code Challenge through the Learning Path at Tekstac for checking your skill level on Angular. You have to secure 70% in order to clear this challenge.

Do not copy paste the code. Write the code yourself.

- Code Challenge: Angular

React

Offline Hands-On (Additional Practice)

- Try out the offline hands-on exercises given in the learning path on **React**.

Code Challenge (For Practice Only)

Attempt the following Code Challenge through the Learning Path at Tekstac for checking your skill level on React. You have to secure 70% in order to clear this challenge.

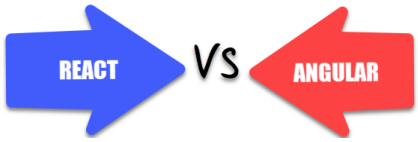
Do not copy paste the code. Write the code yourself.

- Code Challenge: React

Refer the Coding Standards to check if you've followed it or not!!!

Additional Learning Resource

Difference between React and Angular



Parameters	React	Angular
Type	React is a JavaScript library, and it is much older compared with Angular.	Angular is a complete framework.
Use of libraries	React js can be packaged with other programming libraries.	Angular is a complete solution in itself.
Learning curve	It is easier to grasp compared Angular. However, it is difficult to learn when augmented with Redux.	Learning Angular is not easy for beginners. Thus, it requires lots of training.
Community support	When it comes to community support React doesn't offer much.	It has a viable and dependable community support system

Installation time	React takes longer to set up. But, it is really fast for delivering projects and building apps.	Angular is easy to set up but may lead to an increase in coding time which also results in delayed project deliveries.
Best feature	It gives you the freedom to choose the tools, architecture, and libraries, for developing an app.	It offers a limited amount of freedom and flexibility.
Data binding	React language uses one-way data binding, which means that the Ul elements can't be changed without updating the corresponding model state.	Angular, on the other hand, uses the two-way data binding method. It helps you to ensure that the model state automatically changes when any change is made.
Testing & Debugging	It requires a set of tools to perform different types of testing.	The testing and debugging for a complete project is possible with a single tool.
Documentation	Although it is also undergoing regular updates, the documentation is relatively faster.	Due to the ongoing development process, the documentation is slower.
Updates	Updates in React are simple because scripts help in the migration.	It plans updates every six months, which gives some time to make needed changes for migration.
Application Types	Use this app if you want to develop Native apps, hybrid apps, or web apps	You should use this framework If you want to develop a SPA (Single Page Application) and mobile apps.
Ideal for	Ideal for modern web development and native- rendered apps for Android and iOS devices.	Ideal to use when you want to develop large-scale, feature-rich applications.
Model	It is based on Virtual DOM	Based on MVC (Model View Controller)
Written in	JavaScript	Typescript
Community Support	Facebook developers community	A large community of developers and supporters
Language preference	JSX – JavaScript XML	TypeScript
Companies Using	Facebook, Uber Technologies, Instagram, Netflix, Pinterest, etc.	Wepay, Beam, Auto Trader, Mesh, Streamline Social, etc.
Template	JSX + J% (ES5/ES6)	HTML + TypeScript

Abstraction	Strong	Medium
Adding Javascript library to the source code	Possible	Not possible
Restriction	React gives you an option to choose without putting any performance penalty.	An angular framework is very sensitive, which means that it restricts you from using large models.
Use of code	React allows you to manage the code according to your desired format.	Angular comes with many ready to use elements. However, it mainly comes from a specific provider.

Stage 4: Milestone 3 - Application debugging - Frontend

Day 71

Application Debugging - Spring REST API

- Go through the videos on debugging REST API for logical coding errors and Debugging a REST API using log files.

Application Debugging - Front end debugging

- Go through the videos on Angular/React debugging.

IDP - Project Activities

Day 72, 73

Angular/React Implementation

These days will be spent on the following IDP activity.

- Implement the front end using Angular/React

IDP - Project Activities

Day 74, 75

Integration

These days will be spent on the following IDP activity with the Trainer guidance.

- Integration of Front-end with Web API

Final Evaluation

Day 76, 77, 78

Final Evaluation (Project + Technical)

- Final Evaluation will be conducted on these days, and the mode will be a video interview on the Tekstac platform.

Final Assessment

Day 79, 80

Final Assessment

- **Prep & Assessment**

There will be a Final Assessment to evaluate on the key skills of the FSE curriculum.

How to learn each day?

Each day has a set of learning objectives. These learning objectives can be met by going through the Udemy courses and by completing the hands on exercises mentioned in the daily plan.

The below strategies will help you decide the learning approach.

Find below few imaginary profiles. For each of these profiles we have defined a recommended learning approach. This is not an exhaustive list. The approaches below might help invent a new way of learning.

Profile #1

Harry Reacher

Engineering Discipline: Electronics

Skills: Python, Ruby on Rails, nginx

Project: Mining Crime Data to get Route Cause Insights

Learning Approach to Programming Languages: I do not want to waste my time learning. I am more practice oriented. I want to work on the problem immediately

What will work for me?

- Directly complete hands on exercises
- Refer Internet or Udemy Courses
- If hands on are implemented early, clarify your friends questions and troubleshoot their issues

Profile #2

Olivia Richards

Engineering Discipline: Computer Science

Skills: Java, C, C++

Project: Library Management System

Learning Approach to Programming Languages: I have interest, but I don't know where to start.

What will work for me?

- Go through the recommended Udemy Course
- Try completing the hands on exercises
- Get your clarifications solved with help from Tech SME
- Get help from other learners in your batch whom had already completed

Profile #3

Greg Anderson

Engineering Discipline: Civil

Skills: C

Project: Fiber reinforced concrete

Learning Approach to Programming Languages: I am scared of programming languages. I haven't got my hands dirty with coding

What will work for me?

- Go through the recommended Udemy Course
- Implement the coding along with the author of the Udemy Course
- Try completing the hands on exercises
- Clarify queries with SME
- Troubleshoot programming issues with help from SME or learner from your classroom whom had already completed

FAQs

1. Who can participate in this program?

Students who have enrolled for Full Internship Program (or) the Cognizant on-boarded GEN Cs can participate in this program.

2. Is there any pre-learning I should do?

No. This program is open to all students from any academic discipline.

3. What is Code Challenge?

A problem statement will be provided to you and you need to solve it using a single skill.

4. What is Integrated Capability Test (ICT)?

A case study problem statement will be provided to you, that you may need solve using the combination of Skills learnt in the given stage.

5. How many attempts are provided for the Coding challenge and ICTs? Is it open all the time for practice?

The Coding challenges and ICTs are open and there are 3 attempts to take them up.

6. What are the entry criteria for qualifier?

A 100% hands-on completion and attempt in CC & ICT are the eligibility criteria for qualification.

7. What skills are covered in the qualifier?

The skills of Stage 1 are covered in the qualifier. Only ONE attempt is provided to clear with a minimum score of 70%

8. What if I fail in the Interim evaluation?

Your coach will notify your performance in the Interim evaluation. However, you can continue with the learning.

9. How many chances will I get in the Final evaluation?

You'll get 2 chances in the Final evaluation which covers ALL the skills in the learning journey.

10. Will we be provided with Projects to work on?

No, you will have to ideate, design and develop the project which will be reviewed and assessed by the project mentor.

11. Whom do I reach out in case of any queries?

Coach is your point of contact.