

**INDUSTRIAL TRAINING PROJECT REPORT**

**Loan Processing System**

**(Internship at FICO)**

*A practical training report in partial fulfilment of the requirements for the  
Degree of*

**B. Tech in Computer Science and Engineering**

by

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2021-22**

**JUNE 2021 to AUGUST 2021**



## CERTIFICATE

I am currently pursuing my 1-year internship at FICO. Internship certificate will be awarded after successful completion of my Internship Tenure. Some other certifications completed to increase domain knowledge for the project are attached below.





## **ABSTRACT**

The aim of this Internship is to learn about the corporate world standards and use these as tools for the advancement of technologies and products.

This 1-year internship programme started in June 2021, where the first three months were majorly focused on learning and implementing new skills and technologies in order to provide a productive mini product.

The role of Software Engineer aims to develop and update FICO products and applications.

The training started with several courses and new technologies, which was structured in manner to develop a unique Loan Processing Application as the practical implementation of the learn skills.

The goal of developing the Loan Processing Application was not only to implement the theoretical knowledge into a working project but also to learn development in teams and the need for the agile methodologies.

Loan Processing System is a secured dynamic web application to apply for loan via virtual medium.

# Week-wise Progress Report

## WEEK-1

The first week was primarily focused on improving the loopholes in the core domain knowledge and provide a concrete base for the new tools and technologies.

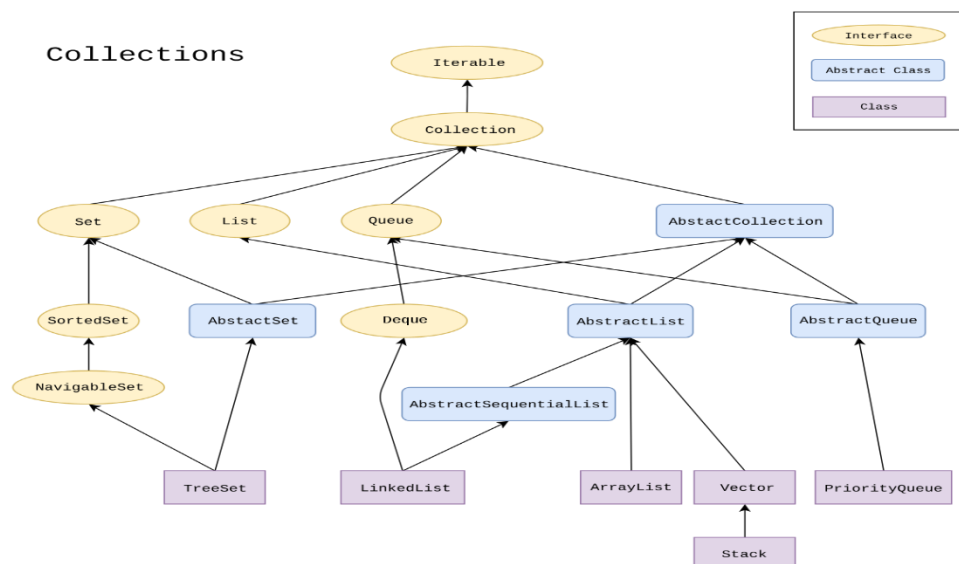
This week was dedicated for core Java concepts specifically multi-threading, File Processing, Java Collections and Java Development Kit. The goal was to improve the knowledge of object-oriented programming to implement the core knowledge into practical applications.

### Multi-threading

Multithreading is Java feature that allows concurrent execution of two or more parts of a program for maximum CPU utilization.

### Java Collections

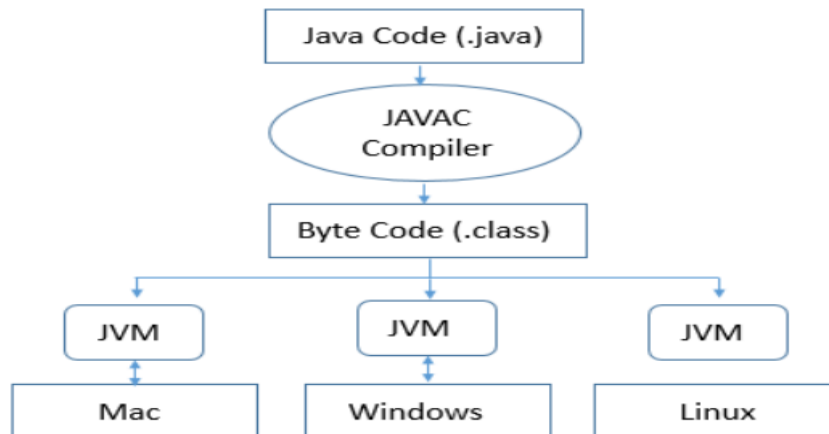
Class Collections. public class Collections extends Object This class consists exclusively of static methods that operate on or return collections. It contains polymorphic algorithms that operate on collections, "wrappers", which return a new collection backed by a specified collection, and a few other odds and ends.



### Java Development Kit

The **Java Development Kit (JDK)** is a software development environment used for developing Java applications and applets. It includes the Java Runtime Environment,

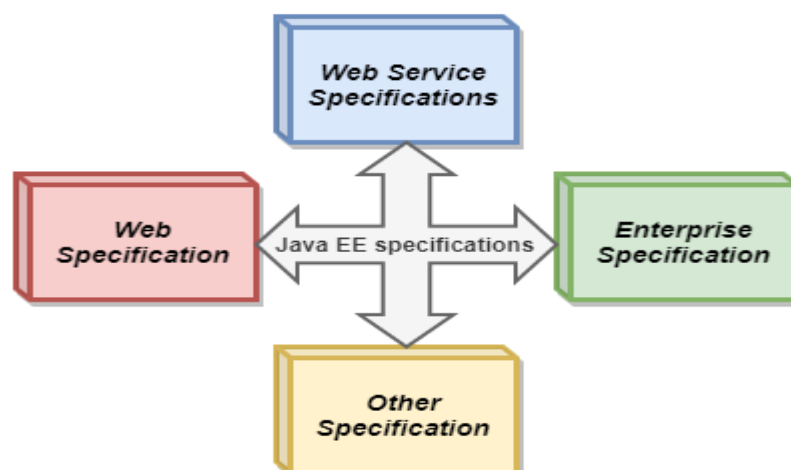
an interpreter/loader, a compiler, an archiver, a documentation generator and other tools needed in Java development.



## WEEK-2

### JAVA Enterprise Edition

Java Enterprise Edition is also known as J2EE/ Java EE/ Jakarta EE. It is a set of specifications wrapping around Java SE (Standard Edition). The Java EE provides a platform for developers with enterprise features such as distributed computing and web services. Java EE applications are usually run-on reference run times such as **micro-servers** or **application servers**.



This week was dedicated for the practical applications of:

Servlet, Web Sockets, Java Server Pages and various Java API's.

## WEEK-3

### Git

Git is a **version control system** that lets you manage and keep track of your source code history. It is also known as Global Information Tracker.

### GitHub

GitHub is a web-based platform used for **version control**. Git simplifies the process of working with other people and makes it easy to collaborate on projects.

### Source Tree

Source Tree is newbie friendly. It features an intuitive graphical interface for repositories bridging the gap between a user and a Git. Utilizing technology, you will quickly master repository. As to mature developers, they will also benefit from using the Source Tree as it allows them to focus on writing code and being more productive.

### Bitbucket

**Bitbucket** is more than just Git code management. **Bitbucket** gives teams one place to plan projects, collaborate on code, test, and deploy.

### Bitbucket Cloud

Bitbucket Cloud is a **Git based code hosting and collaboration tool**, built for teams. Bitbucket's best-in-class Jira and Trello integrations are designed to bring the entire software team together to execute on a project.

### Maven

Apache Maven is a software project management and comprehension tool. Based on the concept of a project object model (POM), Maven can manage a project's build, reporting and documentation from a central piece of information.

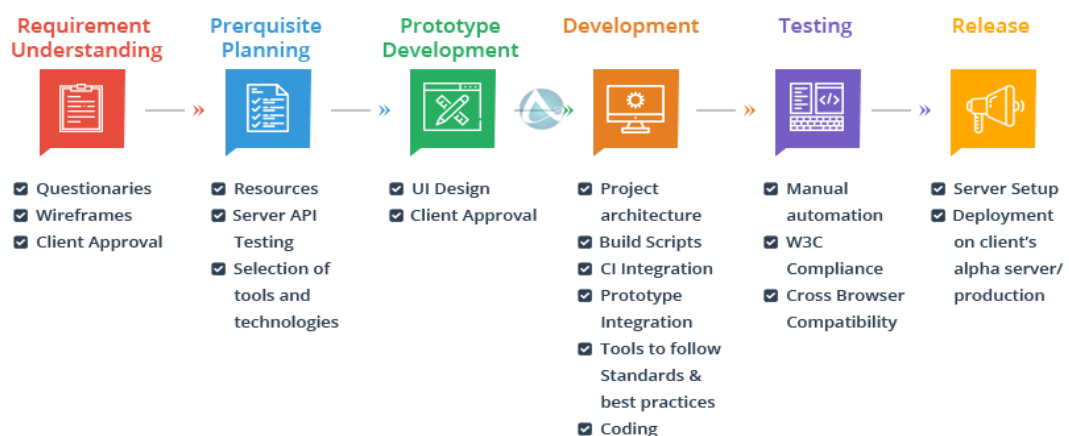
## WEEK-4

### Front-End Development

- **HTML:** The Hyper Text Markup Language, or HTML is the standard markup language for documents designed to be displayed in a web browser. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.



- **CSS: 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. CSS is a cornerstone technology of the World Wide Web, alongside HTML and Java Script.
- **Java Script:** JavaScript is high-level, often just-in-time compiled, and multi-paradigm. It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions. Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. Over 97% of websites use it client-side for web page behaviour, often incorporating third-party libraries. Most web browsers have a dedicated JavaScript engine to execute the code on the user's device.
- **Bootstrap:** Bootstrap is a free front-end framework for faster and easier web development Bootstrap includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels and many other, as well as optional JavaScript plugins Bootstrap also gives you the ability to easily create responsive designs.
- **Thymeleaf: Thymeleaf:** It is a modern server-side Java template engine for both web and standalone environments. Thymeleaf's main goal is to bring elegant *natural templates* to your development workflow — HTML that can be correctly displayed in browsers and work as static prototypes, allowing for stronger collaboration in development teams.
- **Tailwind CSS:** Tailwind CSS is basically a utility-first CSS framework for rapidly building custom user interfaces. It is a highly customizable, low-level CSS framework that gives you all of the building blocks you need to build bespoke designs without any annoying opinionated styles you have to fight to override.



*Front-End Development Cycle*



## WEEK-5

### JSON

JSON (JavaScript Object Notation) is a lightweight data-interchange format. The JSON format is syntactically similar to the code for creating JavaScript objects. Because of this, a JavaScript program can easily convert JSON data into JavaScript objects.

### Selenium

It is an open-source tool that automates web browsers. It provides a single interface that lets you write test scripts in programming languages like Ruby, Java, NodeJS, PHP, Perl, Python, and C#, among others.

### Junit

JUnit is a Java unit testing framework that's one of the best test methods for **regression testing**.

### SQL

SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database or retrieve data from a database.

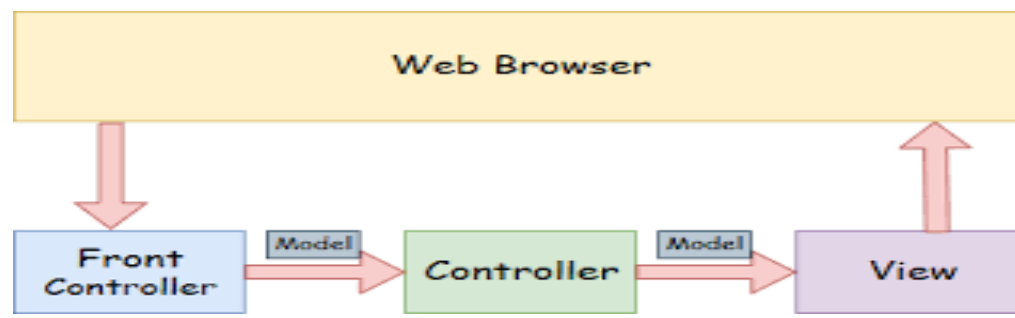
### NoSQL

NoSQL databases (aka "not only SQL") are non-tabular databases and store data differently than relational tables. NoSQL databases come in a variety of types based on their data model. The main types are document, key-value, wide-column, and graph. They provide flexible schemas and scale easily with large amounts of data and high user loads.

## WEEK-6 & 7

### Back-End Technologies

**Spring MVC:** Spring MVC is a library within the Spring framework that simplifies handling HTTP requests and responses. It's built on the Servlet API and is an essential component of the Spring Framework. It follows the Model-View-Controller design pattern. It implements all the basic features of a core spring framework like Inversion of Control, Dependency Injection. It is an open-source, light-weight and cross-platform application framework for easy application development as it takes care of infrastructure and developers need to concentrate on business logic



## Hibernate

Hibernate's primary feature is **mapping from Java classes to database tables**, and mapping from Java data types to SQL data types. Hibernate also provides data query and retrieval facilities. It generates SQL calls and relieves the developer from the manual handling and object conversion of the result set.



## WEEK-8 to 12

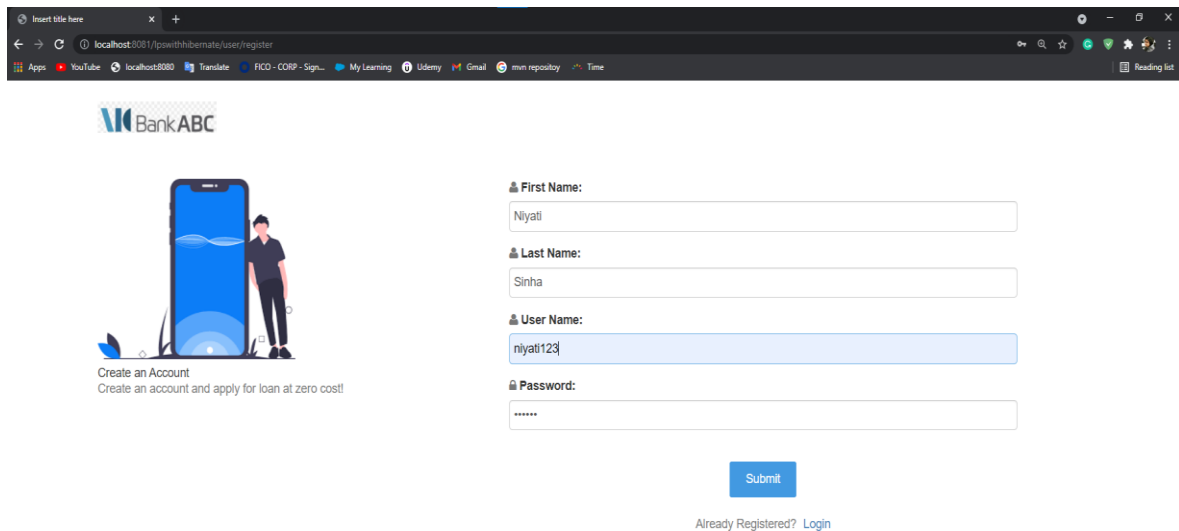
### Dynamic Web Project

Dynamic web projects can **contain dynamic Java EE resources** such as servlets, JSP files, filters, and associated metadata, in addition to static resources such as images and HTML files. Static web projects only contain static resources.

### Loan Processing System

It is a dynamic web project, with the aim to provide a secured Loan Application and client-side management application.

**Registration:** A new user must register before he/she can apply for a loan. The Username acts as the primary key to identify an individual user.



**Bank ABC**

Create an Account  
Create an account and apply for loan at zero cost!

First Name: Niyati

Last Name: Sinha

User Name: niyati123

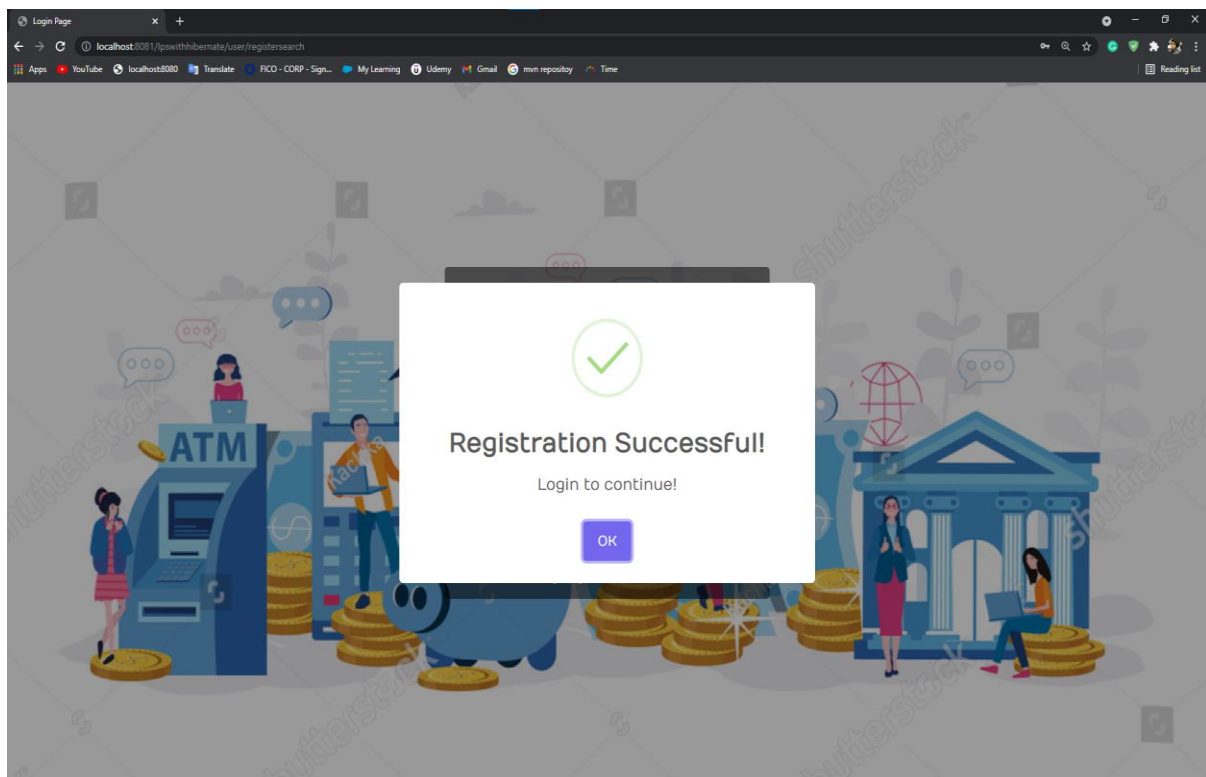
Password: \*\*\*\*\*

[Submit](#)

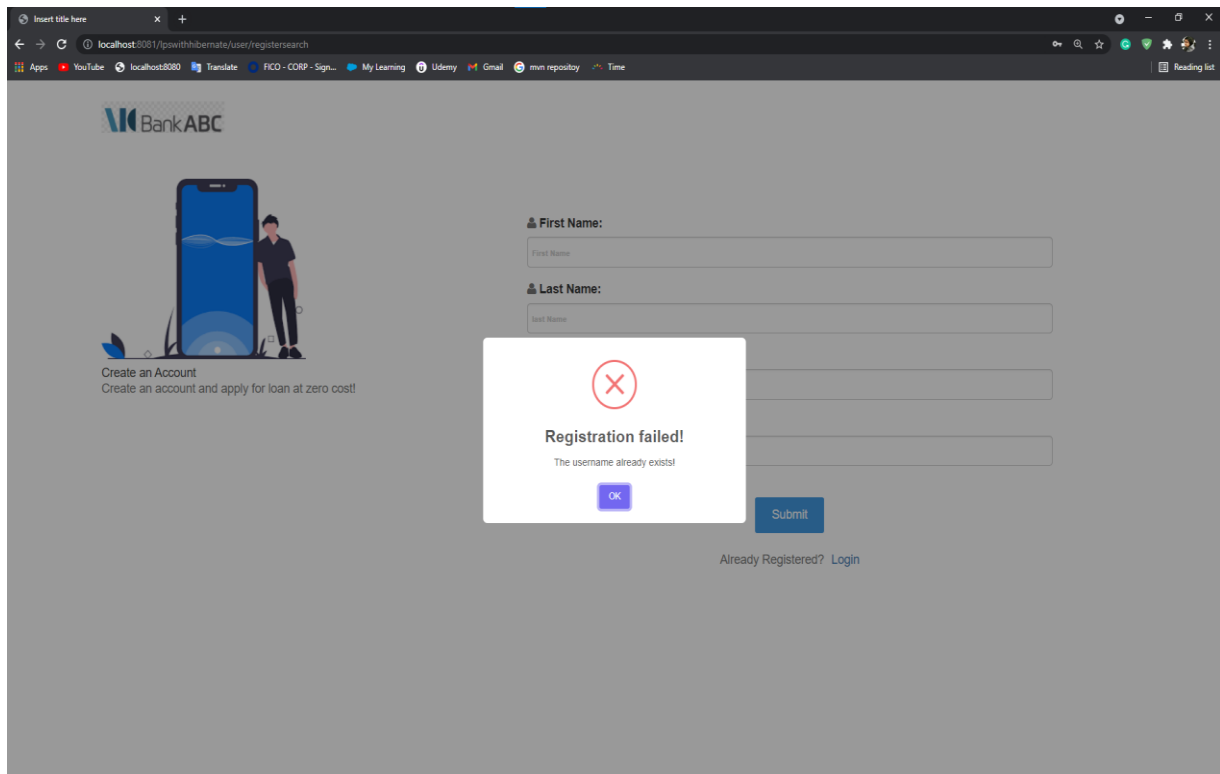
[Already Registered? Login](#)

### *Registration Page*

However, if the user chooses an already existing user then his registration will fail otherwise it will pass and the user will be notified in a pop-up window.

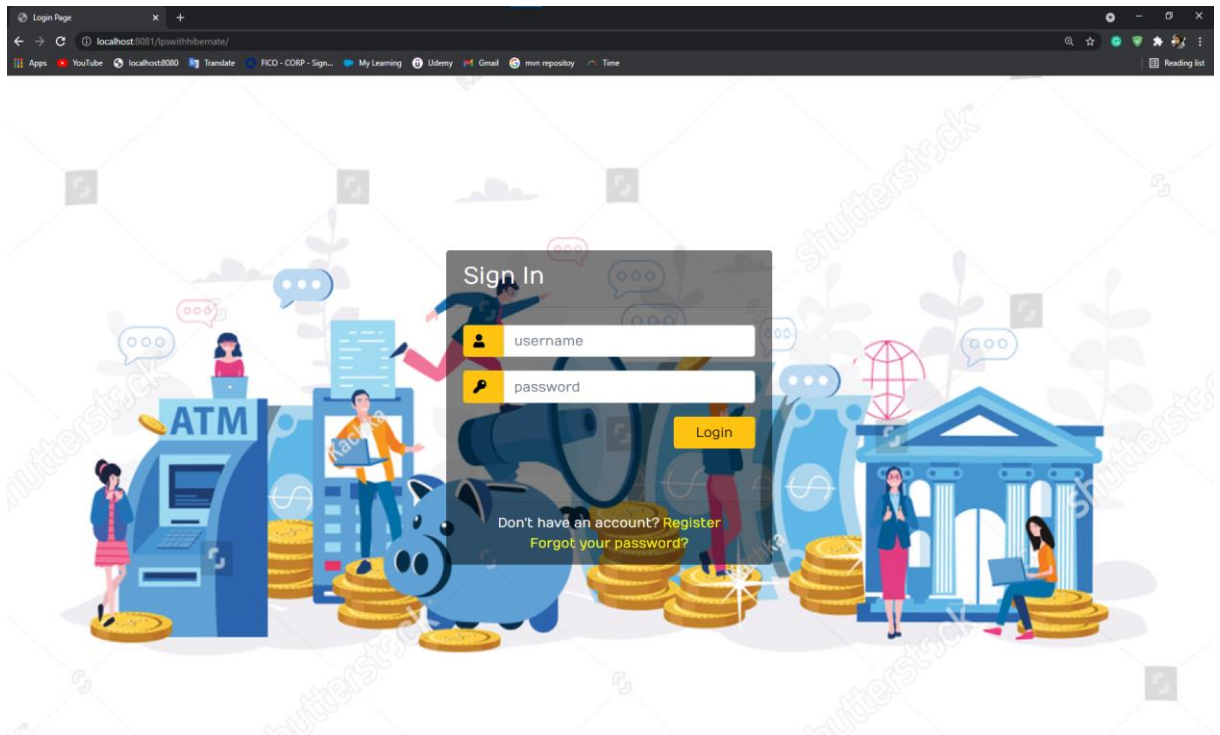


### *Registration Success Pop-Up Window*



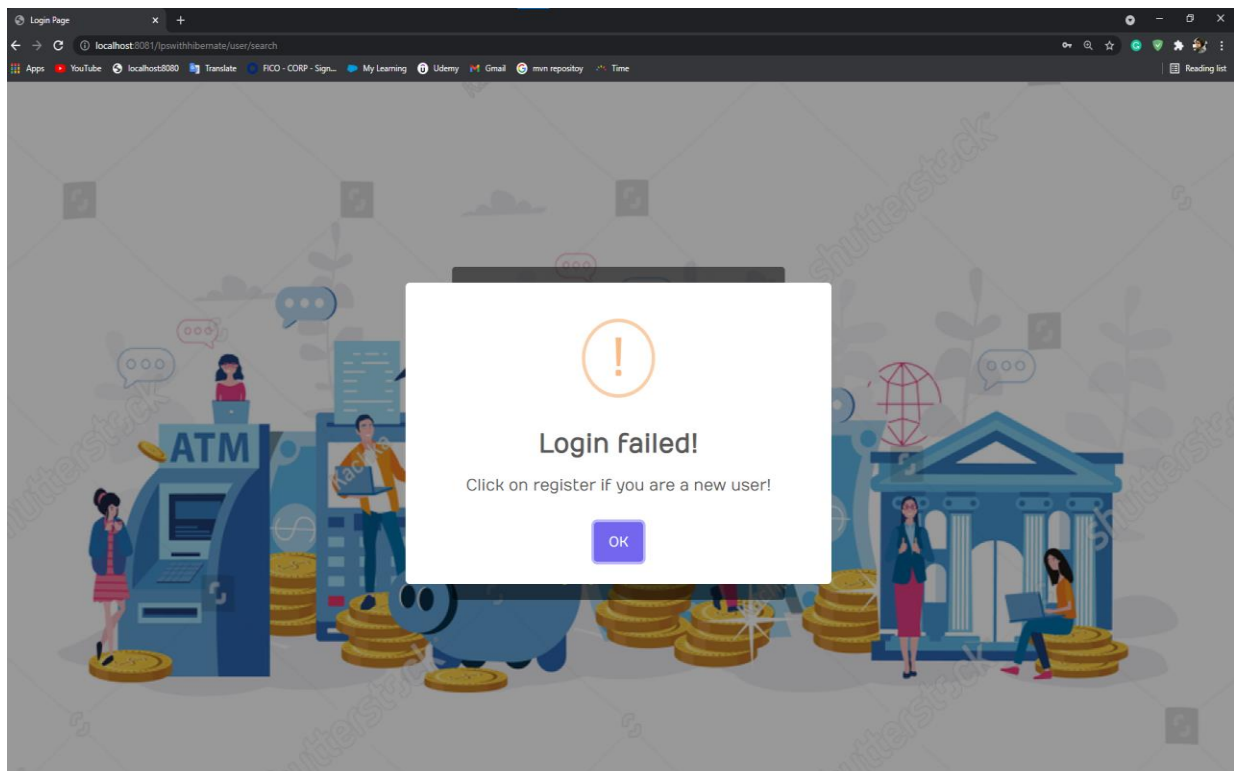
*Registration Failure Pop-Up Window*

**Sign In Security:** After the database is updated post user registration the user needs to use the registered Username and password to login.



*Sign In Page*

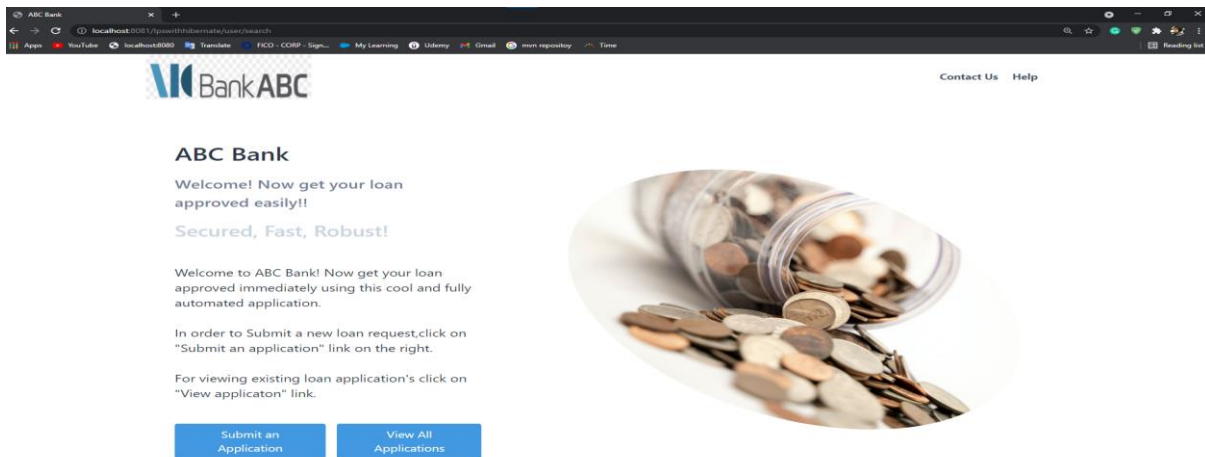
If the user enters invalid credentials, then a pop-up window is shown.



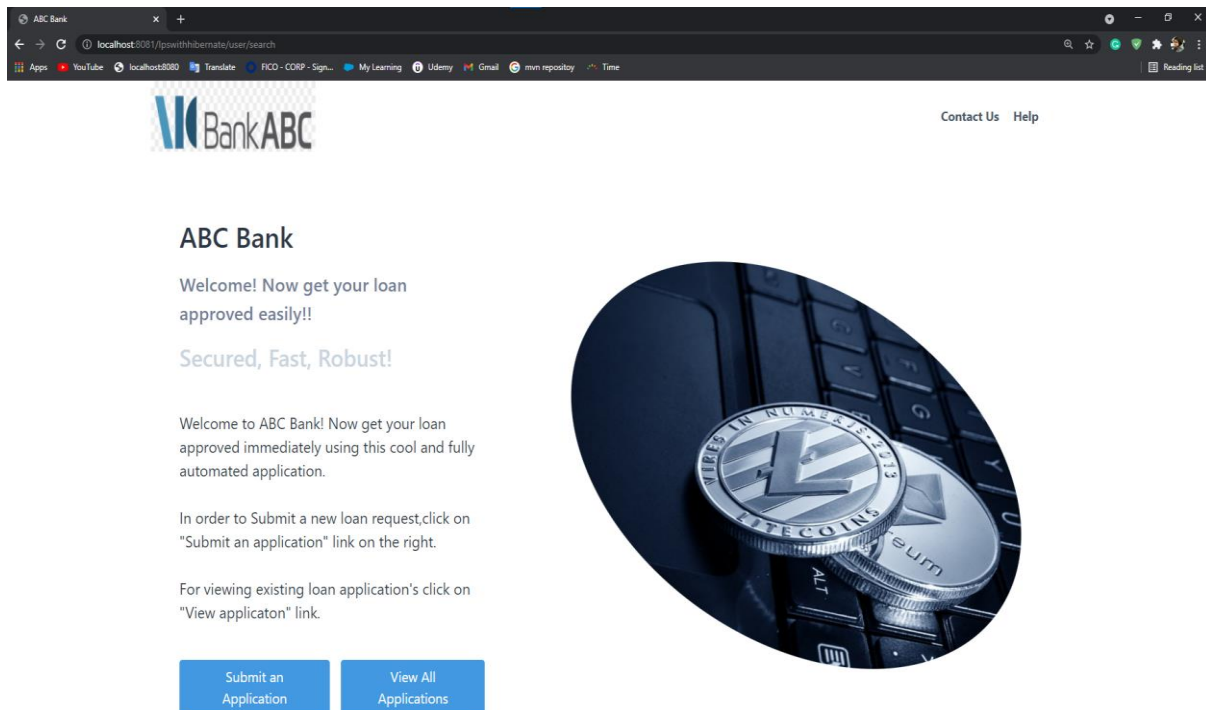
### *Sign In Failure*

On Successful Sign In the user is redirected to the ABC Bank Home Page.

**Home Page:** The Home Page has a Nav bar with the Contact Us and Help Page references. And it also contains two buttons for Submit and View application respectively. The page attraction lies with the use of Unsplash API which makes the UI much more attractive. The Unsplash API inserts a new image related to banking in the page on every refresh action.

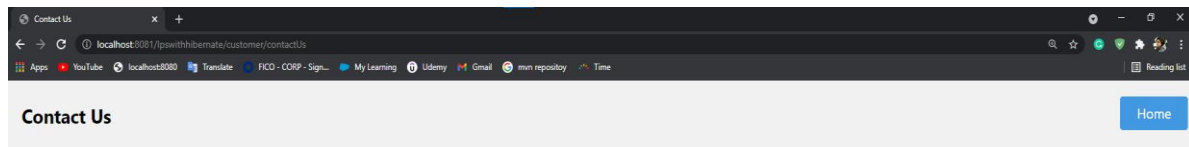


### *Home Page*

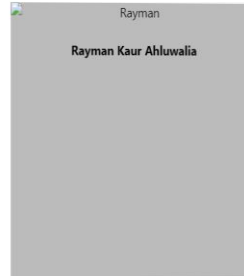


***Unsplash API refreshes page image.***

**Contact Us:** This page consists of cards with developers contact details at the back of card so that the developers can be contacted in case of any technical glitch.



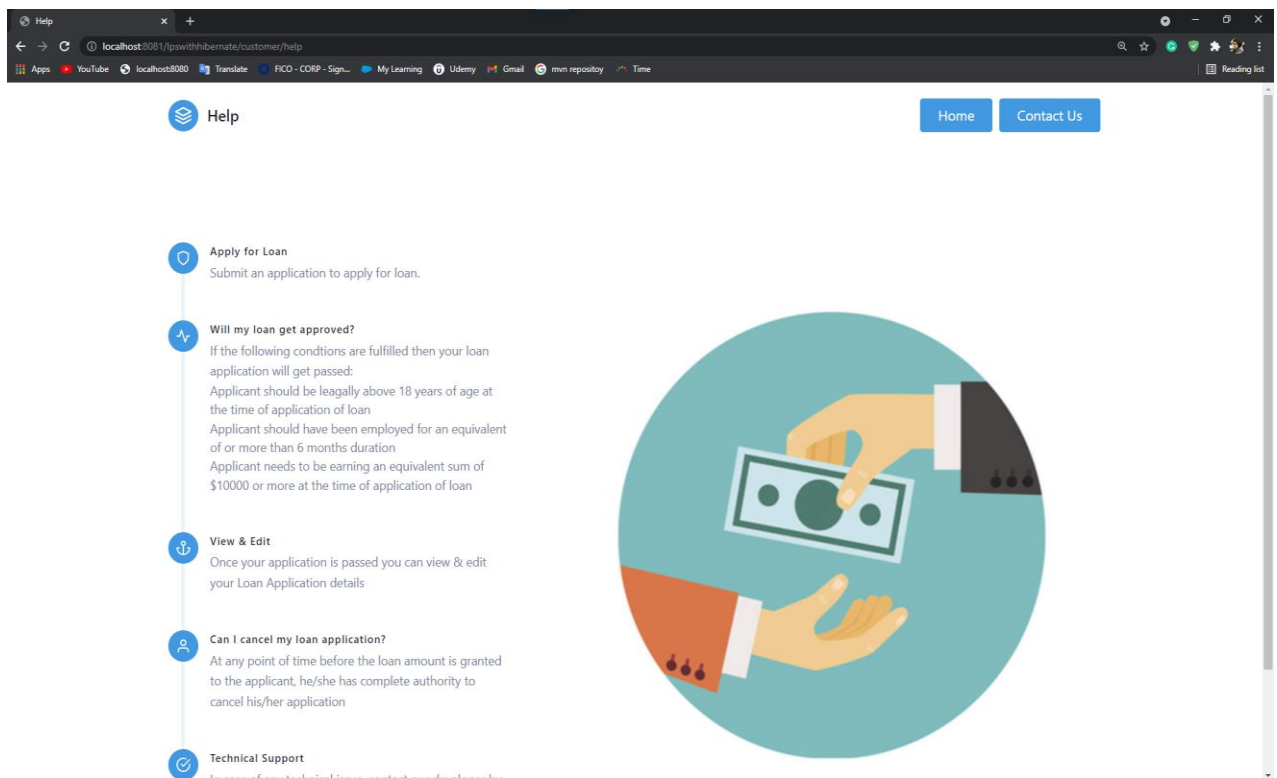
Niyati Sinha



Rayman  
Rayman Kaur Ahluwalia

### Contact US Page

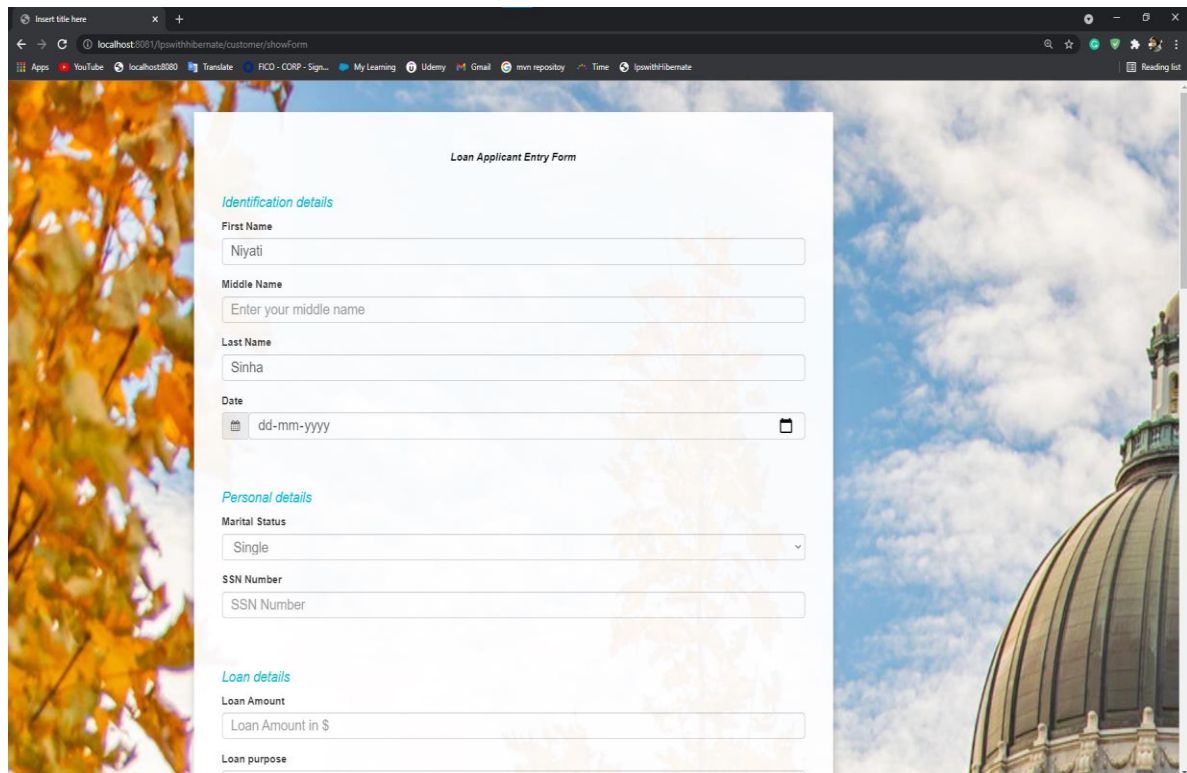
**Help:** This page consists of all the eligibility details for the loan applicant. And it also helps a new user to know about the web application and its functionalities.



### Help Page

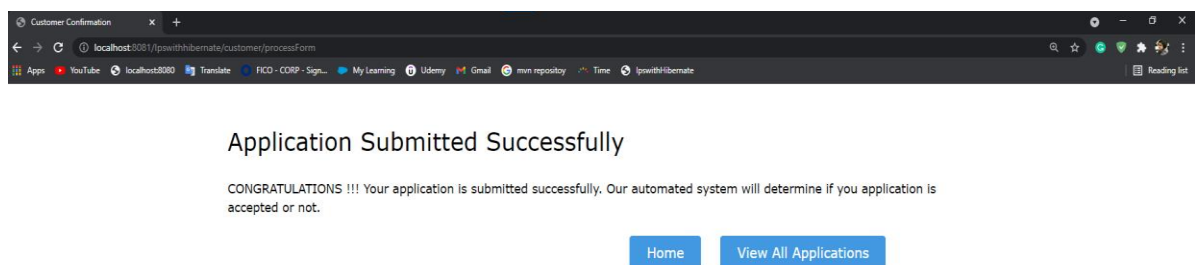


**Submit an Application:** The loan applicant is required to fill all his details which will be checked for various validations and required fields. Like, there will be a minimum loan amount restriction, loan applicant age and salary boundaries etc.

A screenshot of a web browser displaying a form titled "Loan Applicant Entry Form". The form is divided into three sections: "Identification details", "Personal details", and "Loan details". The "Identification details" section includes fields for First Name (filled with "Niyati"), Middle Name (placeholder "Enter your middle name"), Last Name (filled with "Sinha"), and Date (placeholder "dd-mm-yyyy"). The "Personal details" section includes a Marital Status dropdown (set to "Single") and an SSN Number field (placeholder "SSN Number"). The "Loan details" section includes a Loan Amount field (placeholder "Loan Amount in \$") and a Loan purpose field. The browser's address bar shows the URL "localhost:8081/pswithhibernate/customer/showForm".

### *Application to apply for loan*

On Successful Submission the user is redirected to the following page.

A screenshot of a web browser displaying a confirmation page titled "Customer Confirmation". The page has a heading "Application Submitted Successfully" and a message: "CONGRATULATIONS !!! Your application is submitted successfully. Our automated system will determine if you application is accepted or not." Below the message are two buttons: "Home" and "View All Applications". The browser's address bar shows the URL "localhost:8081/pswithhibernate/customer/processForm".

### *On Successful Submission of Loan Application*

**View all applications:** This page contains all the entries and records of all the loan applications. Particular application can be searched by Loan Applicants first name. And all CRUD operations i.e. CREATE, READ, UPDATE and DELETE operations can be performed here. The View page also has a DOWNLOAD button that is used to download the Loan Applicants details in form of a local pdf for future use. On clicking on the table

headers, the table grid gets repopulated according to the data in ascending and descending order.

Search customer:  Search

Application ID	First Name	Email Address	Submitted Date	Action
1	Niyati	1805501@kilit.ac.in	2021-09-25	<a href="#">View</a>   <a href="#">Delete</a>
2	Rayman	aA@GG	2021-09-25	<a href="#">View</a>   <a href="#">Delete</a>
3	IronMan	TonyStark@avengers.com	2021-09-25	<a href="#">View</a>   <a href="#">Delete</a>
4	Thor	Thor@Asgard.in	2021-09-25	<a href="#">View</a>   <a href="#">Delete</a>
5	Thanos	Thanos@InfinityStones.com	2021-09-25	<a href="#">View</a>   <a href="#">Delete</a>

Add a customer Refresh Applications Home

### *View All Applications*

#### *Application Status*

#### *Download*

Applicant ID:- 1  
Applicant Name:- Niyati  
Loan Purpose:- Educational L  
Application Status:-**APPROVED**

**Identification details**

First Name

Middle Name

Last Name

Date

**Personal details**

Marital Status

SSN Number

**Loan details**

[Download](#)

### *View an Application*

The complete UI is responsive and there a few improvements which will be improved in the future versions.

## References

- [1] <https://learning.oreilly.com/videos/learn-java-unit/9781789340648>
- [2] <https://www.youtube.com/watch?v=9Pzj7Aj25lw>
- [3] <https://www.tutorialspoint.com/jira/index.htm>
- [4] <https://www.geeksforgeeks.org/>
- [5] <https://www.w3schools.com/>
- [6] <https://maven.apache.org/>
- [7] <https://hibernate.org/orm/downloads>
- [8] <https://www.javatpoint.com/spring-mvc-tutorial#:~:text=A%20Spring%20MVC%20is%20a,Inversion%20of%20Control%2C%20Dependency%20Injection.>
- [10] <https://docs.spring.io/spring-framework/docs/3.2.x/spring-framework-reference/html/mvc.html>
- [11] [https://en.wikipedia.org/wiki/Dynamic\\_web\\_page](https://en.wikipedia.org/wiki/Dynamic_web_page)
- [12] <https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>