CIS6003_Advanced_Programming_Dilshan_Neelaka_CL_BSCSD_21_41.docx

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Advanced Programming

Individual Assignment

By

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BSc. In Software Engineering
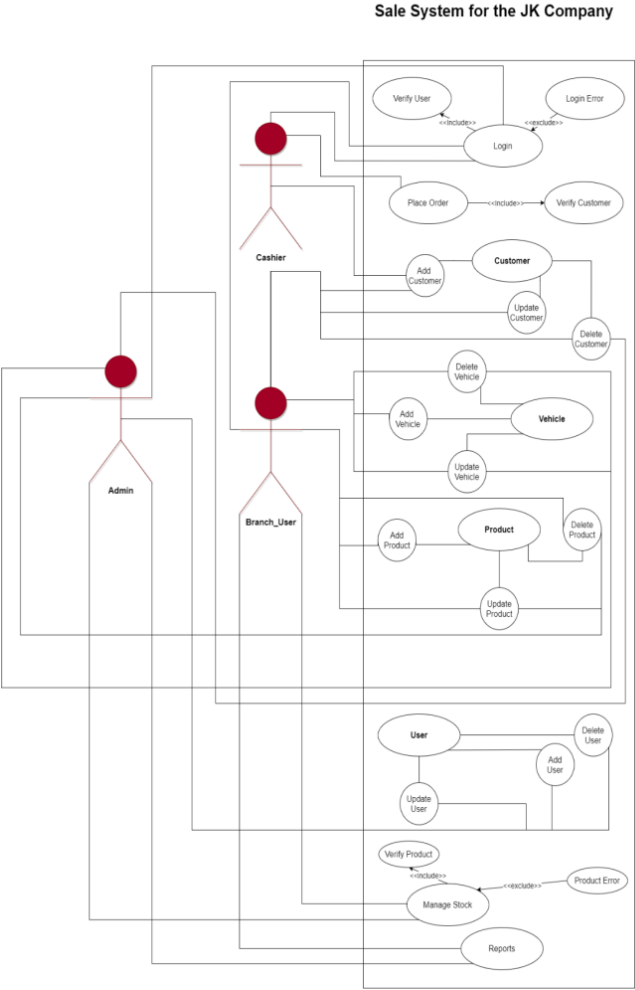
CL/BSCSD/21/41

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Task A

Functional and Non-Functional Requirments

According to the scenario provided this is the proposed system Functional and Non-Functional requirements for the distributed application with the web service,

Functional Requirements	Non-Functional Requirments
1) Client should be able to log into this application.	1) Application to be displayed in more than two languages.
2) Ability to order products online from the application.	2) Application should be user-friendly.
3) Should be able to display company details and contact details via the application.	3) Application looks creative and attractive.
4) Customer will be able to contact the JK company through the E-mail facility.	4) Ability to check locations of JK companies.
5) Able to navigate quickly.	5) Display useful links.
6) Should be able to check the audit trackings.	
7) Should be able to check the last year/ last month's financial reports.	
8) Should be able to check the latest products with values.	

Task B

Use case diagram

Sale System for the JK Company

| Use case ID	UC1
Use case name	Check the orders.
Actor	Cashier
Standard flow	1. The cashier can place the orders. 2. The cashier can log into the system. 3. The cashier has the permissions to add/delete customers.

Use case ID	UC2
Use case name	User Permissions.
Actor	Branch User
Standard flow	1. The branch user has permission to add/update and delete the customers. 2. The branch user has permission to add/update and delete the vehicles. 3. The branch user has permission to generate the reports. 4. The branch user has permission to add/update and delete the products. 5. The branch user has permission to verify the products before releasing the stocks if it is not available in the system, the system will automatically popup the error message.

Use case ID	UC3
Use case name	Admin access.
Actor	Admin
Standard flow	1. The admin has all the system permissions. 2. Only the admin has permission to add/delete and update users.

This sales system automatically checking and verifying the user name, user passwords, user validity, and user rights. It is recommended to keep the system up to date which is useful to block the resigned users from the system.
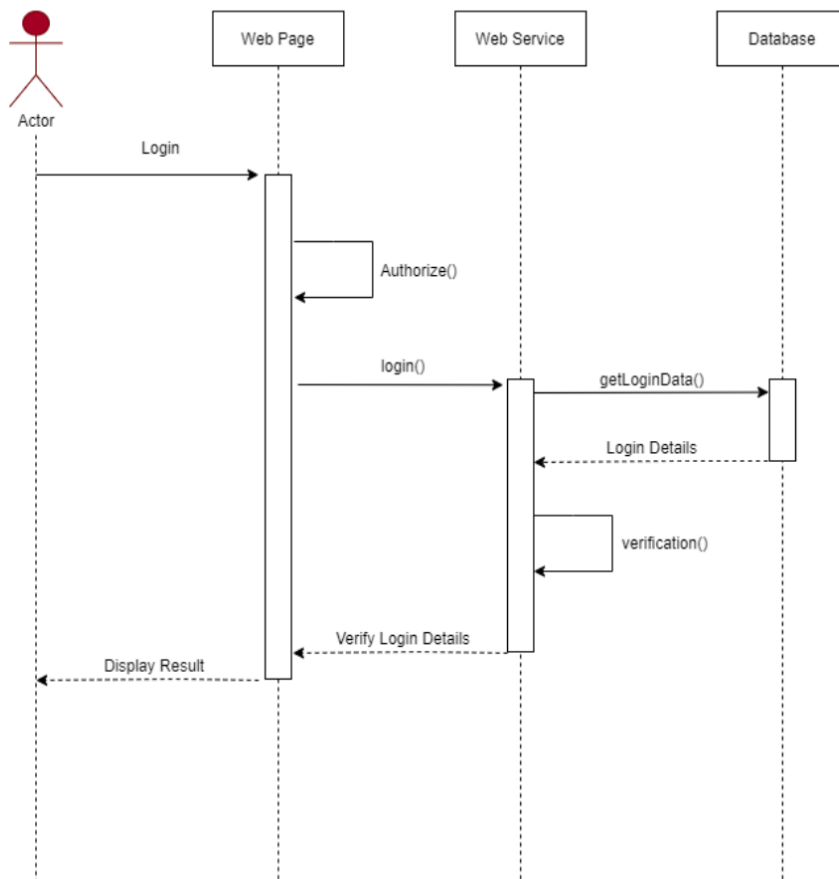
Class diagram

Class Diagram for the JK Company
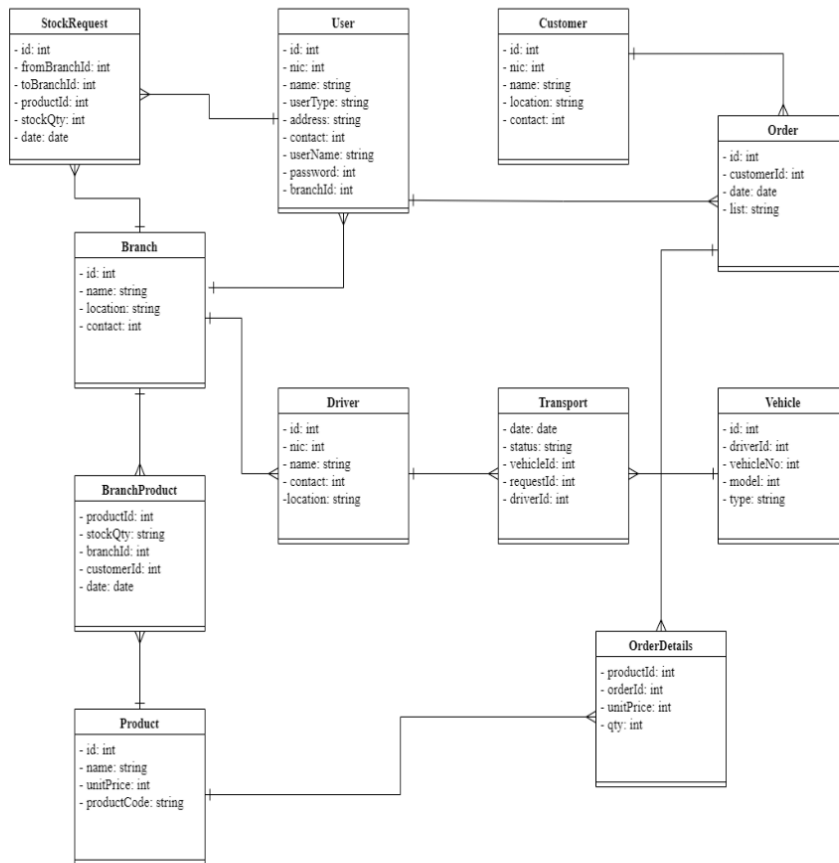
This diagram illustrates which relationships between the main modules and what are the many to many relationships and many to one relationship.
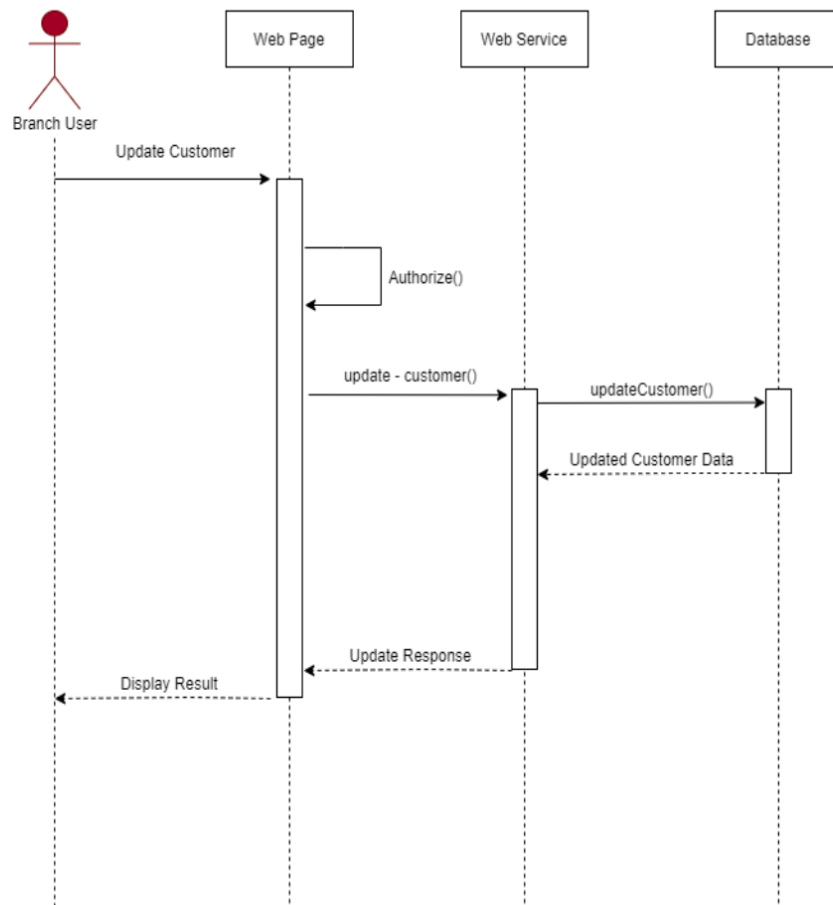
Sequence diagrams

Login Screen Sequence Diagram (JK Company)

In this scenario, the user will be able to login into the web application with his/her credentials. From the backend, it will automatically check the user's validity details and other relevant details from the database.

**Update Customer Sequence Diagram (JK Company)**

In the customer update scenario, the branch user will be able to update the customers in the system. Once the branch user will update the customer via the web application it will automatically update all details to the database.

Product Delete Sequence Diagram (JK Company)
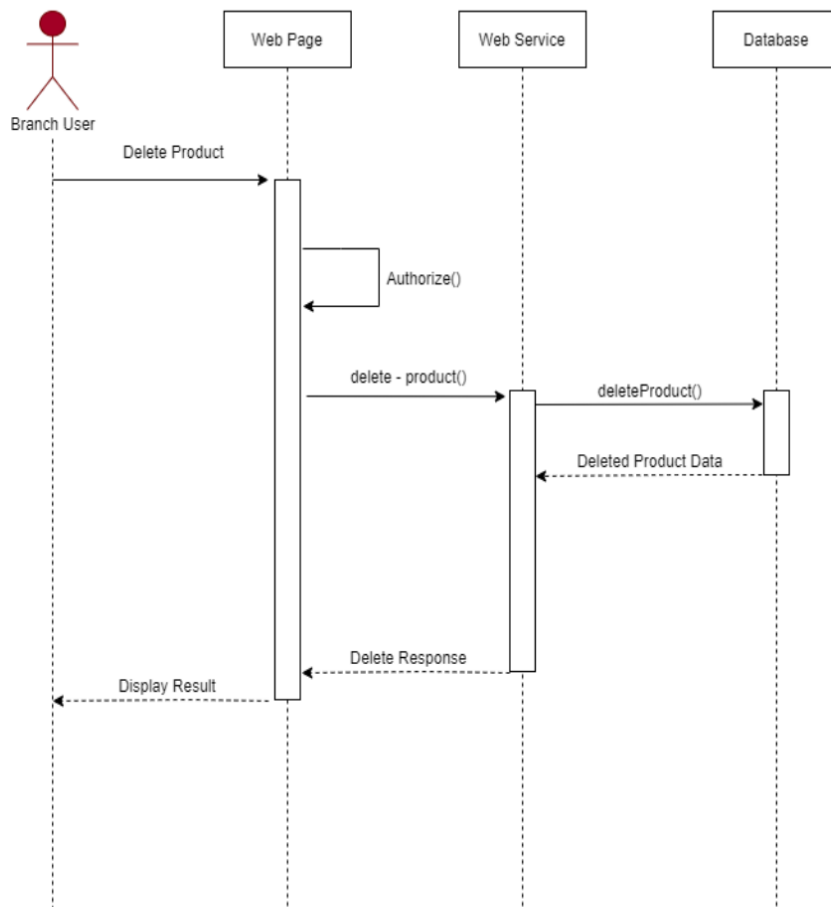
In this scenario, the branch user will be able to delete the products from the system. Once he/she deletes the product details from the system it will automatically delete the relevant details and update the database.

Add User Sequence Diagram (JK Company)
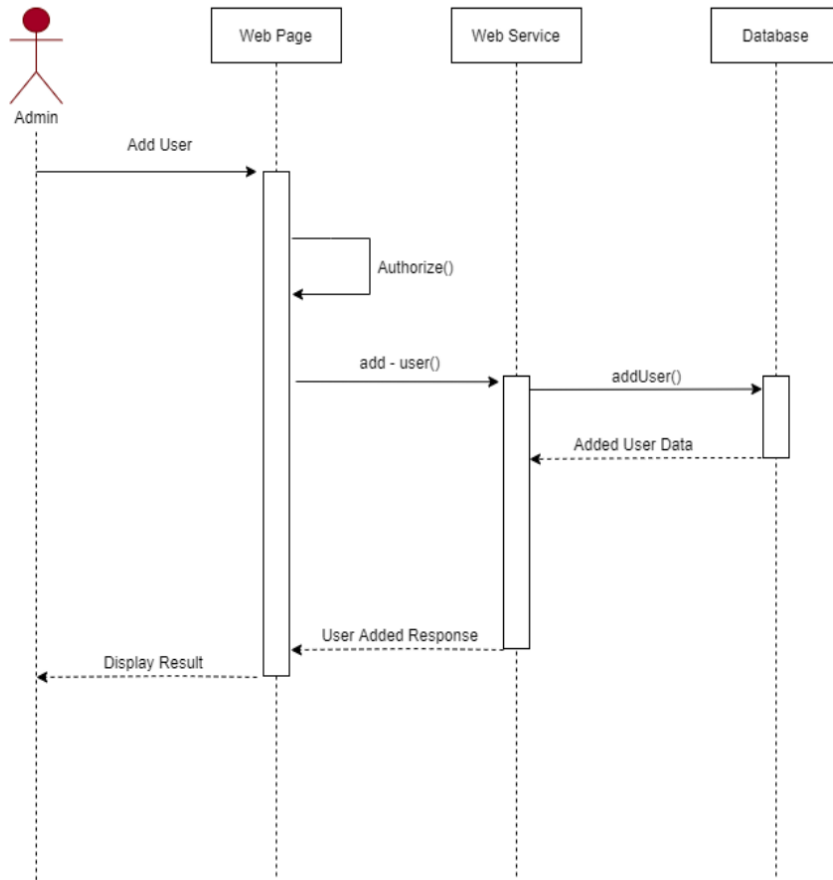
At this point, the user adding rights will only be available for the system admin. Admin will also be able to add the users at any time. Once the admin adds a user into the system, the system will be able to get the newly added user details and it will be automatically updating the database and preview the relevant details.

Task C

In the design patterns module, there are three main designs and they are known as the gang of four design patterns. These are the three key design patterns, Creational, Structural, and behavior design patterns. Under creational design patterns, there are many important design patterns available such as singleton design patterns, abstract design patterns, factory method design patterns, etc. (Gamma, et al., 1994) Singleton design pattern suggests a class that can only be instantiated once, and global point of access to instance provided. This pattern associated with a significant number of benefits such as;

1. The greater amount of memory savings because the object is not created in each request. Only the single instance reusing again.
2. It can be inherit from the other classes.
3. It can be lazy-loaded.

Under the creational design patterns, there is another sub popular pattern named called abstract design pattern. This pattern is mainly used for the creation of families of objects. Objects of a family are designed for working together. The abstract design patterns provide an interface to create families of related or base on the objects. But there is no need to defining the concrete classes of the objects create. Same as a singleton design pattern, abstract design pattern also has its unique advantages that are listed below,

1. Eases the exchanging of object families.
2. Isolate the customer code from concrete classes.
3. It advances consistency among objects.

In the creational design patterns, there is another important sub design pattern name called the factory method design patterns. factor method design patterns are utilized when we have a superclass with different sub-classes and depend on the information, we need to restore one of the sub-class. This factory method design pattern assumes out the liability of the instantiation of the class from the customer program to the factory class. The pros of factory method design patterns are as follows.

1. Provides an approach to the code for interface rather than execution.
2. Provides an abstraction between execution and customer classes over the inheritance.

Task E

Test-driven development is the method of developing and running automated tests before the final development of the application. As a developer, it is always recommended to test our existing code before implementing the new code. It will help to avoid replication of code as we write a small amount of code at a time to pass the test. In the test-driven development there are so many benefits and drawback,

Benefits	Drawbacks
1) Early bug identification	1) Slow Process
2) Save time	2) Additional workload
3) Easy to maintain	3) Continues modifications
4) Easy to refactor	
5) Less debugging	

According to my project, I'm going to do the TDD for each module. As an example, in the branch model testing what are the branch controllers adding, editing, and deleting. If something wrong with the adding, editing, or deleting part it will automatically provide the result as failed. If all the parameters are successfully completed the result provides a passed. And it's easy to identify the issues quickly.

Task F

User Documentation

Login Page
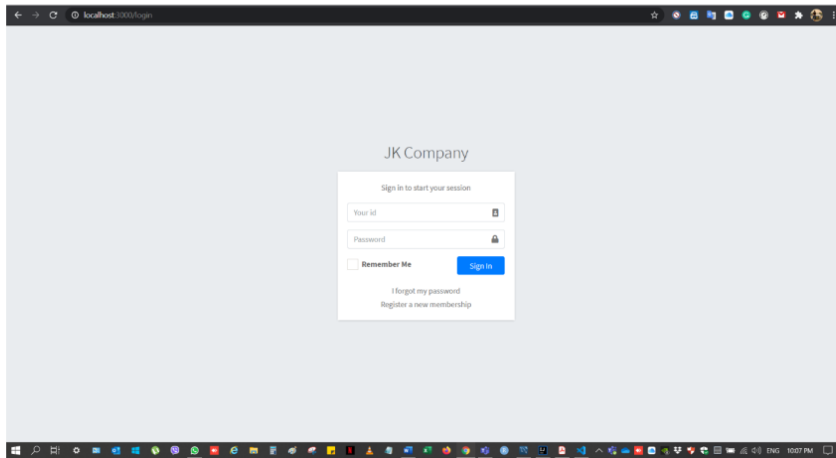
This window shows the login page of the JK company. In order to access the system as the super admin following user name and password should be used,

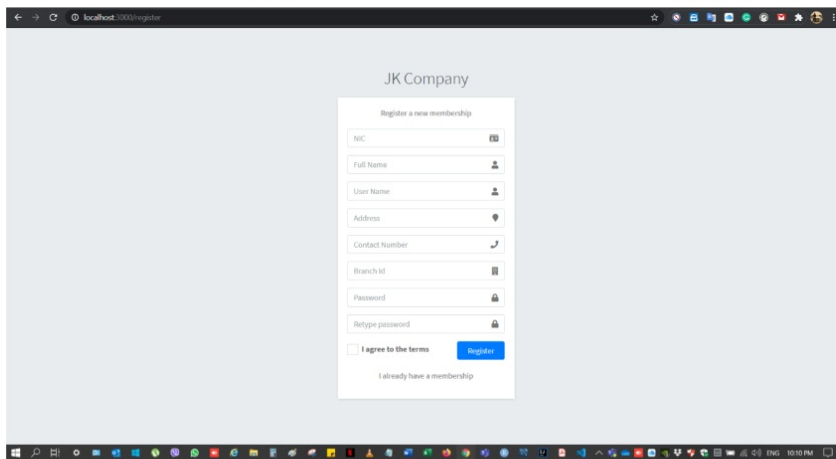Super Admin User Id:- 555

Super Admin Password:- .123

If you want to access as a standard user following user name and password should be used,

Branch User Id:- 222

Branch User Password:- 123456

Please note that this is a fully functional system (Database, Backend, and Frontend are integrated) and therefore any other user name or password which are not assigned will not allow you to get access to the system.
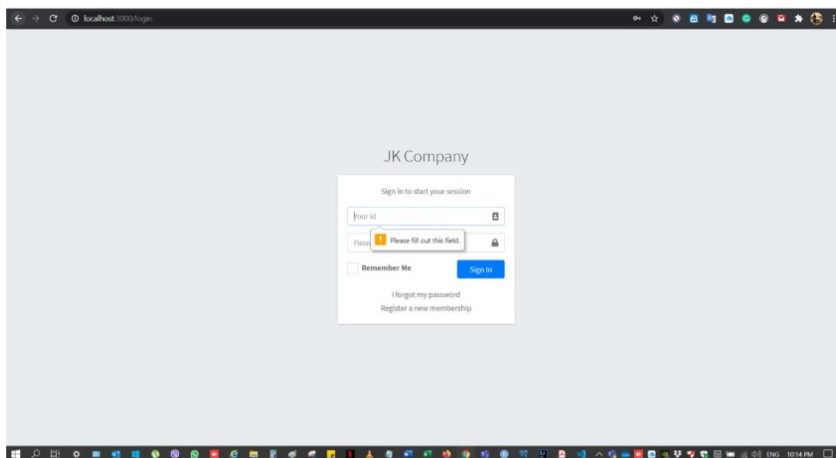
Register a new membership page

This window shows the new membership creating a form of the JK company.

Wrong Login Credentials Page

If you enter the wrong credentials into the system, the system will automatically popup the error message.

Dashboard
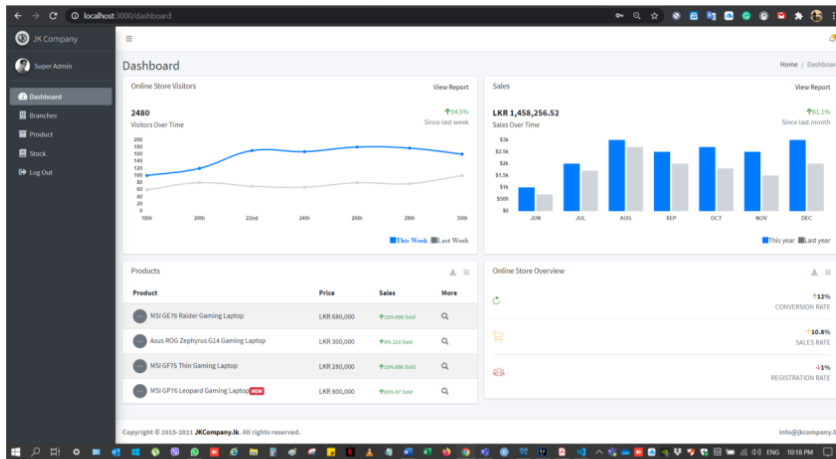
Once you enter the correct ID & Password system will popup the dashboard of the JK company.
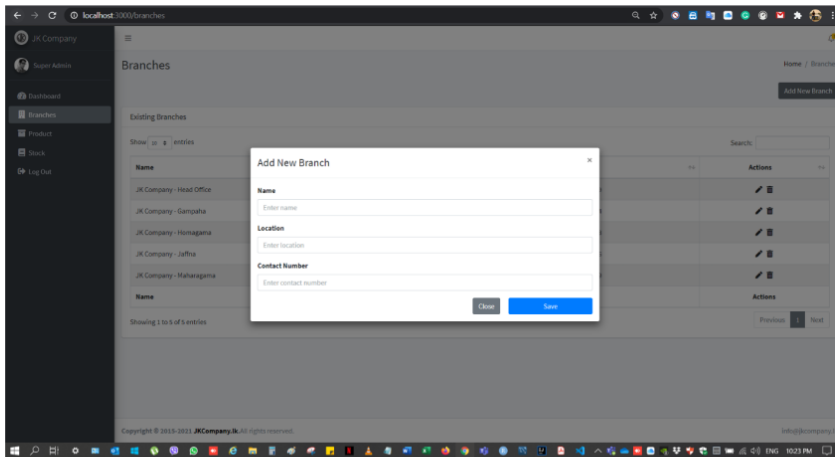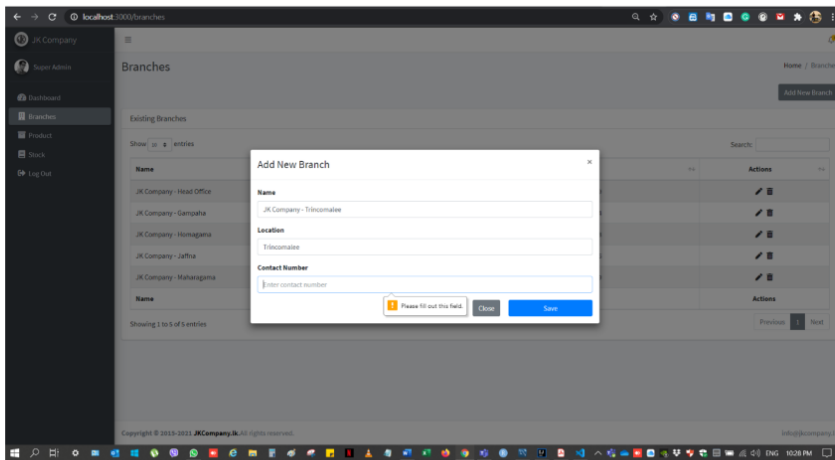
Branches Tab

In the branches tab, it will appear the existing branches of the JK company.
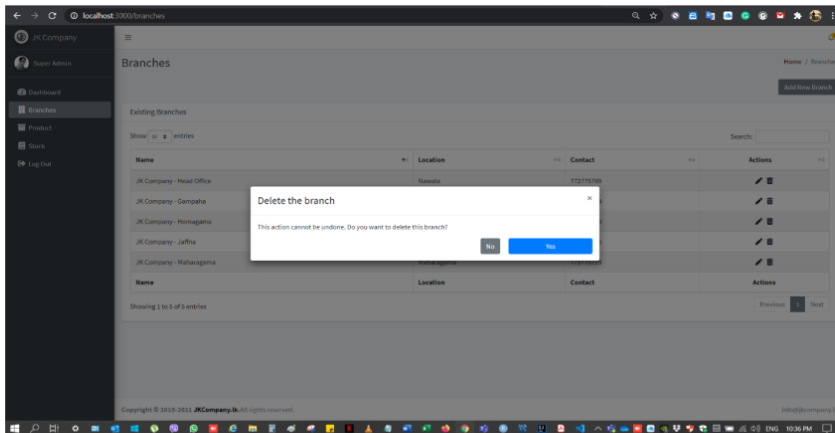
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Add New Branch

This window shows the add new branches form of the JK company.
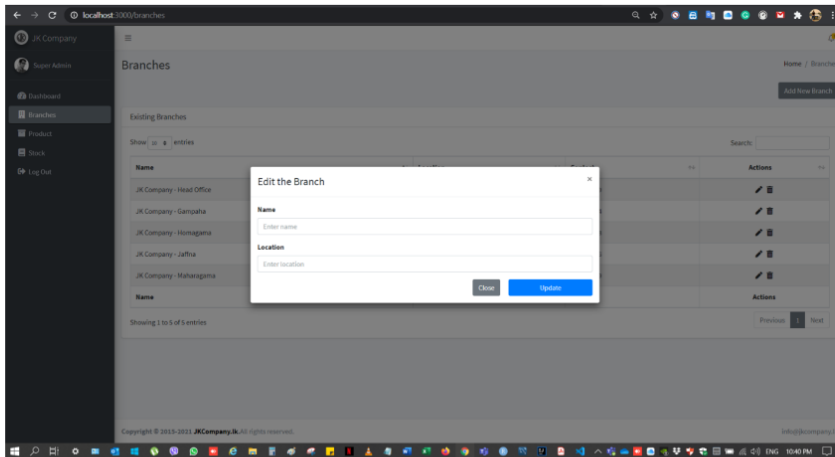
Error Message of the Add New Branch

This window shows add a new branch error message because you need to enter all required details into the system.

Delete and Edit Branch

If you need to delete one existing branch you can directly click the bin button in the actions and it will be automatically appearing in this confirmation message.

This window shows the editing part of the branches. If you are required to change the branch name or location in your existing branches, you can directly change it via the action panel.

Product Tab

In the product tab, it will appear the current product name and relevant stock details of the JK company.

Add New Product

This window shows the add new product form of the JK company.

Error Message of the Add New Product
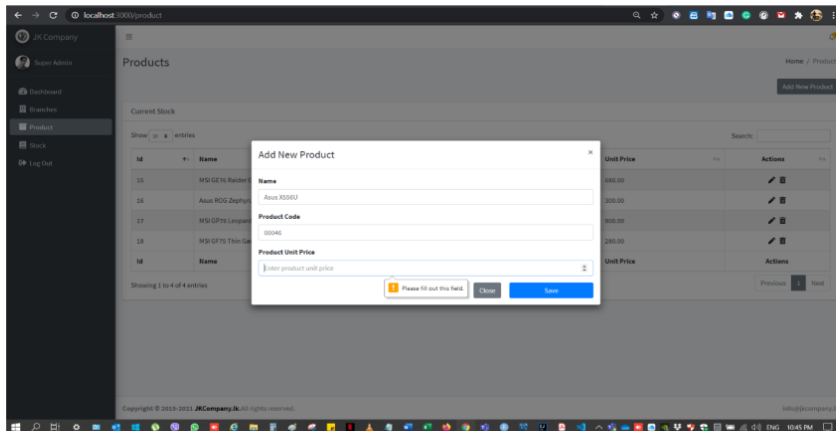
This window shows add a new product error message because you need to enter all required details into the system.

Delete and Edit Products

If you need to delete one existing product, you can directly click the bin button in the actions it will be automatically appearing in this confirmation message.

This window shows the editing part of the products. If you are required to change the product name or product code in your existing stocks, you can directly change it via the action panel.

Stock Tab

In the stock tab, it will appear the branch to branch transport details/stock quantity and Head office to branch transport details and stock quantity of the JK company.

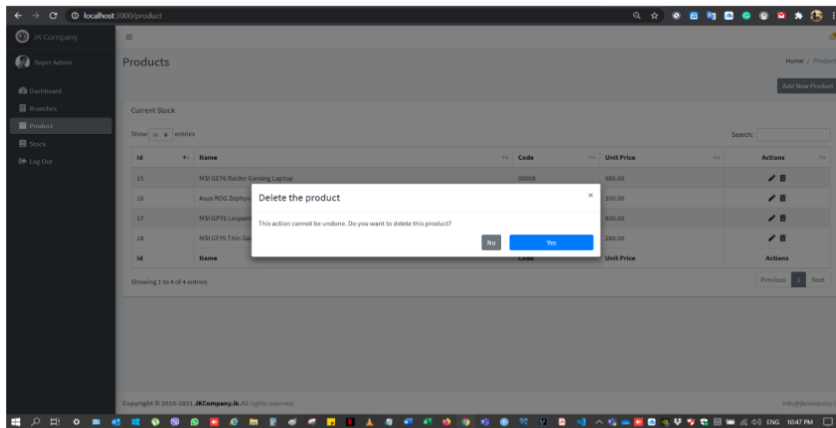**Add New Stock Entry**

This window shows the adding new stock entry form of the JK company.

Error Message of the Add New Stock Entry
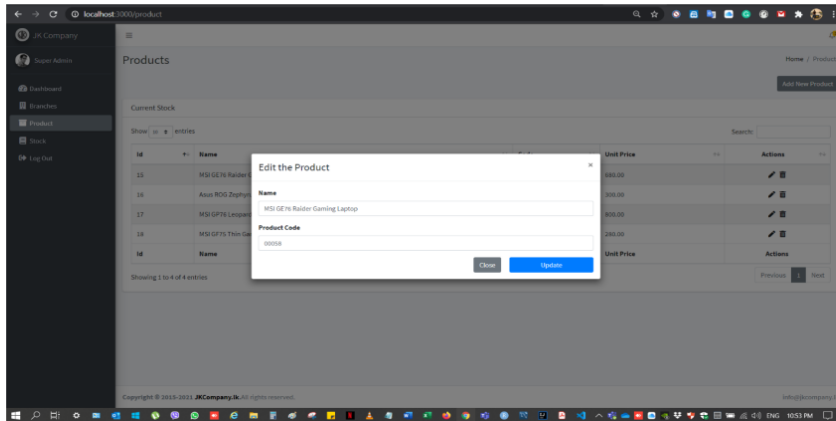

This window shows adding a new stock entry error message because you need to enter all required details into the system.
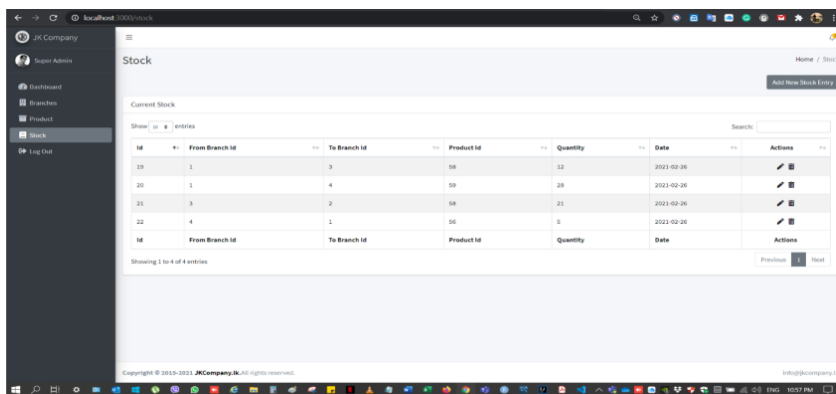
Delete and Edit Stock Entry
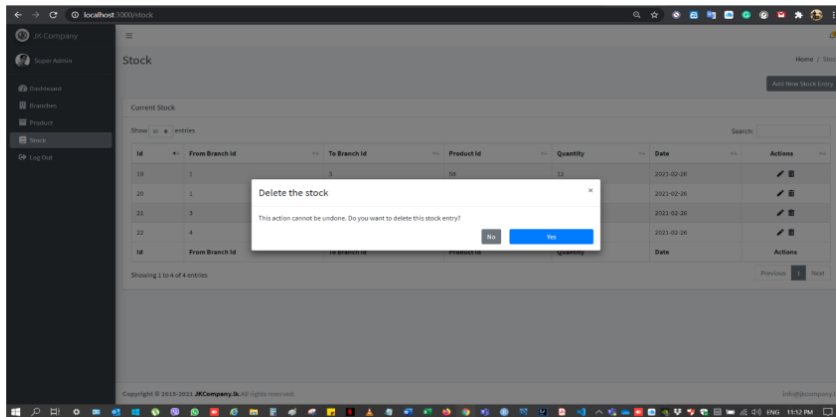
If you need to delete one existing stock entry, you can directly click the bin button in the actions it will be automatically appearing in this confirmation message.
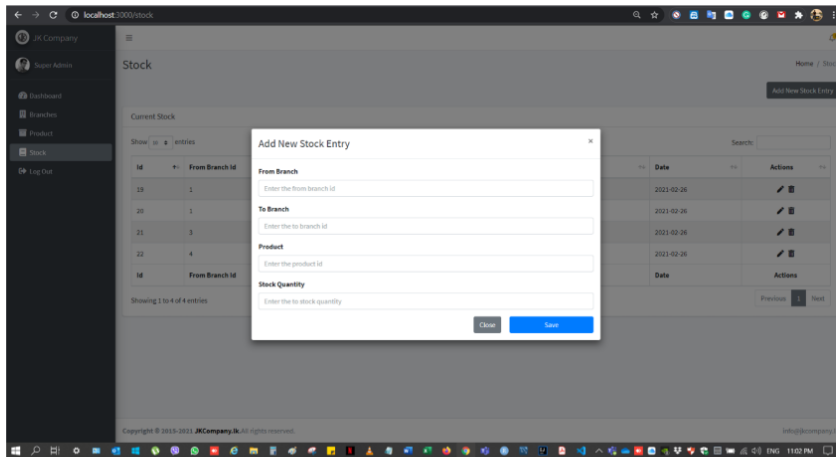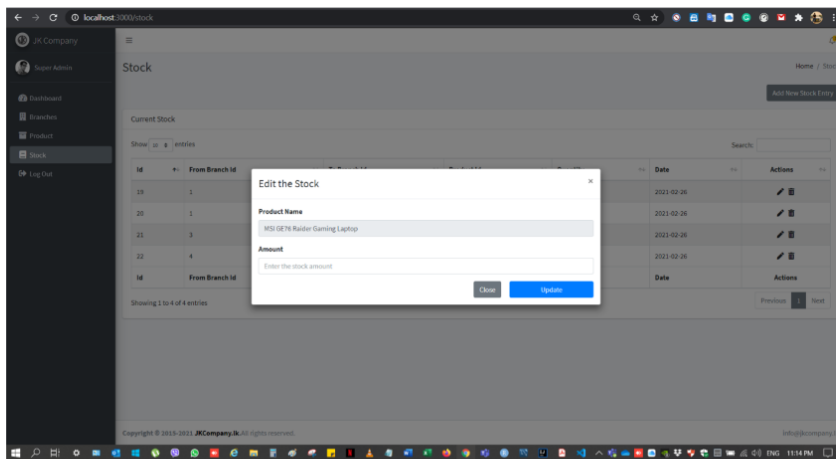

This window shows the editing part of the stock entry. If you are required to change the stock name or stock amount in your existing stocks, you can directly change it via the action panel.
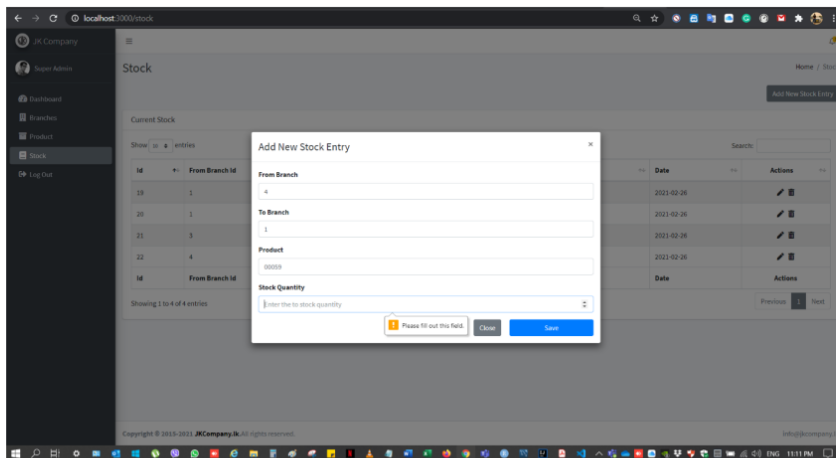
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Signout Tab
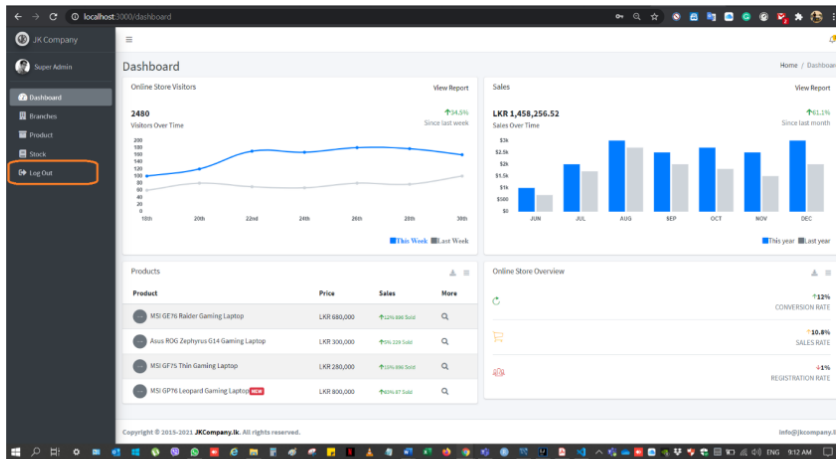
Once the transactions are completed please use Log out button to sign out from the system and you will be directed to the login page.

Technical Documentation

Technical Requirments

Server	Apache Tomcat Server
Database	My SQL Workbench 8.0
Frontend	Node.js

To deploy this system I used an apache tomcat server for the services and the system data connected with the My SQL database. If any required to check this system workability he/she can directly connect to the database to the My SQL, run the backend from any terminal, and start the front end from the visual studio code.

Task G

Prior to initiating the process of developing a website for a client, there are key ethical practices to be followed by web professionals. Ethical web developers should always avoid cybersquatting which is also known as domain squatting. And avoid diffusion of malicious program codes purposely. Furthermore, the developer should never share emails containing threats. Also, customers should always be fairly charged for the technical services provided by the developer (Oklahomaschool, 2013).

In the given case scenario, I had the task of developing a sales system for the JK company where I had to carry out my work according to the ethical practices mentioned above. In order to successfully complete the given project of developing a sales system for the JK company, I as the developer primarily used few popular tools covering two main contexts of the website, backend and front end. All the software utilized for this purpose is open source applications that are not identified as cracked versions. As the first stage of the process, I initiated creating the database using one of the famous database creation tools, My SQL workbench 8.0 due to the convenience and latest features of this application. As mentioned in the first paragraph I avoided purchasing domain names that are not intended to use by me. Therefore, I conducted this stage in an ethical manner by avoiding domain squatting.

As the second step, IntelliJ IDEA Community Edition has been used for the coding purpose and will serve to connect the backend and front end of the website. to write the codings for the frontend, Visual studio code was used that supports the HTML version. During the software craftsmanship which involves the development of both backend and frontend, I have not relied on any third-party codings from any other terminals. This means that I have not relied on any sort of third-party codings that are created before by ICT professionals and therefore, all the codings that are created are an original piece of work of mine. Furthermore, I have not included any malicious codings such as viruses or worms that will be useful for tracking confidential information of the company after the given project is completed and the contract is terminated by both parties. This means that I as a developer carried out my tasks without jeopardizing the trust and privacy of JK Company.

The final stage consists of creating an attractive and user-friendly interface for the website. According to many ICT specialists, the client-first impression of the company totally relies on the creativity and attractiveness of the webpage, and therefore, the developer should have the required

skills to introduce a unique and innovative interface. Same as the first two steps mentioned above, I used my own skills and knowledge to emerge up with a suitable interface. This means the images, contents, or designs included in the interface are not obtained without legal permission. Most of the images and contents are collected through open-source links Therefore, all the tasks involved in this stage have been carried out especially according to the **Copyright, Designs, and Patent Act 1988.**

As mentioned in this chapter all the deployed software for this project can be freely accessed by anyone and may not conflict with any of the regulatory Acts in the ICT legal framework.

References

Gamma, E., Helm, R., Johnson, R. & Vlissides, J., 1994. *Design Patterns: Elements of Reusable Object Oriented Software.* s.l.:Addison-Wesley.

Oklahomaschool, 2013. *Ethical and Legal Issues in Web Development.* [Online]
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[Accessed 26 February 2021].

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