

ASSIGNMENT- 1

Course Code	CSC402A
Course Name	Web Architecture and Application development
Programme	B. Tech
Department	Computer Science and Engineering
Faculty	FET

Name of the Student	K Srikanth
Reg. No	17ETS002124
Semester/Year	3 rd / 6 th Semester
Course Leader/s	Mr. Kishore S. M.

Declaration Sheet			
Student Name	K Srikanth		
Reg. No	17ETCS002124		
Programme	B. Tech	Semester/Year	3 rd / 6 th Semester
Course Code	19CSC215A		
Course Title	Web Architecture and Application development		
Course Date	18/03/2021	to	29/06/2021
Course Leader	Mr. Kishore S. M.		
<p>Declaration</p> <p>The assignment submitted herewith is a result of my own investigations and that I have conformed to the guidelines against plagiarism as laid out in the Student Handbook. All sections of the text and results, which have been obtained from other sources, are fully referenced. I understand that cheating and plagiarism constitute a breach of University regulations and will be dealt with accordingly.</p>			
Signature of the Student	K Srikanth	Date	22/04/2021
Submission date stamp (by Examination & Assessment Section)			
Signature of the Course Leader and date		Signature of the Reviewer and date	

Faculty of Engineering and Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	Programme	B. Tech
Semester/Batch	06/2018		
Course Code	CSC402A	Course Title	Web Architecture and Application development
Course Leader	Mr. Kishore S. M.		

Assignment					
Register No.		K Srikanth	Name of the Student		17ETCS002124
Sections		Marking Scheme	Marks		
			Max Marks	First Examiner Marks	Moderator
Part 1					
	1.1	Functional and non-functional requirements	5		
	1.2	Identification and design of the entity classes using E-R diagrams	5		
	1.3	Design of UML interaction sequence diagrams	8		
	1.4	Design of Algorithm/ Flowchart	7		
		Part- 1 Max Marks	25		

Course Marks Tabulation				
Component- CET B Assignment	First Examiner	Remarks	Second Examiner	Remarks
1				
2				
Total Marks				
<div>Signature of First Examiner</div> <div>Signature of Second Examiner</div>				

Scenario:**(25 Marks)**

In an online Smartphone shopping Web application, users can register and login to the web application. The online smartphone application maintains account details for each user (user ID, user name, phone number, shipping address and items purchased etc.). The user may select any item from the list of available smartphones or can search for all the available smartphones. It is assumed that an item purchased is reserved and made available to the user offline.

Answer the following questions:**(25 Marks)**

List all the functional and non-functional requirements for the given scenario. Identify and design entity classes using E-R diagrams and UML sequence diagrams. Document the following in the report:

1.1 Functional and non-functional requirements**Functional requirements****Table 1.1: Functional requirement 1**

Requirement Tag	FR1
Requirement Description	The system should have an interface where user can be able to register
Dependent on Requirements	-
User/System interacting with the requirement	User

Table 1.2: Functional requirement 2

Requirement Tag	FR2
Requirement Description	The system should have an interface where user can be able to login
Dependent on Requirements	FR1
User/System interacting with the requirement	User

Table 1.3: Functional requirement 3

Requirement Tag	FR3
Requirement Description	The system should be able to store user data.
Dependent on Requirements	FR1
User/System interacting with the requirement	System

Table 1.4: Functional requirement 4

Requirement Tag	FR4
Requirement Description	The system should have an interface where user can be able to see all the products
Dependent on Requirements	-
User/System interacting with the requirement	User

Table 1.5: Functional requirement 5

Requirement Tag	FR5
Requirement Description	The system should be able to show if the product is available or unavailable
Dependent on Requirements	FR4
User/System interacting with the requirement	System

Table 1.6: Functional requirement 6

Requirement Tag	FR6
Requirement Description	The system should have an interface where the user can reserve a product.
Dependent on Requirements	FR4
User/System interacting with the requirement	User

Table 1.7: Functional requirement 7

Requirement Tag	FR7
Requirement Description	The system should have an interface where the user can see his/her order summary.
Dependent on Requirements	FR4, FR5, FR6
User/System interacting with the requirement	User

Table 1.8: Functional requirement 8

Requirement Tag	FR8
Requirement Description	The system should have an interface where admin can add or update or delete the product from the website
Dependent on Requirements	FR4
User/System interacting with the requirement	Admin

Non-Functional Requirements**Table 2.1: Non-Functional requirement 1**

Requirement Tag	NFR2
Requirement Description	The system should be able to manage traffic of incoming requests
Dependent on Requirements	-
User/System interacting with the requirement	System

Table 2.2: Non-Functional requirement 2

Requirement Tag	NFR2
Requirement Description	The system should have easy interface where customer can understand the UI/UX elements.
Dependent on Requirements	FR1, FR2, FR4, FR6
User/System interacting with the requirement	User

Table 2.3: Non-Functional requirement 3

Requirement Tag	NFR2
Requirement Description	The system should have an interface where product details are detailly described
Dependent on Requirements	FR4
User/System interacting with the requirement	System

Table 2.4: Non-Functional requirement 4

Requirement Tag	NFR4
Requirement Description	The system should be able to store user details in a secure way
Dependent on Requirements	FR3
User/System interacting with the requirement	System

Table 2.5: Non-Functional requirement 5

Requirement Tag	NFR5
Requirement Description	The system should be able to load the pages under 7 seconds
Dependent on Requirements	FR1, FR2, FR4, FR6
User/System interacting with the requirement	System

Table 2.6: Non-Functional requirement 6

Requirement Tag	NFR6
Requirement Description	The system should be online 24/7.
Dependent on Requirements	FR1, FR2, FR3, FR4, FR5, FR6
User/System interacting with the requirement	System

Table 2.7: Non-Functional requirement 7

Requirement Tag	NFR7
Requirement Description	The system should undergo maintenance if there are any issues
Dependent on Requirements	FR1, FR2, FR3, FR4, FR5, FR6
User/System interacting with the requirement	System

1.2 Identification and design of the entity classes using E-R diagrams

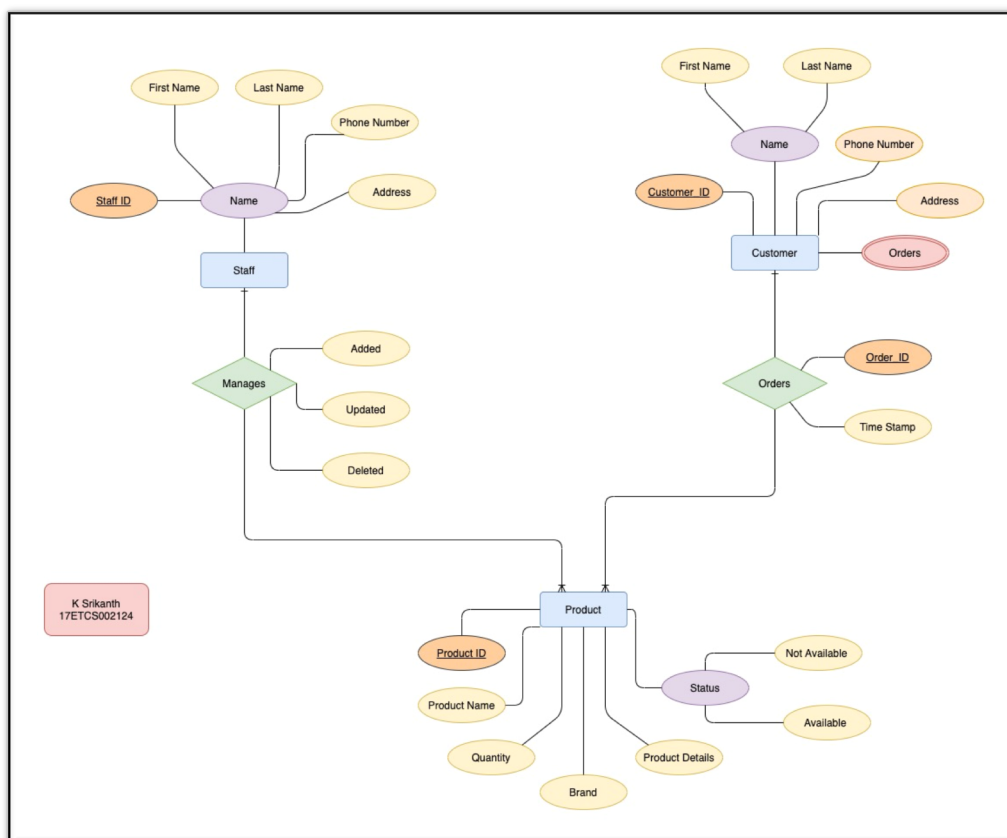


Figure 1 ER Diagram of Given Problem Statement

Given problem statement was to build an online **Mobile Shopping Application**, Figure 1 represents ER Diagram which helps us to build a database schema for our web application

Let's list all the entities, attributes and relations,

Entities: Entities are a real-world object with an existence, we have 3 entities from figure 1

1) Customer Entity

Here in our application Customer is an object and has a certain attribute

a. Customer ID

This Attribute Stores a unique value of every customer who has registered and this attribute is also a primary key

b. Name

This is a composite attribute which stores the first name and last name of the customer and this attribute has a constraint not null.

c. Orders

This is a multivalued attribute because there might be “n” number of orders placed or already has been placed by a customer so this attribute will have a separate table

d. Phone Number

This attribute stores the phone number from the given customer.

e. Address

This attribute stores the address from the given customer.

2. Staff Entity

Staff is an object and has some certain attributes which are,

a. Staff ID

This Attribute Stores a unique value of every Staff Member who has registered and this attribute is also a primary key

b. Name

This is a composite attribute which stores the first name and last name of the customer also this attribute can't be null.

c. Phone Number

This Attribute stores a unique value of the staff phone number so that only one staff user can have one phone number

d. Address

This Attribute stores a unique value of the staff Address so that only one staff user can have one address

3. Product Entity

Finally, Product is also an object and attributes which are,

a. Product ID

This Attribute Stores a unique value of every product which has be entered and this attribute is also a primary key

b. Product Name

This Attribute stores the Product Name and this attribute has a constraint not null.

c. Quantity

This Attribute stores the quantity of the product and this attribute has a constraint not null.

d. Brand

This Attribute stores the brand of the product and this attribute has a constraint not null

e. Product Details

This Attribute stores the details of the product type char array.

f. Status

This Attribute keeps a track of if the all the products if they are available or not and this is of type Boolean.

4. Order Relationship

This Relationship defines that if a customer places an order and how it's going to keep track of it

a. Order ID

This Attribute Stores a unique value when every time a product is ordered by a customer and this is a primary key for this table.

b. Time Stamp

This Attribute keeps a time/date record of when the order was placed. As this relationship is connected between two different entities which are product and customer this table will be having both the keys from the entities.

2. Manages Relationship

This Relationship defines that if an admin tries to perform operations on already listed product such as

a. Added

This Attribute is type Boolean where we can keep a track if admin adds a new product to the product table.

b. Updated

This Attribute is type Boolean where we can keep a track if admin wants to update the already listed product to the product table.

c. Deleted

This Attribute is type Boolean where we can keep a track if admin wants to delete a product from product table.

After Sketching up the ER Diagram now we have to figure out how do you convert a simple ER diagram to a database schema also known as relational schema (Figure 2) which helps us to build the MySQL Relational Database in an ease manner.

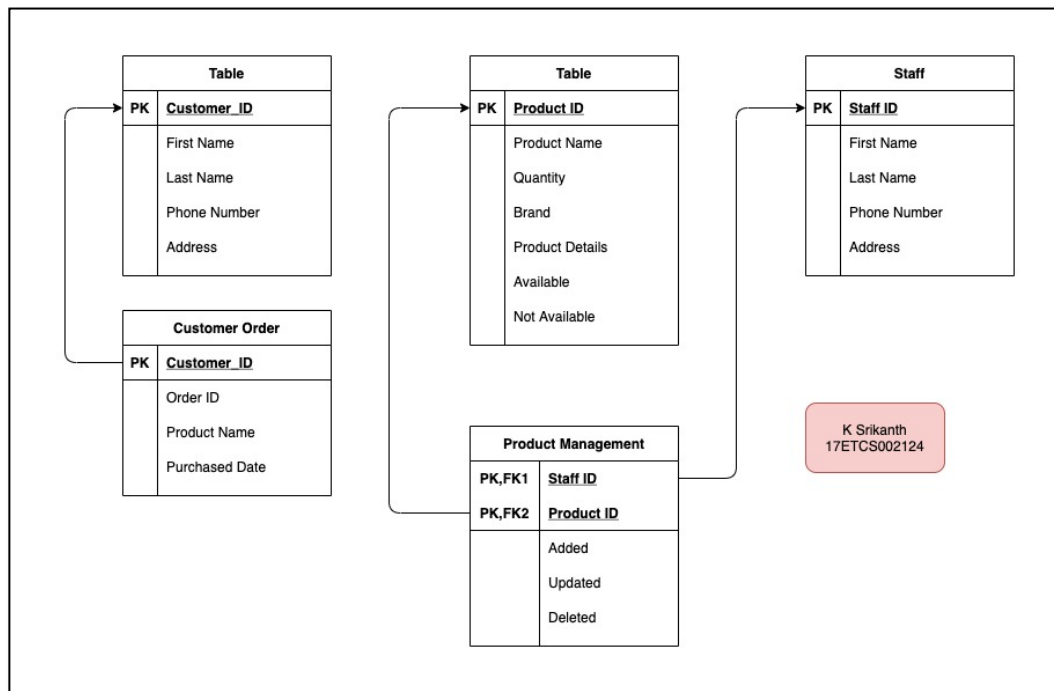


Figure 2 Relational Schema for ER Diagram (Figure 1)

1.3 Design of UML interaction sequence diagrams

User interaction

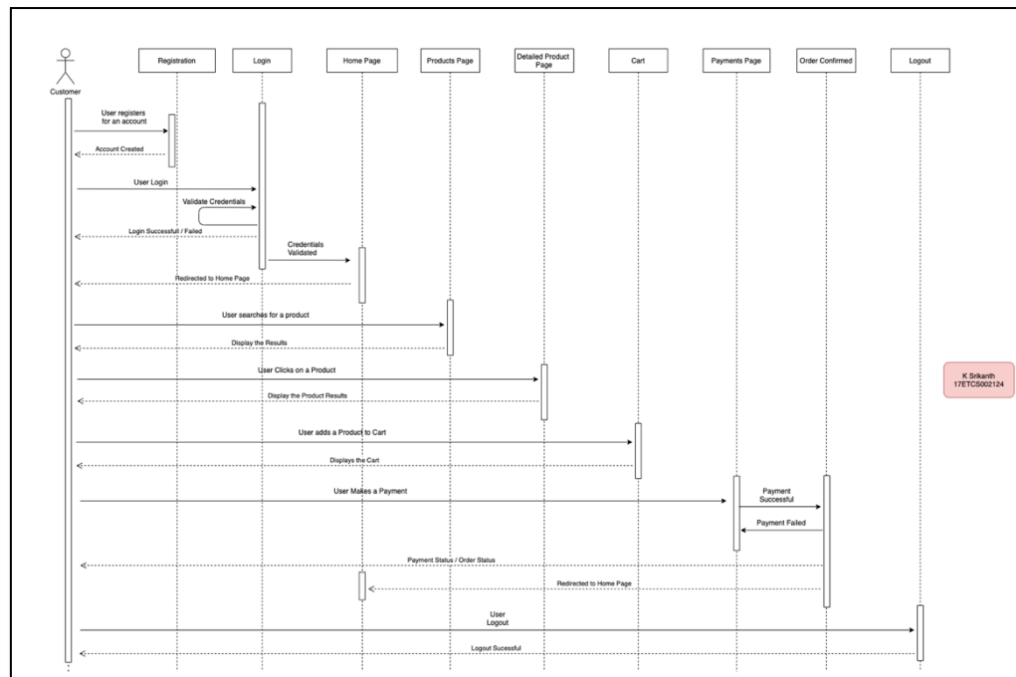


Figure 3 Sequential Diagram for the given problem statement (User)

Sequential Diagrams are used to represent time sequence of the objects like what order is the user is going to interact with the system,

There are two types of users in our case here

1. Customer / User

2. Admin / Staff

Let's see how a customer interacts with our system (Website),

Scenario

Firstly, the user has to register using the interface provide by the system which includes filling up all the necessary details to get started. After registration now user can be able to sign in using the interface provide by our system and system is going to verify if the user's credentials are valid or not and it will display a prompt to the user with a dialog box stating that the user has logged in or failed to login. If the user has failed to login then the user can again enter their credentials on login page. If my dialog box says that successfully logged in then the user will be redirected to the homepage of **Mobile Shopping**

Website where the user can search for their preferred Mobile and system will display the results. Now when user clicks on a product it will be able to displays fully detailed information about the product and user can know about the product much better if they are not aware of the product that they are looking at and user can add the product to the cart section of the website after knowing the details about the product now user have an option where they can be able to buy or reserve the product using a payment gateway if the payment is successful then user will receive an order ID followed by the list of products they have purchased after this they would be getting redirected to the home page of our web application and if the payment is failed then user will have to try the payment again. Finally, if the user is done with their shopping, they can logout of the system.

Now, Let's see how a admin interacts with our system (Website),

Admin interaction

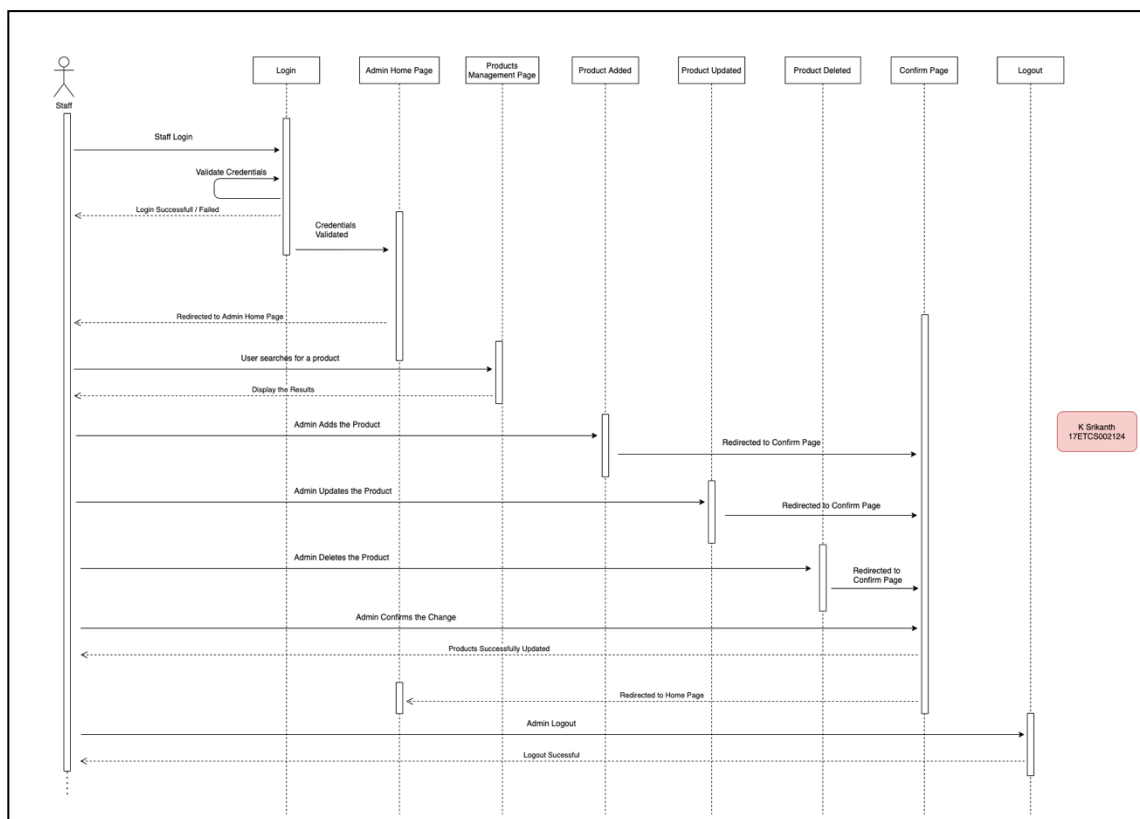


Figure 4 Sequential Diagram for the given problem statement (Admin)

Scenario

The staff administration are going to provide the credentials for admin account where they can make changes to the websites products stock now the admin has to sign in using the interface provide by the system and the system is going to verify if the admin's credentials are valid or not and it will display a prompt to a user with a dialog box stating that the user has logged in or failed to login if the user has failed to login then the user can again enter their credentials on login page. If my dialog box says that successfully logged in then It will be redirected to the homepage of our admin where the admin where admin can search for their Mobile and system will display the results. The four major operations that admin can perform are

1. Add

If admin wants to add a new product for their website, they can do it via creating a new product and uploading the particular details about the product.

2. Update

If admin wants to update details of the product which is up online, they can be able to do it with an edit option on the product page.

3. Delete

If admin wants to delete the product which is up online, they can be able to do it with a delete option on the product page.

4. Website for maintenance

If admin wants to put their website for maintenance, they would be able to do it via settings.

After Performing all the operations, the admin can verify everything like what changes that they made all together and make it online. Finally, if the admin is done making changes with their website, they can logout of the system.

1.4 Design of Algorithm/ Flowchart

User interaction

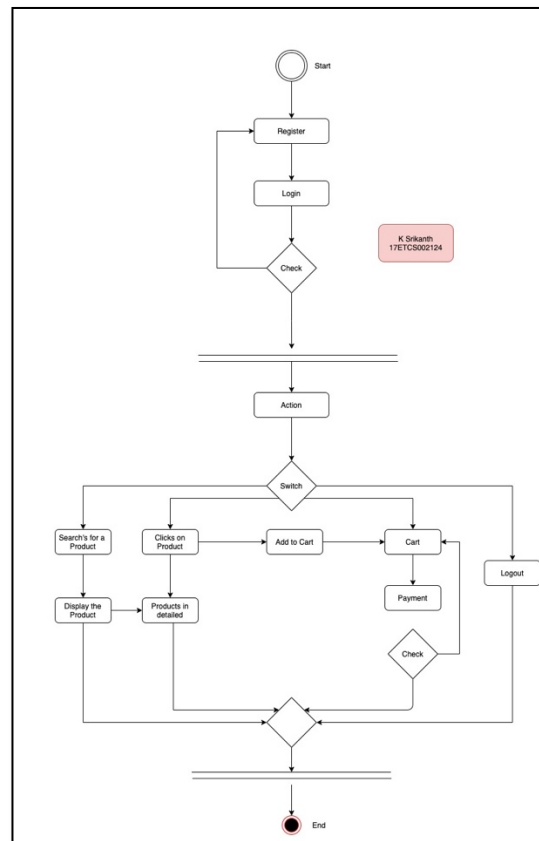


Figure 5 Activity Diagram of the given problem statement (User)

The user has to register by filling up all the necessary details to get started. After registration now user can be to login into the system and the system is going to verify if the user's credentials are valid or not valid then we have a switch case why? cause is no order to use the system

Example: User is logged in and now he wants to logout without even looking at the products.

So, there are 4 cases here,

Case 1: User can logout right after they login into the system

Case 2: User can be able to search for the product and wait for the result to pop up and logout from the system.

Case 3: User can be able to search for the product and wait for the result to pop up then look at the product in detail and logout from the system.

Case 4: User can be able to add products to their carts and make a payment and then after a successful transaction they can logout from the system.

Finally, if the user is done with their shopping, they can logout from the system

Admin interaction

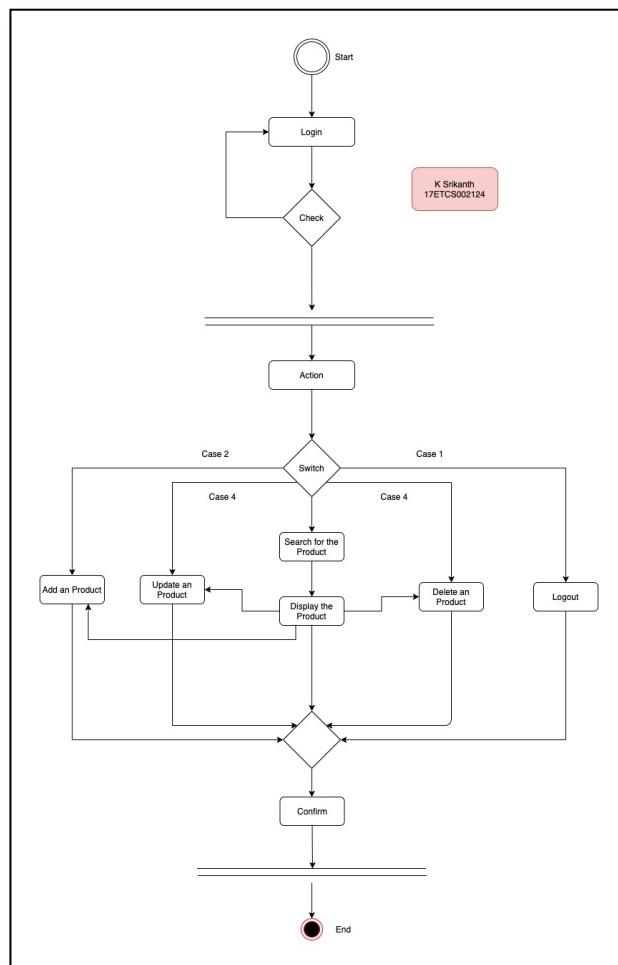


Figure 6 Activity Diagram of the given problem statement (Admin)

The Staff Administration are going to provide the access to staff using admin account which they can login into the system and the system is going to verify if the admin's credentials are valid or not valid then we have 5 switch cases why? cause is no order to use the system.

Example: Admin wants to just add a new product and logout of the system without even performing other actions.

So, there are 5 cases here,

Case 1: Admin can logout right after they login into the system

Case 2: Admin can be able to add new product and logout from the system after they are finished posting it.

Case 3: Admin can be able to update a product which is online and make changes then logout from system after they are finished.

Case 4: Admin can be able to delete a product which is online then logout from system after they are finished

Case 5: User can be able to search for the product and wait for the result to pop up then look at the product in detail and logout from the system.

Finally, if the user is done with their shopping, they can logout from the system

Conclusion

As a part of our application development, we framed functional and non-functional requirements of the system. Then we identified the general use-cases i.e. operations the system is expected to perform. We drew entity-relationship diagram which hints us about how we should design our database or database schema. We illustrated how the system should interact with the users with the help of sequence diagram. Sequence diagram helps us describe the behaviour of the system. And at last we summarized the whole system into a simple activity diagram which gives a brief overview of how the sequence of actions occur and flow of control.

We used different tools of UML to simplify our application design process. These diagrams give a clear picture of how the system should work. And thus The Unified Modelling Language (UML) is a general-purpose, developmental, modelling language in the field of software engineering that is intended to provide a standard way to conceptualize, visualize and understand the design n of the “to be developed system”.