

IBM – NALAIYA THIRAN PROJECT

SMART FASHION RECOMMENDER APPLICATION

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1. INTRODUCTION

1. PROJECT OVERVIEW :

The Fashion industry is one of the larger industries around the world. One of the things that has remained constant throughout human civilization is humans covering their bodies with a piece of cloth. Initially, this cloth was worn as protection from the harsh climates of those ages. Later on, as we humans learned to fend for ourselves from the unforgiving climates, the cloth started to serve a different purpose. Fashion these days showcases the individuality of the person. There are many things that can be said about a person based on their fashion sense.

2. PURPOSE:

There is currently no existing system that is capable of recommending clothes based on the occasion. Different occasions call for different clothing. Moreover, a lot of fashion is based on the color combinations of outfits. A person with no or little fashion sense will have a hard time to decide on clothes that leave a lasting impression. The proposed Fashion Recommendation System is intended to be used by individual users in order to store images of the clothes that they own in what is called a digital wardrobe and also to get recommendations by the system on what clothes to wear for a given occasion. The main aim of the project is to recommend the most appropriate clothes for a given occasion based on the clothes existing in the user's wardrobe to relieve the user of the burden of making decisions about what clothing to wear. Such a system should be capable of helping someone who has no fashion sense to wear clothes that leave a good impression on others. The system should be such that it is easily accessible and easy to take advantage of the various features that it provides. One of the features should be the ability to store images that the user uploads into a wardrobe. A wardrobe is a very useful entity that the user can use to view and manage the images of clothes that they have uploaded. This feature can also be used by the

recommendation algorithm to recommend the clothes. Another feature is the classification of the type and color of the clothing that is uploaded by the user. The system should be capable of handling the 4 basic clothing types: Shirt, T-Shirt, Pants and Shoes.

2. LITERATURE SURVEY

1. EXISTING PROBLEM:

In existing system only simple web application and their rating has been implemented in existing system, An ecommerce product recommendation engine is a piece of technology that displays recommended products to shoppers throughout your store. It uses machine learning to get smarter and show increasingly relevant products to shoppers based on their interests and previous browsing behavior

In existing model is content based filtering scheme has been employed in existing model **The content-based filtering method** analyzes customer data on the likes and dislikes of each user (cookies allow tracking over multiple visits), then makes recommendations based on the browsing history of that user. The idea behind content-based filtering is that if you enjoy a certain item, you'll likely also enjoy a similar item. An example of a contentbased filtering system would be if you were listening to Pandora and consistently 'liked' downtempo jazz music.

The collaborative-filtering method incorporates data from users who have purchased similar products, then combines that information to make decisions about recommendations. The advantage to this filtering method is that it is capable of making complex recommendations on items such as music or movies without having to 'understand' what the item is. This method of filtering operates under the assumption that users will prefer recommendations that are based on purchases they made in the

past. Here's an example: If customer A likes a specific line of products that customer B also likes (assuming they have similar interests), then collaborate-filtering would assume that customer A would like other products that customer B purchased and vice versa.

A hybrid method combines the content-based and collaborative-based methods to incorporate group decisions but focuses the output based on the attributes of a specific visitor. An example of a hybrid filtering system would be how Spotify curates its personalized 'Discover Weekly' playlists. If you've ever listened to a personalized Spotify playlist, it's shocking how accurately they're able to recommend songs based on what you like. The secret behind how they pull this off is through a complex hybrid filtering system that aggregates data on your listening habits as well as similar users' listening habits, to create a playlist of unique songs that align with your personal taste.

2. REFERENCES:

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3. PROBLEM STATEMENT DEFINITION

The personal information collected by recommenders raises the risk of unwanted exposure of that information. Also, malicious users can bias or sabotage the recommendations that are provided to other users. In recent years, the textile and fashion industries have witnessed an enormous amount of growth in fast fashion. On e-commerce platforms, where numerous choices are available, an efficient recommendation system is required to sort, order, and efficiently convey relevant product content or information to users.

1. The problem of the work is to design static web applications deployments with customer deployment
2. Lack of interaction between application and user
3. User need to navigate across multiple pages to choose right product
4. Confusion in choosing product
5. Lack of sales
6. Complex User Interface.
7. Lack of proper guidance.





miro

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
1	Having a lack of data	Overcome those problems	The good recommendation is not taking in progress	More item and user data recommender system has to work with	To get good recommendations
2	Always changing user preferences	Sort out the issue here is that while today I have a particular intension when browsing	It is very challenging to handle those things	Of its user preference	challengable

3. IDEATION & PROPOSED SOLUTION

We have come up with a new innovative solution through which you can directly do your online shopping based on your choice without any search. It can be done by using the chatbot.

In this project you will be working on two modules :

1. Admin and
2. User

ADMIN:

The role of the admin is to check out the database about the stock and have a track of all the things that the users are purchasing.

USER :

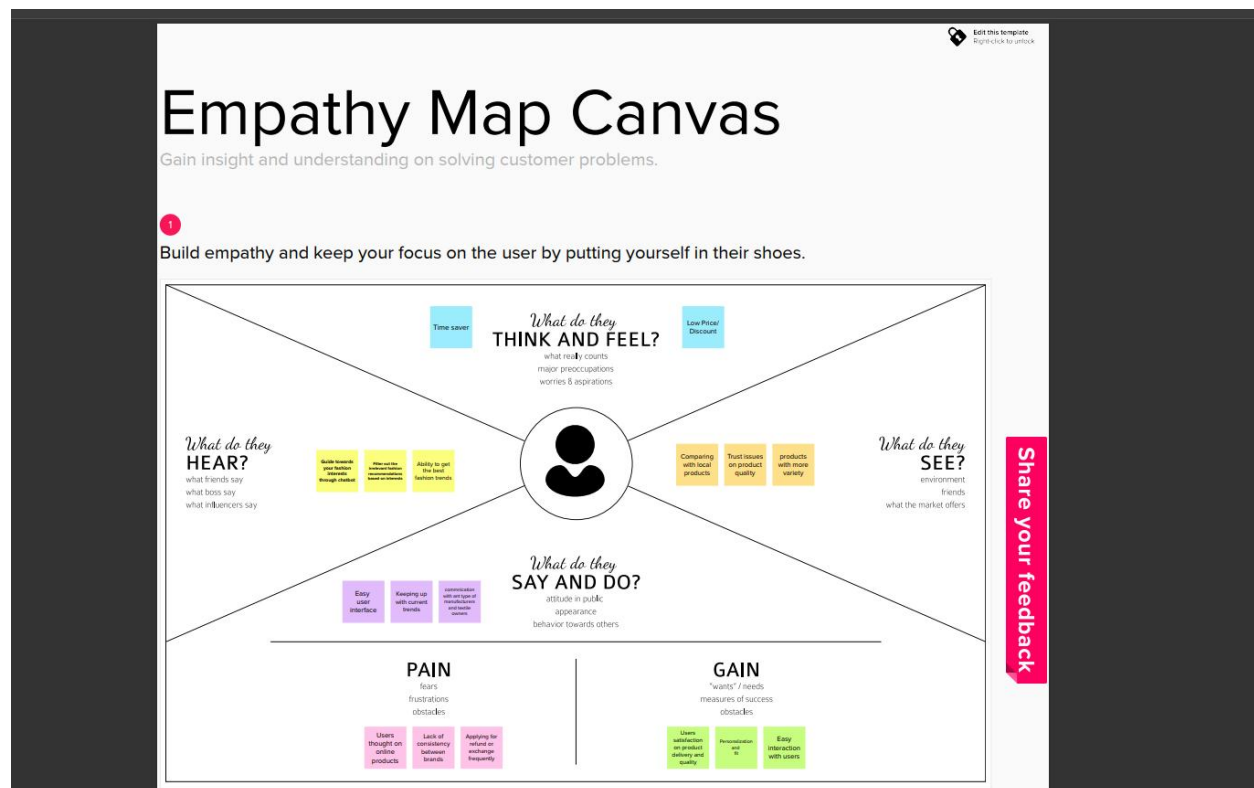
The user will login into the website and go through the products available on the website. Instead of navigating to several screens for booking products online, the user can directly talk to Chatbot regarding the products. Get the recommendations based on information provided by the user.

FEATURES OF CHATBOT :

- i. Using chatbot we can manage user's choices and orders.
- ii. The chatbot can give recommendations to the users based on their interests.
- iii. It can promote the best deals and offers on that day.
- iv. It will store the customer's details and orders in the database.
- v. The chatbot will send a notification to customers if the order is confirmed.
- vi. Chatbots can also help in collecting customer feedback.

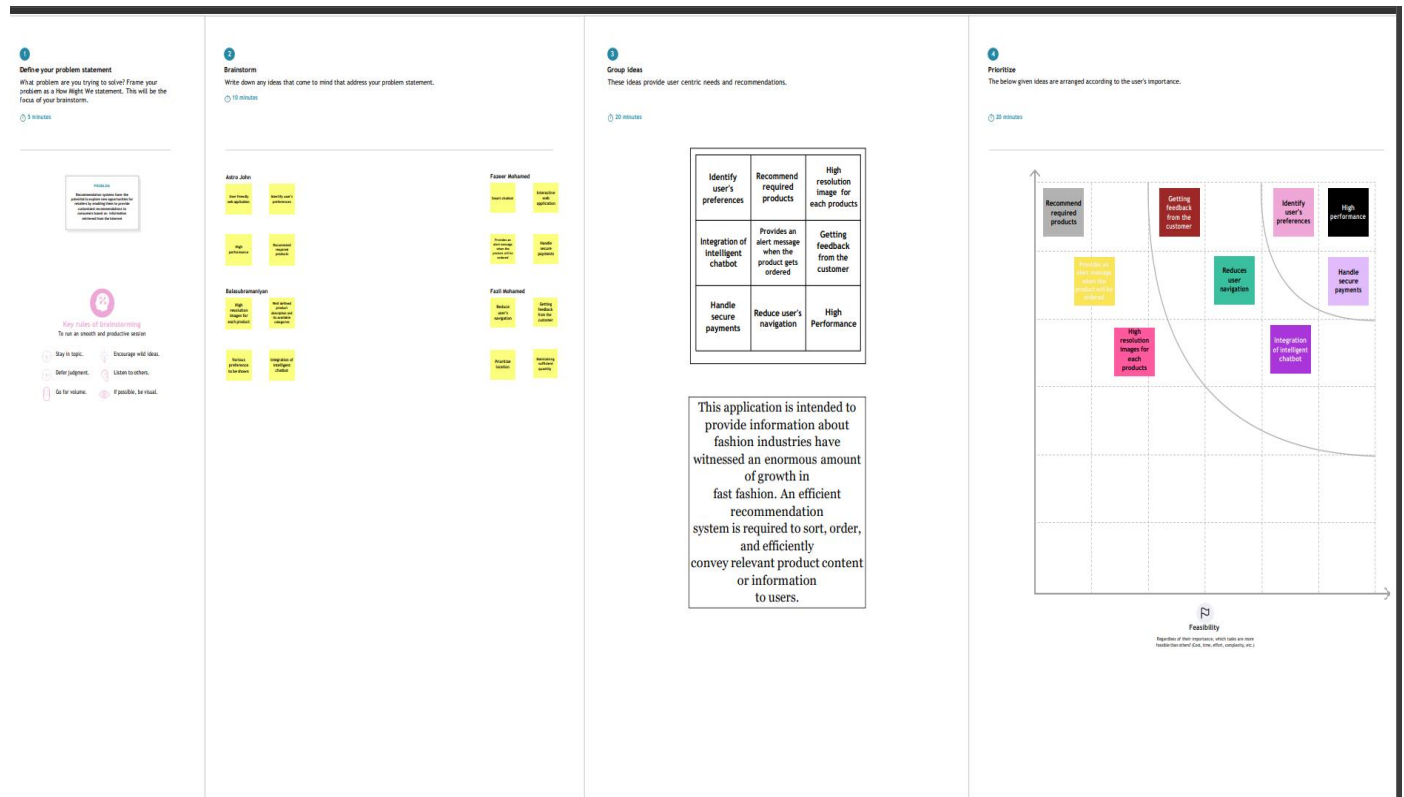
1. EMPATHY MAP CANVAS:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to help teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges. An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers.



2. IDEATION & BRAINSTORMING:

- A group problem-solving technique that involves the spontaneous contribution of ideas from all members of the group.
- The mulling over of ideas by one or more individuals in an attempt to devise or find a solution to a problem.



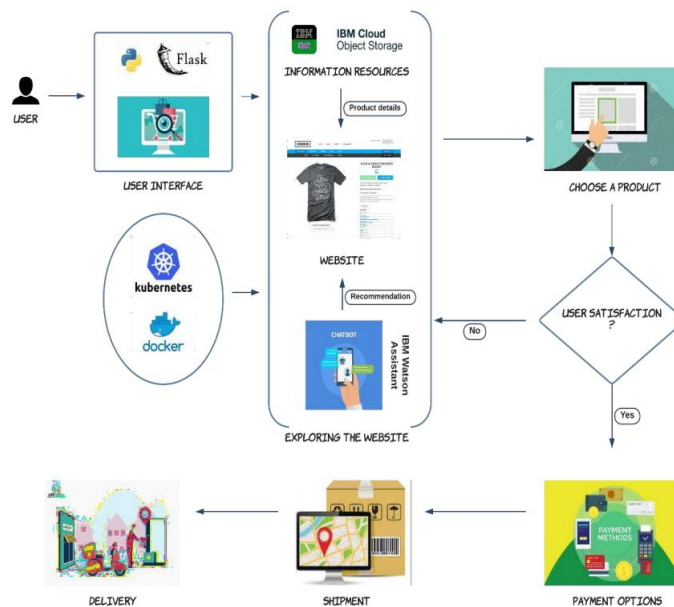
3. PROPOSED SOLUTION:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Rating Prediction, Sequence Prediction, and Ranking Prediction.
2.	Idea / Solution description	It seeks to predict the rating or the preference a user might give to an item.
3.	Novelty / Uniqueness	It " help the users find relevant items ", and the predominant operationalization of this goal has been to focus on the ability to numerically estimate the users' preferences for unseen items or to provide users with item lists ranked in accordance to the estimated.
4.	Social Impact / Customer Satisfaction	customer satisfaction with the recommender system and promote the sustainable development of e-fashion design.
5.	Business Model (Revenue Model)	It is used based on the customer satisfaction model.
6.	Scalability of the Solution	The goal is for collections generated by the model to contain some aspects of the input but with serendipity to pleasantly surprise users.

4. PROBLEM SOLUTION FIT

1. CUSTOMER SEGMENT(S) i) Customer wanting to buy a good quality product in less time. ii) Customer who wants to create a personalized collection.	2. CUSTOMER CONSTRAINTS i) In-store shopping may consume more time, compared to online application. ii) Chatbot service will help the customer to figure out the right products.	3. AVAILABLE SOLUTIONS i) We are going to implement a chatbot, which will be helpful for users to choose their product quickly. ii) 3D model implementation makes better understanding of how the product will suit user.
4. GO-TO-MARKET (PROBLEM) i) Working professionals couldn't spend much time on in-store shopping, hence this application might come in handy. ii) Can choose their product from the comfort of their home.	5. PROBLEM ROOT CAUSE i) This application might be useful for people who couldn't spare their time particularly for shopping. ii) Choosing product anywhere, anytime.	6. BEHAVIOUR i) You can do online shopping from any corner of the world. You only need to install an online shopping app on your android mobile phone, and you can enjoy shopping. ii) They offer great deals like happy hour sales or festive season sales, etc.
7. ENVISION This application allows users to choose product from celebrity collections and imported ones. 8. EMOTIONS BEFORE / AFTER From Traditional wear to Western, all styles would be available for users.	9. YOUR SOLUTION (CHATBOT) Instead of navigating to several screens for booking products online, the user can directly talk to Chatbot regarding the products. 10. MODEL We can visualize ourselves as a 3D model, for the better understanding of how the product suits us.	11. CHANNELS of BEHAVIOUR Huge Selection, Variety of Products, Easy Checkout Process and Fast Delivery Options. 12. CUSTOMER Some customers will go to stores just to be able to spend time with their loved ones.

Architecture Diagram



4.REQUIREMENT ANALYSIS

1. FUNCTIONAL REQUIREMENT:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	<ul style="list-style-type: none">● Registration through Google Form● Registration through Gmail● Registration through Linkedin● Registration through Github
FR-2	User Confirmation	<ul style="list-style-type: none">● Confirmation via Email● Confirmation via OTP● Confirmation via Messages and calls
FR-3	Delivery Confirmation	<ul style="list-style-type: none">● Confirmation via calls, mails and messages
FR-4	Live chat – Chat bot	<ul style="list-style-type: none">● Keeps the databases of the customers information and orders● If the process is completed it will notify through the chat bot
FR-5	Checking Availability	<ul style="list-style-type: none">● It will check the availability of the particular product at the best location
FR-6	Reviews	<ul style="list-style-type: none">● Check for the other customer reviews whether the particular product is good or bad.

2. NON-FUNCTIONAL REQUIREMENTS:

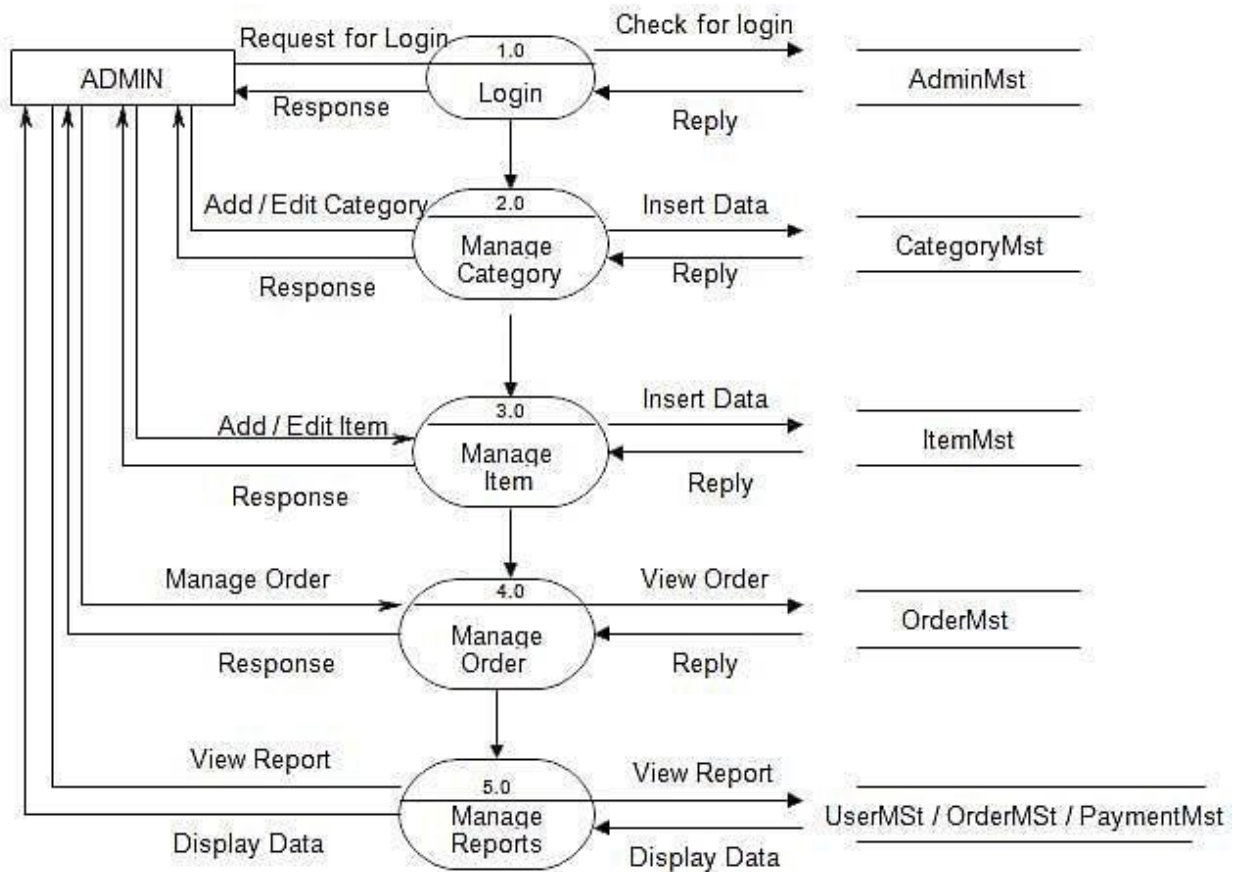
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Pictureafooddeliverystartup. Their product allows people to order food from their smartphones or computers, then receive that food wherever they are
NFR-2	Security	It will collect the users data and information and it will keep it as safe. Data priority is important
NFR-3	Reliability	The probability of a piece of software operating without failure while in a specified environment over a set duration of time.
NFR-4	Performance	The performance of the product will mainly noticed by the customers which is very important to the customers, whether it is worthy to buy or not.
NFR-5	Availability	The Admin should check the availability in database constantly.
NFR-6	Scalability	Handle the problem at demand peaks, avoid downtime.

5.PROJECT DESIGN

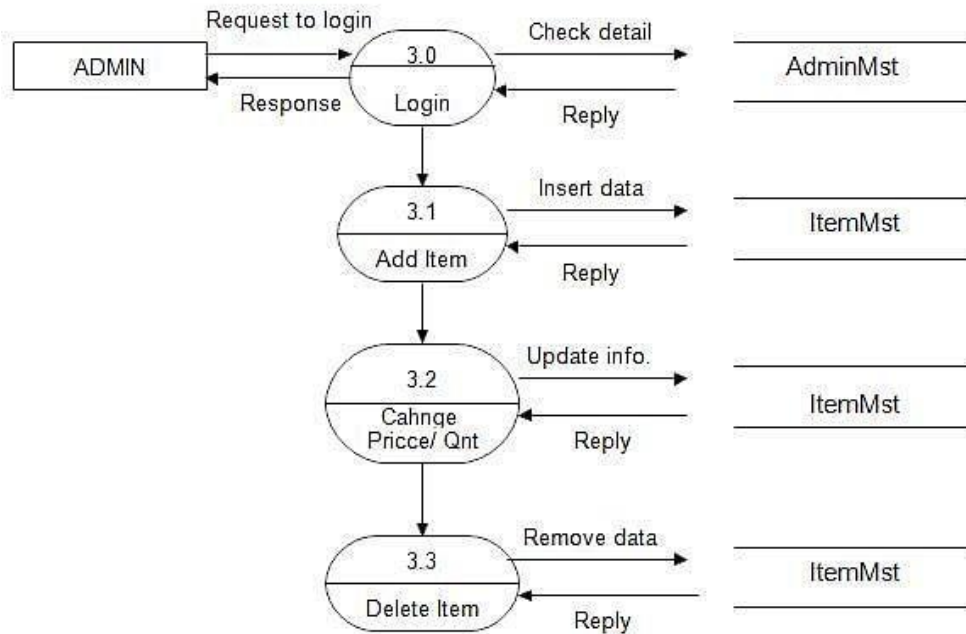
1. DATA FLOW DIAGRAMS:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

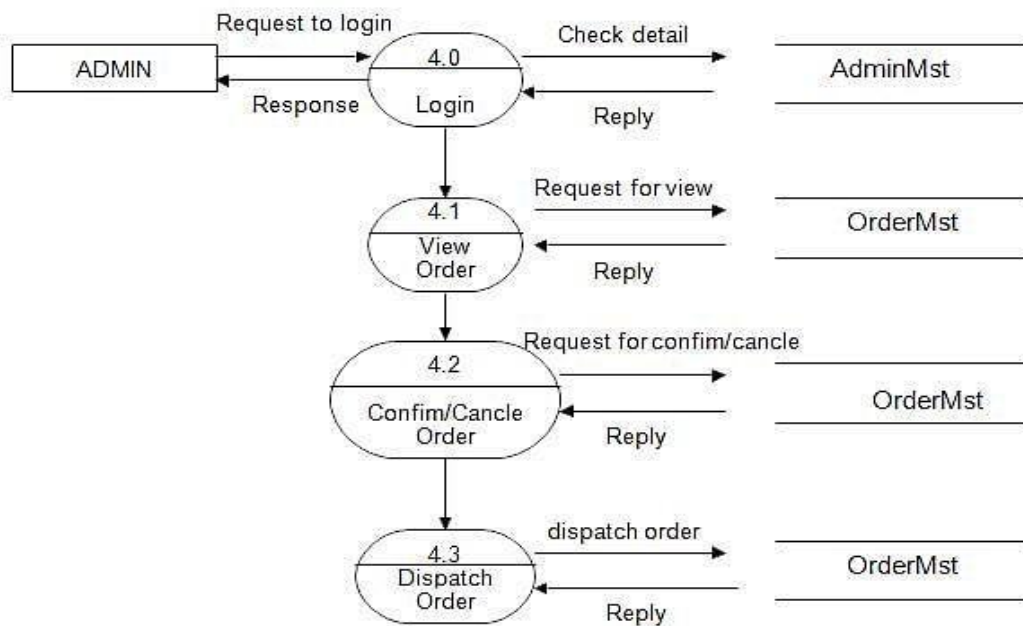
Admin Side DFD - 1st Level



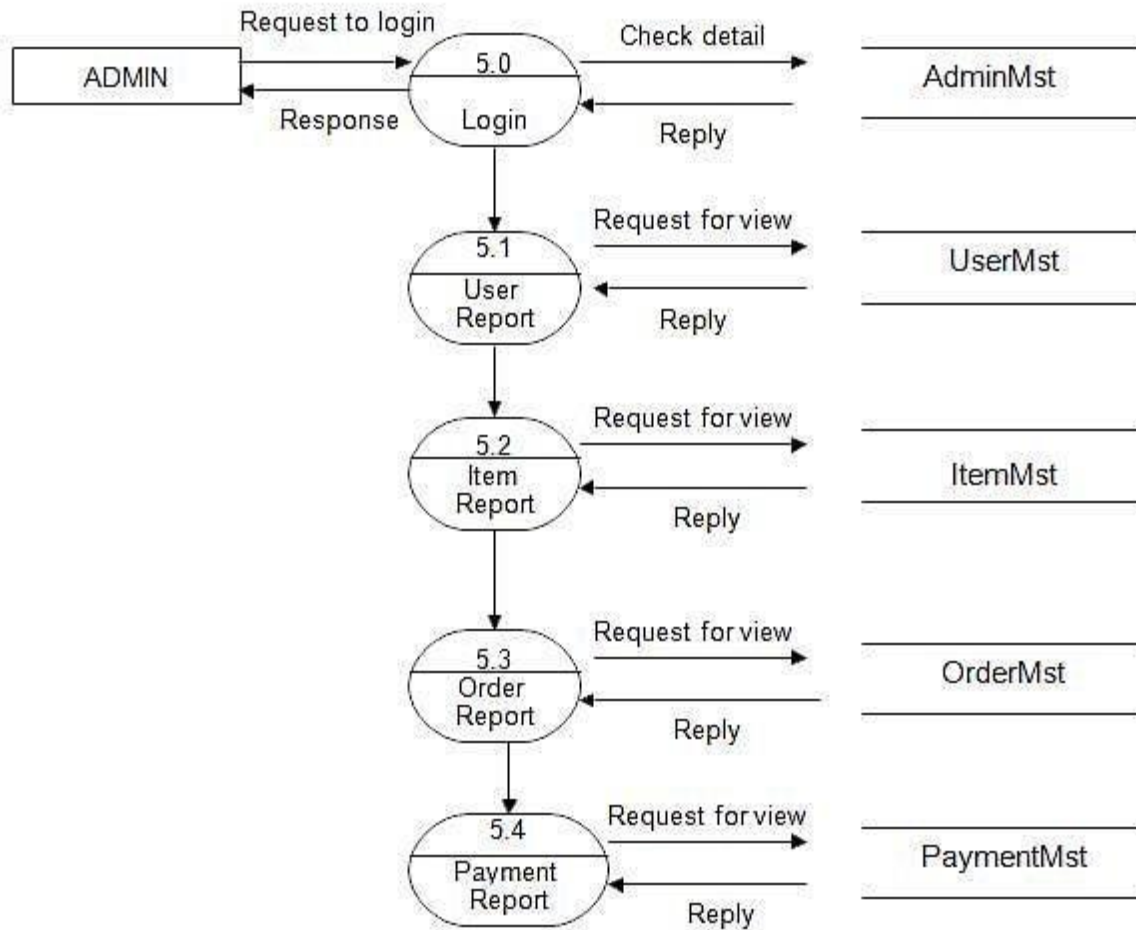
2nd Level Admin DFD - (3.0)



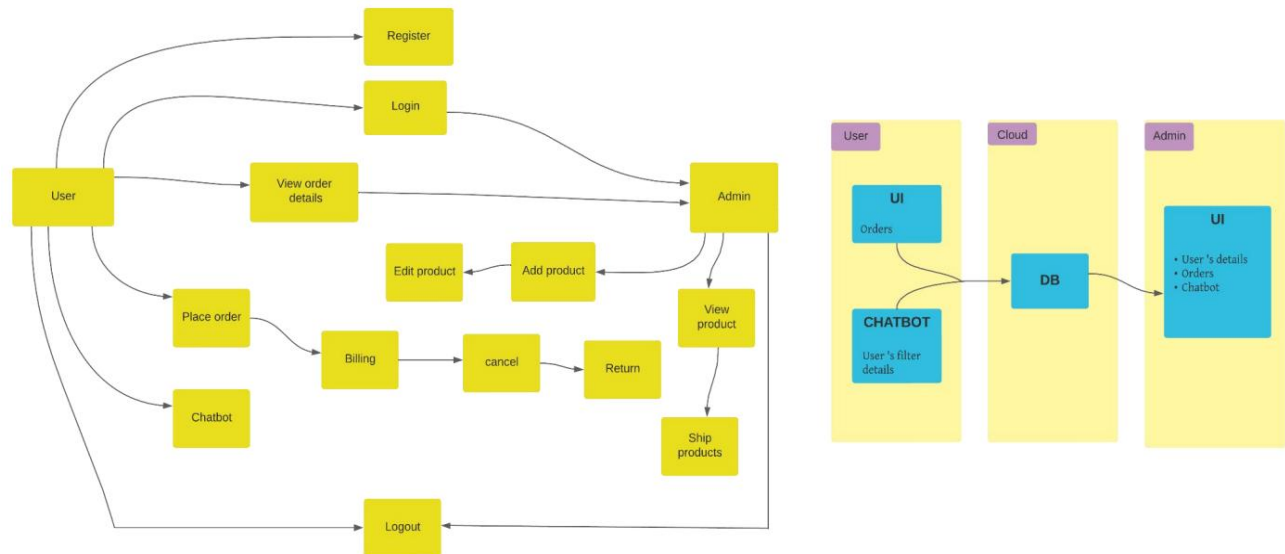
2nd Level Admin DFD - (4.0)



2nd Level Admin DFD - (5.0)



User side Data flow Diagram



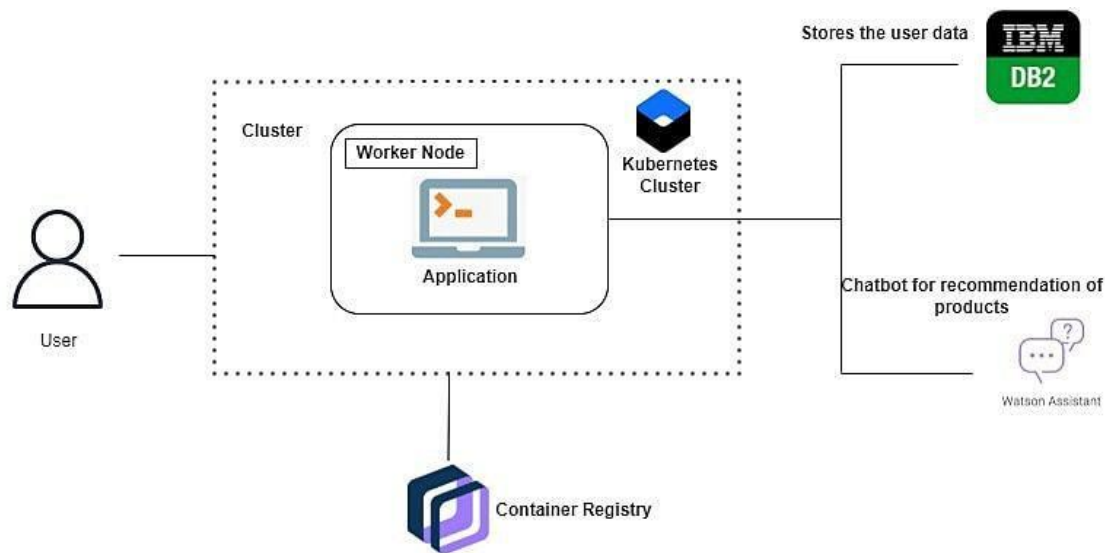
2. SOLUTION & TECHNICAL ARCHITECTURE:

We have developed a new innovative solution through which you can directly do your online shopping based on your choice without any search. It can be done by using the chatbot. In this project you will be working on two modules:

1. Admin
2. User

Instead of searching for products in the search bar and navigating to individual products to find required preferences, this project leverages the use of chatbots to gather all required preferences and recommend products to the user. The solution is implemented in such a way as to improve the interactivity between customers and

applications. The chatbot sends messages periodically to notify offers and preferences. For security concerns, this application uses a token to authenticate and authorize users securely. The token has encoded user id and role. Based on the encoded information, access to the resources is restricted to specific users.



Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	The Customer/ user interacts with the application through chatbot.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	The Customer will register and login to the website.	Javascript
3.	Application Logic-2	The Customer can sign In via Google, LinkedIn, Facebook etc.	Javascript

4.	Cloud Database	The User data and products data will be stored in IBM cloud storage.	IBM DB2, IBM Cloudant etc.
5.	File Storage	The product details like price, quantity, and other details etc will be available in cloud bucket.	IBM Block Storage or Other Storage Service or Local Filesystem
6.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud	Local, Cloud Foundry, Kubernetes, etc.

3. USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can login by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the particular menu	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can view the menus through Facebook and other social media platforms	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access and place my order.	High	Sprint-1
	Dashboard	USN-1	I can see the dashboard with reviews, ratings, menus etc...			

Customer (Web user)	Registration	USN-1	As a user ,I can sign up for the dishes which was ordered as by putting in my password, email, and confirming.	I can access my account .	High	
		USN-2	As a user, an email confirmation will be sent to me once I've submitted my information.	I can get a confirmation email and confirm it.	High	
Customer Care Executive		USN-1	As a customer executive, I can fix the application's login problem and other problems.	I am available 24/7 to offer support or alternative solutions.	Medium	
Administrator		USN-1	As an administrator, I can update or enhance the users menus and their order queries	I can authorise transactions and products.	Medium	

6. PROJECT PLANNING & SCHEDULE

1. SPRINT PLANNING & ESTIMATION:

MILESTONES	ACTIVITY	DESCRIPTION
Project development phase	Delivery of Sprint-1,2, 3, 4	To develop the code and submit the develop the code after completion of testing
Setting-up app environment	Create IBM cloud account	Sign up IBM cloud account
	Create flask project	Getting started with the flask to create project
	Install IBM cloud cli	Install IBM command line interface (CLI)
	Docker CLI installation	Installing docker CLI
	Create an account in sendgrid	Create an account in sendgrid Use service as e-mail integration to the application for sending emails

Implementing web application	Create UI to interact with the application	Create UI <ol style="list-style-type: none"> 1. registration page 2. login page 3. view products page 4. add products page
	Create IBM DB2 and connect with the Python	Create IBM DB2 in IBM cloud and link with the Python
Integrating sendgrid service	Sendgrid integration with the Python	To send emails from the application we need to integrate the sendgrid services
Developing a chat bot	Building a chat bot and integrate with the application	Build the chat bot and integrate it to the flask application
Deployment of app in IBM cloud	Containerise the app	Create a docker image of the application in addition to push it to the IBM container registry
	Upload image to IBM container registry	Upload the image to IBM container registry
	Deploy in in kubernetes cluster	Once the image is uploaded to IBM container registry deploy the image toward IBM kubernetes cluster

Ideation phase	Literature survey	Literature survey on the selected project and information gathering
	Empathy map	Prepare empathy map to capture the user pains and gains, prepare a list of problem statement
	Ideation	Organising the brainstorming session and prioritise the top three ideas based on feasibility and importance

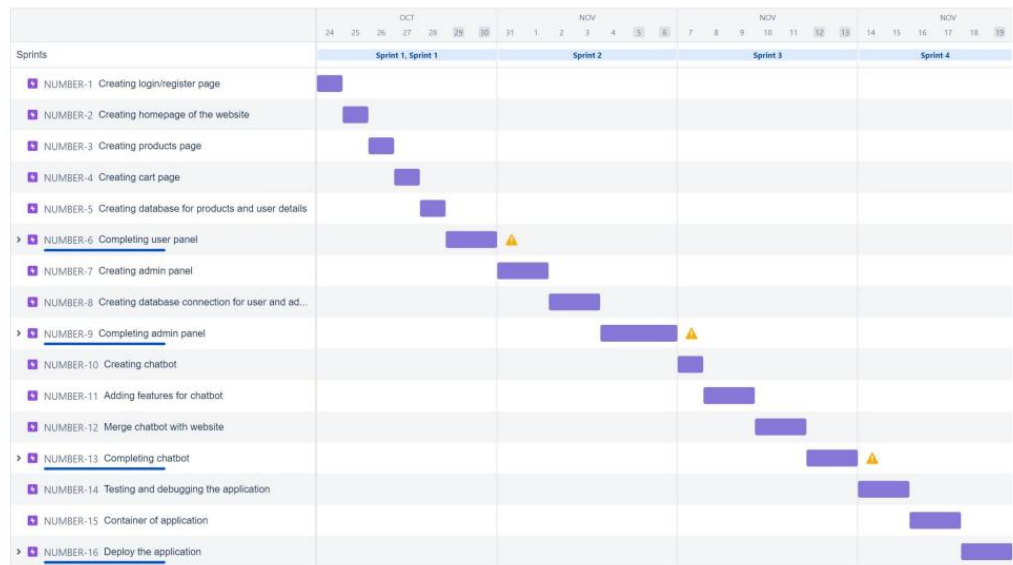
Project design phase 1	Proposed solution	Prepare proposed solution document which includes novelty, feasibility of ideas, business model, social impact, scalability of solution
	Problem solution fit	Prepare problem solution fit documents
	Solution architecture	Prepare solution architecture document
Project design phase 2	Customer journey map	Prepare customer journey map to understand the user interactions and experience with the application
	Functional requirements	Prepare functional and non- functional necessity document
	Data flow diagram	Prepare data flow diagram and user stories
	Technology architecture	Draw technology architecture diagram
Project planning phase	Milestones and activity list	Prepare milestones and activity list of the project
	Sprint delivery plan	Prepare spring delivery plan

2. SPRINT DELIVERY SCHEDULE:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	11 Nov 2022	20	11 Nov 2022
Sprint-3	20	6 Days	05 Nov 2022	11 Nov 2022	20	11 Nov 2022
Sprint-4	20	6 Days	07 Nov 2022	11 Nov 2022	20	11 Nov 2022

3. REPORTS FROM JIRA:

Burndown Chart:



7. CODING & SOLUTIONING

1. FEATURE-1:

Login.html:

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>U NiK</title>
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
  <link rel="stylesheet" href="https://unik.s3.jp-tok.cloud-object-
storage.appdomain.cloud/style.css">
</head>

<body>

  <section id="header">
    <a href="#"></a>

    <div>
      <ul id="navbar">
        <li><a class="active" href="index.html">Home</a></li>
        <li><a href="products.html">Products</a></li>
        <li><a href="blog.html">Blog</a></li>
        <li><a href="about.html">About</a></li>
        <li><a href="contact.html">Contact</a></li>
        <li><a href="cart.html"><i class="fa fa-shopping-bag"></i></a></li>
        <li><a href="cart.html"><i class="fa fa-user-secret"></i></a></li>
      </ul>
    </div>
  </section>

  <section id="login">

    <form>
      <div class="imgcontainer">
        <h2>User Login</h2>
        
      </div>
```

```

<div class="container">
  <label for="mailid"><b>E-Mail</b></label>
  <input type="text" placeholder="Enter your E-Mail" name="email" required>

  <label for="psw"><b>Password</b></label>
  <input type="password" placeholder="Enter Password" name="psw" required>

  <button type="submit">Login</button>
  <label>
    <input type="checkbox" checked="checked" name="remember"> Remember me
  </label>
</div>

<div class="container signin">
  <p>Forget Password <a href="#"> Click here </a>.</p>
</div>
</form>
</section>

```

```

<footer class="section-p1">
  <div class="col">
    
    <h4>Contact</h4>
    <p><strong>E-Mail: </strong>uniksmartfashion@gmail.com</p>
    <p><strong>Phone: </strong>0000000000</p>
    <div class="follow">
      <h4>Follow us</h4>
      <div class="icon">
        <i class="fa fa-facebook-f"></i>
        <i class="fa fa-twitter"></i>
        <i class="fa fa-instagram"></i>
        <i class="fa fa-pinterest-p"></i>
        <i class="fa fa-youtube"></i>
      </div>
    </div>
  </div>
</div>

```

```

<div class="col">
  <h4>About</h4>
  <a href="#">About us</a>
  <a href="#">Delivery Information</a>

```

```
<a href="#">Privacy Policy</a>
<a href="#">Terms & Conditions</a>
<a href="#">Contact us</a>
</div>
```

```
<div class="col">
  <h4>My Account</h4>
  <a href="#">Sign In</a>
  <a href="#">View Cart</a>
  <a href="#">My Wishlist</a>
  <a href="#">Track my order</a>
  <a href="#">Help</a>
</div>
```

```
</footer>
<div class="copyright">
  <center><p> C 2022, PNT2022TMID23050 - Smart Fashion Recommender Application
</p></center>
</div>
<script src="script.js"></script>
</body>
</html>
```

[Index.html:](#)

```
<!DOCTYPE html>
<html lang="en">
```

```
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>U NiK</title>
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
  <link rel="stylesheet" href="https://unik.s3.jp-tok.cloud-object-
storage.appdomain.cloud/style.css">
</head>
```

```
<body>
```

```
  <section id="header">
    <a href="#"></a>
```

```

<div>
  <ul id="navbar">
    <li><a class="active" href="index.html">Home</a></li>
    <li><a href="products.html">Products</a></li>
    <li><a href="blog.html">Blog</a></li>
    <li><a href="about.html">About</a></li>
    <li><a href="contact.html">Contact</a></li>
    <li><a href="cart.html"><i class="fa fa-shopping-bag"></i></a></li>
    <li><a href="register.html"><i class="fa fa-user-secret"></i></a></li>
  </ul>
</section>

<section id="hero">
  <h4>Trade-in-offer</h4>
  <h2>Smart Fashion Recommender</h2>
  <h1>Application</h1>
  <p>Chat with FIND to get personalized products</p>
  <button class="normal">Shop now</button>
</section>

<section id="feature" class="section-p1">
  <div class="fe-box">
    
    <h6>Free Shipping</h6>
  </div>
  <div class="fe-box">
    
    <h6>Online Order</h6>
  </div>
  <div class="fe-box">
    
    <h6>Save Money</h6>
  </div>
  <div class="fe-box">
    
    <h6>Promotions</h6>
  </div>
  <div class="fe-box">
    

```

```
        <h6>Happy Sell</h6>
    </div>
    <div class="fe-box">
        
        <h6>F24/7 Support</h6>
    </div>
</section>
```

```
<section id="product1" class="section-p1">
    <h2>Featured Product</h2>
    <p>New Collections New Modern Designs</p>
    <div class="pro-container">
        <div class="pro">
            
            <div class="des">
                <span>adidas</span>
                <h5>Blue n Brown T-Shirts</h5>
                <div class="star">
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                </div>
                <h4>₹1500</h4>
            </div>
            <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
        </div>
        <div class="pro">
            
            <div class="des">
                <span>adidas</span>
                <h5>Blue strip T-Shirts</h5>
                <div class="star">
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                    <i class="fa fa-star"></i>
                </div>
                <h4>₹1570</h4>
            </div>
        </div>
    </div>
</section>
```

```

        </div>
        <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
    </div>
    <div class="pro">
        
        <div class="des">
            <span>adidas</span>
            <h5>Plain T-Shirts</h5>
            <div class="star">
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
            </div>
            <h4>₹1400</h4>
        </div>
        <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
    </div>
    <div class="pro">
        
        <div class="des">
            <span>adidas</span>
            <h5>Checked T-Shirts</h5>
            <div class="star">
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
                <i class="fa fa-star"></i>
            </div>
            <h4>₹2000</h4>
        </div>
        <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
    </div>
    <div class="pro">
        
        <div class="des">
            <span>Banarasi</span>
            <h5>Georgette Bandhani Rama Blue & Olive Green Saree</h5>
            <div class="star">

```



```

        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
    </div>
    <h4>₹10,000</h4>
</div>
<a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>Banarasi</span>
        <h5>Banarasi Silk Jaal Dark Maroon Saree</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹9000</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>Banarasi</span>
        <h5>Banarasi Silk Buttis Yellow Saree</h5><br>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹8000</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
```

```

<div class="pro">
  
  <div class="des">
    <span>Banarasi</span>
    <h5>Banarasi Silk Jaal Purple Saree</h5><br>
    <div class="star">
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
    </div>
    <h4>₹6000</h4>
  </div>
  <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
</div>
</section>

```

```

<section id="banner" class="section-m1">
  <h4>Repair Services</h4>
  <h2>Up to <span>70% off</span> All t-Shirts & Accessories</h2>
  <a href="products.html"><button class="normal">Explore More</button></a>
</section>

```

```

<section id="product1" class="section-p1">
  <h2>New Arrivals</h2>
  <p>Branded shoe's and T-shirts </p>
  <div class="pro-container">
    <div class="pro">
      
      <div class="des">
        <span>adidas</span>
        <h5>Blue Shoe</h5>
        <div class="star">
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
        </div>
        <h4>₹6000</h4>

```

```

    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Brown leather shoe</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹8000</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Sandle High Heel</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹6600</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Brown High Heel</h5>
        <div class="star">

```

```
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
        <i class="fa fa-star"></i>
    </div>
    <h4>₹7800</h4>
</div>
<a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Black Smile T-Shirts</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹900</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Pink dog T-Shirts</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹900</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
```

```

<div class="pro">
  
  <div class="des">
    <span>adidas</span>
    <h5>Black and White Trendy Shirt</h5>
    <div class="star">
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
    </div>
    <h4>₹1500</h4>
  </div>
  <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
  
  <div class="des">
    <span>adidas</span>
    <h5>Green Panda Shirt</h5>
    <div class="star">
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
    </div>
    <h4>₹600</h4>
  </div>
  <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
</div>
</section>

<section id="sm-banner" class="section-p1">
  <div class="banner-box">
    <h4>Crazy Deals</h4>
    <h2>Buy 1 get 1 free</h2>
    <span>The best classic dress is on sale at U Nik</span>
    <a href="products.html"><button class="white">Learn More </button></a>
  </div>

```

```
<div class="banner-box banner-box2">
  <h4>spring/summer</h4>
  <h2>upcommig seasons</h2>
  <span>The best classic dress is on sale at U Nik</span>
  <a href="blog.html"><button class="white">Collection</button></a>
</div >
</section>
```

```
<section id="banner3">
  <div class="banner-box">
    <h2>SEASONAL SALE</h2>
    <h3>Winter collection 50% off</h3>
  </div >
  <div class="banner-box banner-box2">
    <h2>SEASONAL SALE</h2>
    <h3>Winter collection 50% off</h3>
  </div >
  <div class="banner-box banner-box3">
    <h2>SEASONAL SALE</h2>
    <h3>Winter collection 50% off</h3>
  </div >
</section>
```

```
<footer class="section-p1">
  <div class="col">
    
    <h4>Contact</h4>
    <p><strong>E-Mail: </strong>uniksmartfashion@gmail.com</p>
    <p><strong>Phone: </strong>0000000000</p>
    <div class="follow">
      <h4>Follow us</h4>
      <div class="icon">
        <i class="fa fa-facebook-f"></i>
        <i class="fa fa-twitter"></i>
        <i class="fa fa-instagram"></i>
        <i class="fa fa-pinterest-p"></i>
        <i class="fa fa-youtube"></i>
      </div>
    </div>
  </div>
</div>

<div class="col">
  <h4>About</h4>
```

```
<a href="#">About us</a>
<a href="#">Delivery Information</a>
<a href="#">Privacy Policy</a>
<a href="#">Terms & Conditions</a>
<a href="#">Contact us</a>
</div>
```

```
<div class="col">
  <h4>My Account</h4>
  <a href="#">Sign In</a>
  <a href="#">View Cart</a>
  <a href="#">My Wishlist</a>
  <a href="#">Track my order</a>
  <a href="#">Help</a>
</div>
```

```
</footer>
<div class="copyright">
  <center><p>PRODUCT MANAGEMENT SYSTEM</p></center>
</div>
```

```
<script src="script.js"></script>
```

```
</body>
```

```
</html>
```

2. FEATURE 2:

Products.html:

```
<!DOCTYPE html>
<html lang="en">
```

```
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>U NiK</title>
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
  <link rel="stylesheet" href="https://unik.s3.jp-tok.cloud-object-
storage.appdomain.cloud/style.css">
</head>
```

```

<body>

<section id="header">
  <a href="#"></a>

  <div>
    <ul id="navbar">
      <li><a href="index.html">Home</a></li>
      <li><a class="active" href="products.html">Products</a></li>
      <li><a href="blog.html">Blog</a></li>
      <li><a href="about.html">About</a></li>
      <li><a href="contact.html">Contact</a></li>
      <li><a href="cart.html"><i class="fa fa-shopping-bag"></i></a></li>
      <li><a href="cart.html"><i class="fa fa-user-secret"></i></a></li>
    </ul>
  </section>

<section id="page-header">
  <h2>Stay Home</h2>
  <p>Save more with coupons & up to 70% off</p>
</section>

<section id="product1" class="section-p1">

  <div class="pro-container">
    <div class="pro" onclick="window.location.href='sproduct.html'">
      
      <div class="des">
        <span>Lavie</span>
        <h5>Women's Black Handbag with Clutches</h5>
        <div class="star">
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
          <i class="fa fa-star"></i>
        </div>
        <h4>₹3500</h4>
      </div>
      <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
    </div>
  <div class="pro">

```


<div class="des">

Lavie

<h5>Women's pink Handbag</h5>

<div class="star">

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

</div>

<h4>₹1500</h4>

</div>

<i class="fa fa-shopping-bag bag"></i>

</div>

<div class="pro">

<div class="des">

Lavie

<h5>Women's Green Handbag</h5>

<div class="star">

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

</div>

<h4>₹1800</h4>

</div>

<i class="fa fa-shopping-bag bag"></i>

</div>

<div class="pro">

<div class="des">

Lavie

<h5>Women's Brown Handbag</h5>

<div class="star">

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

<i class="fa fa-star"></i>

```

        <i class="fa fa-star"></i>
    </div>
    <h4>₹1590</h4>
</div>
<a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>Graff</span>
        <h5>Silver plated Women's Necklace</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹1500</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>Graff</span>
        <h5>Silver plated Women's Stud</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹600</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">

```

```

<span>Graff</span>
<h5>Silver plated Women's Ring</h5>
<div class="star">
  <i class="fa fa-star"></i>
  <i class="fa fa-star"></i>
  <i class="fa fa-star"></i>
  <i class="fa fa-star"></i>
  <i class="fa fa-star"></i>
</div>
<h4>₹500</h4>
</div>
<a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
  
  <div class="des">
    <span>Graff</span>
    <h5>Silver plated Women's Bangle</h5>
    <div class="star">
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
    </div>
    <h4>₹2500</h4>
  </div>
  <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>

<div class="pro">

<div class="des">
  <span>H&M</span>
  <h5>Boys Yellow Solid Top And Pant Set</h5><br>
  <div class="star">
    <i class="fa fa-star"></i>
    <i class="fa fa-star"></i>
    <i class="fa fa-star"></i>
    <i class="fa fa-star"></i>
    <i class="fa fa-star"></i>
  </div>

```

```

        <h4>₹500</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>H&M</span>
        <h5>Boys Navy Polka Dot Print Shirt And Pant Set With Bow</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹1000</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>H&M</span>
        <h5>Boys Red Solid Top And Pant Set</h5><br>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹700</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>H&M</span>
        <h5>Unisex Brown Bow Applique Sweatshirt and Pant Set</h5>

```

```

        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹1500</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Black Sports Shoe</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹7500</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
    
    <div class="des">
        <span>adidas</span>
        <h5>Leather Shoe-Brown</h5>
        <div class="star">
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
            <i class="fa fa-star"></i>
        </div>
        <h4>₹9800</h4>
    </div>
    <a href="#"><i class="fa fa-shopping-bag bag"></i></a>

```

```

</div>
<div class="pro">
  
  <div class="des">
    <span>adidas</span>
    <h5>White Sports Shoe</h5>
    <div class="star">
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
    </div>
    <h4>₹5500</h4>
  </div>
  <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
<div class="pro">
  
  <div class="des">
    <span>adidas</span>
    <h5>Red Designer Sports Shoe</h5>
    <div class="star">
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
      <i class="fa fa-star"></i>
    </div>
    <h4>₹11500</h4>
  </div>
  <a href="#"><i class="fa fa-shopping-bag bag"></i></a>
</div>
</div>
</section>

```

```

<section id="pagination" class="section-p1">
  <a href="#">1</a>
  <a href="product1.html">2</a>
  <a href="product2.html">3</a>
  <a href="#"><i class="fa fa-arrow-right"></i></a>
</section>

```

```
<section id="newsletter" class="section-p1">
  <div class="newstext">
    <h4>Sign up for NewsLetters</h4>
    <p>Get Email updates about our latest shop and <span>special offer</span>
    </p>
  </div>
  <div class="form">
    <input type="text" placeholder="Your E-mail Address">
    <button class="normal">Sign Up</button>
  </div>
</section>
```

```
<footer class="section-p1">
  <div class="col">
    
    <h4>Contact</h4>
    <p><strong>E-Mail: </strong>uniksmartfashion@gmail.com</p>
    <p><strong>Phone: </strong>0000000000</p>
    <div class="follow">
      <h4>Follow us</h4>
      <div class="icon">
        <i class="fa fa-facebook-f"></i>
        <i class="fa fa-twitter"></i>
        <i class="fa fa-instagram"></i>
        <i class="fa fa-pinterest-p"></i>
        <i class="fa fa-youtube"></i>
      </div>
    </div>
  </div>
</div>
```

```
<div class="col">
  <h4>About</h4>
  <a href="#">About us</a>
  <a href="#">Delivery Information</a>
  <a href="#">Privacy Policy</a>
  <a href="#">Terms & Conditions</a>
  <a href="#">Contact us</a>
</div>
```

```
<div class="col">
  <h4>My Account</h4>
  <a href="#">Sign In</a>
```

```

        <a href="#">View Cart</a>
        <a href="#">My Wishlist</a>
        <a href="#">Track my order</a>
        <a href="#">Help</a>
    </div>

</footer>
    <div class="copyright">
        <center><p> C 2022, PNT2022TMID23050 - Smart Fashion Recommender Application
    </p></center>
    </div>

    <script src="script.js"></script>

</body>

</html>

```

register.html:

```

<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>U NiK</title>
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
    <link rel="stylesheet" href="https://unik.s3.jp-tok.cloud-object-
storage.appdomain.cloud/style.css">
</head>

<body>

    <section id="header">
        <a href="#"></a>

    <div>
        <ul id="navbar">

```



```

    <li><a class="active" href="index.html">Home</a></li>
    <li><a href="products.html">Products</a></li>
    <li><a href="blog.html">Blog</a></li>
    <li><a href="about.html">About</a></li>
    <li><a href="contact.html">Contact</a></li>
    <li><a href="cart.html"><i class="fa fa-shopping-bag"></i></a></li>
    <li><a href="cart.html"><i class="fa fa-user-secret"></i></a></li>
  </ul>
</section>

```

```

<section id="register">
  <form>
    <div class="container">
      <h1>Register</h1>
      <p>Please fill in this form to create an account.</p>
      <hr>

      <label for="name"><b>Name</b></label>
      <input type="text" placeholder="Enter Name" name="name" id="name" required>

      <label for="phn"><b>Phone Number</b></label>
      <input type="text" placeholder="Enter Phone no" name="phn" id="phn" required>

      <label for="email"><b>Email</b></label>
      <input type="text" placeholder="Enter Email" name="email" id="email" required>

      <label for="psw"><b>Password</b></label>
      <input type="password" placeholder="Enter Password" name="psw" id="psw" required>

      <button type="submit" class="registerbtn">Register</button>
    </div>

    <div class="container signin">
      <p>Already have an account? <a href="login.html">Sign in</a>.</p>
    </div>
  </form>
</section>

```

```

<footer class="section-p1">
  <div class="col">
    
    <h4>Contact</h4>
  </div>

```

```

<p><strong>E-Mail: </strong>uniksmartfashion@gmail.com</p>
<p><strong>Phone: </strong>0000000000</p>
<div class="follow">
  <h4>Follow us</h4>
  <div class="icon">
    <i class="fa fa-facebook-f"></i>
    <i class="fa fa-twitter"></i>
    <i class="fa fa-instagram"></i>
    <i class="fa fa-pinterest-p"></i>
    <i class="fa fa-youtube"></i>
  </div>
</div>
</div>

<div class="col">
  <h4>About</h4>
  <a href="#">About us</a>
  <a href="#">Delivery Information</a>
  <a href="#">Privacy Policy</a>
  <a href="#">Terms & Conditions</a>
  <a href="#">Contact us</a>
</div>

<div class="col">
  <h4>My Account</h4>
  <a href="#">Sign In</a>
  <a href="#">View Cart</a>
  <a href="#">My Wishlist</a>
  <a href="#">Track my order</a>
  <a href="#">Help</a>
</div>
</footer>
<div class="copyright">
  <center><p> C 2022, PNT2022TMID23050 - Smart Fashion Recommender Application
</p></center>
</div>
<script src="script.js"></script>
</body>
</html>

```

8. TESTING

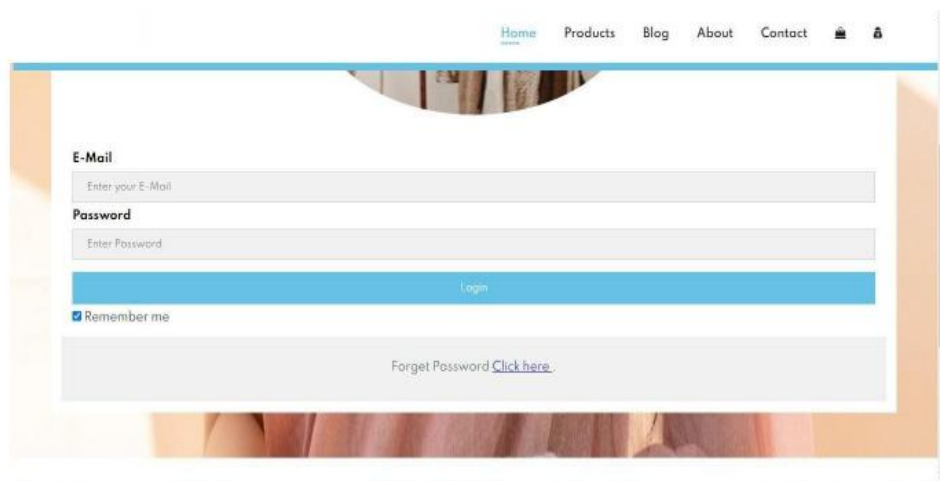
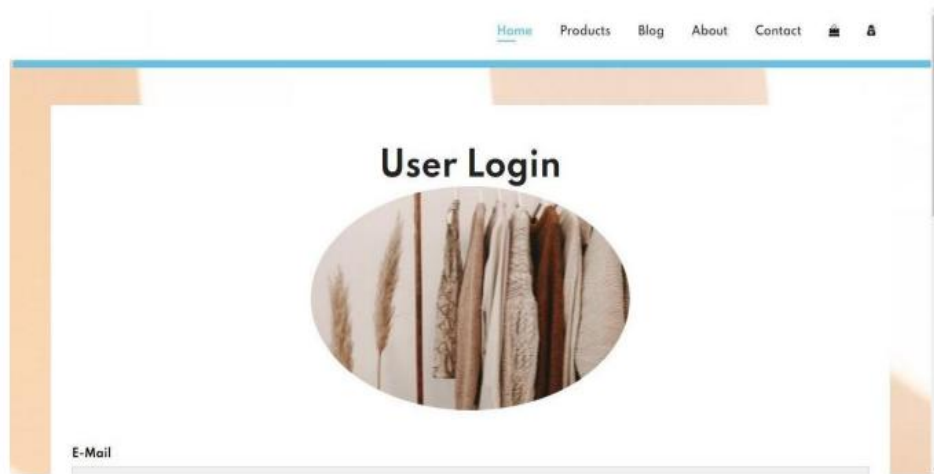
TEST CASES:

Home page:

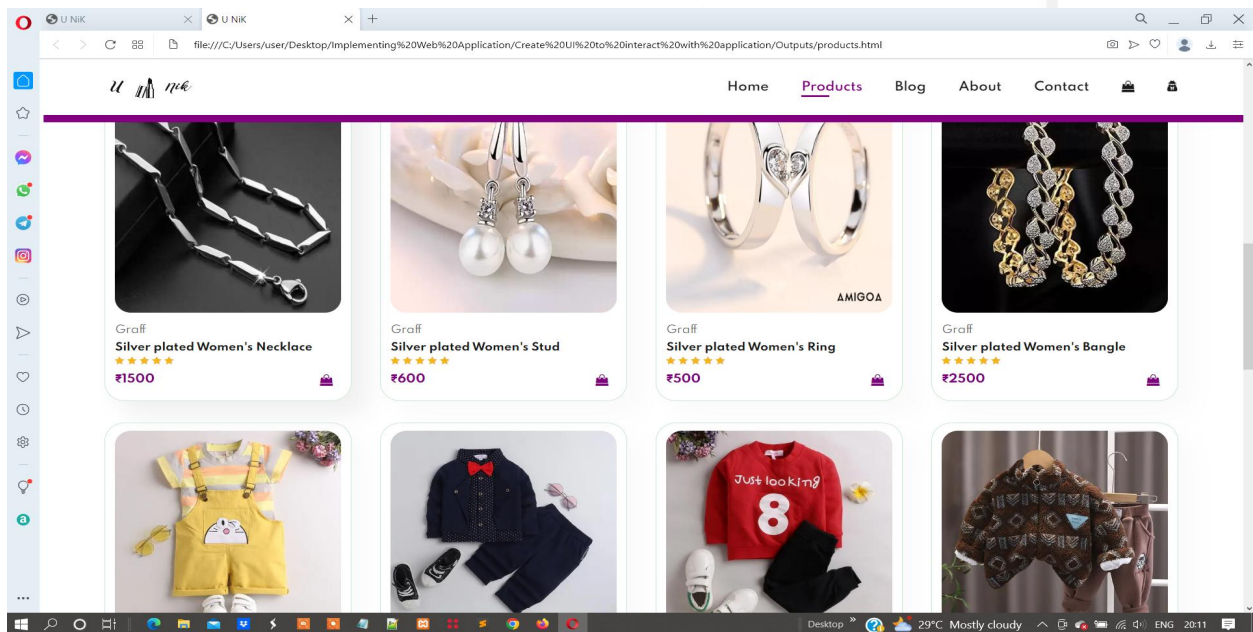
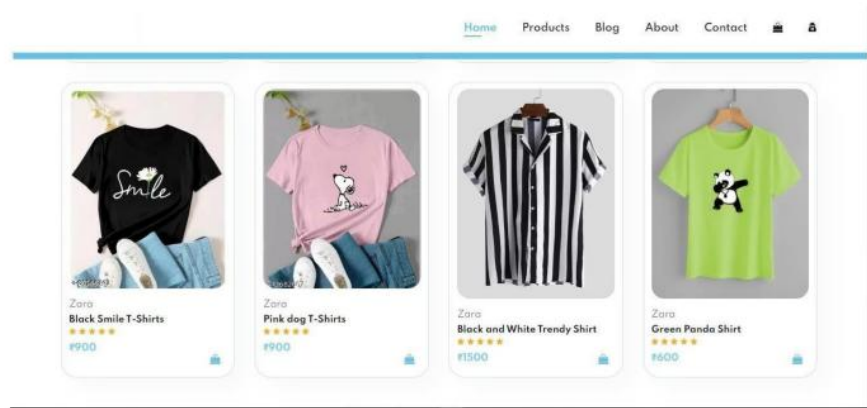


The screenshot shows the Register page of the 'Smart Fashion Recommender Application'. The page has a white background with a black border. At the top, there is a navigation bar with links: Home, Products, Blog, About, Contact, and icons for a shopping cart and user profile. The main heading is "Register". Below it, a subtext says "Please fill in this form to create an account." The form consists of four input fields: "Name" (with placeholder "Enter Name"), "Phone Number" (with placeholder "Enter Phone no"), "Email" (with placeholder "Enter Email"), and "Password" (with placeholder "Enter Password").

Login page:



Product page:



9.RESULTS

1. PERFORMANCE METRICS:

The performance of a recommendation algorithm is evaluated by using some specific metrics that indicate the accuracy of the system. The type of metric used depends on the type of filtering technique. Root Mean Square Error (RMSE), Receiver Operating Characteristics (ROC), Area Under Cover (AUC), Precision, Recall and F1 score is generally used to evaluate the performance or accuracy of the recommendation algorithms.

Root-mean square error (RMSE). RMSE is widely used in evaluating and comparing the performance of a recommendation system model compared to other models. A lower RMSE value indicates higher performance by the recommendation model. RMSE, as mentioned by [61], can be as represented as follows:

where, N_p is the total number of predictions, p_{ui} is the predicted rating that a user u will select an item i and r_{ui} is the real rating.

Precision. Precision can be defined as the fraction of correct recommendations or predictions (known as True Positive) to the total number of recommendations provided, which can be as represented as follows:

It is also defined as the ratio of the number of relevant recommended items to the number of recommended items expressed as percentages.

Recall. Recall can be defined as the fraction of correct recommendations or predictions (known as True Positive) to the total number of correct relevant recommendations provided, which can be as represented as follows:

It is also defined as the ratio of the number of relevant recommended items to the total number of relevant items expressed as percentages.

F1 Score. F1 score is an indicator of the accuracy of the model and ranges from 0 to 1, where a value close to 1 represents higher recommendation or prediction accuracy. It represents precision and recall as a single metric and can be as represented as follows:

Coverage. Coverage is used to measure the percentage of items which are recommended by the algorithm among all of the items.

Accuracy. Accuracy can be defined as the ratio of the number of total correct recommendations to the total recommendations provided, which can be as represented as follows:

Intersection over union (IoU). It represents the accuracy of an object detector used on a specific dataset [62].

ROC. ROC curve is used to conduct a comprehensive assessment of the algorithm's performance [57].

AUC. AUC measures the performance of recommendation and its baselines as well as the quality of the ranking based on pairwise comparisons [5].

Rank aware top-N metrics. The rank aware top-N recommendation metric finds some of the interesting and unknown items that are presumed to be most attractive to a user [63]. Mean reciprocal rank (MRR), mean average precision (MAP) and normalized discounted cumulative gain (NDCG) are three most popular rank aware metrics.

MRR. MRR is calculated as a mean of the reciprocal of the position or rank of first relevant recommendation [64][65]. MRR as mentioned by [64][65] can be expressed as follows:

where u , N_u and R_u indicate specific user, total number of users and the set of items rated by the user, respectively. L indicates list of ranking length (n) for user (u) and k represents the position of the item found in the he lists L .

MAP: MAP is calculated by determining the mean of average precision at the points where relevant products or items are found. MAP as mentioned by [65] can be expressed as follows.

where P_u represents precision in selecting relevant item for the user. NDCG: NDCG is calculated by determining the graded relevance and positional information of the recommended items, which can be expressed as follows [65].

where $D(k)$ is a discounting function, $G(u, n, k)$ is the gain obtained recommending an item found at k -th position from the list L and $G^*(u, n, k)$ is the gain related to k -th item in the ideal ranking of n size for u user.

10.ADVANTAGES & DISADVANTAGES

ADVANTAGES:

1. Smart fashion recommender application is the user friendly.
2. With the help of chatbot user cand find the products very easily.
3. This application used to discover the product based on the user's choice ,
veryeasily and quickly.
4. It have ability to reduce transaction costs for consumers,and increase revenue for retailers.

DISADVANTAGES:

1. It need active internet connection.

2. Privacy concerns.
3. Too many choices.

11. CONCLUSION

The Fashion Recommendation System is mainly used to recommend the best possible outfit combinations to a user who has no fashion sense based on their wardrobe . It may not always provide the best possible outfit to wear for an occasion as the system is dependent completely on the clothes present in the user's wardrobe. Also another reason is that fashion is highly dependent on the time period. However the system does a great job in inculcating a fashion sense among the users and can provide the best recommendations based on the user's wardrobe. Since the system is implemented as a website, it is very easy for the end users to access as well as use. The scope of this system can be expanded by including the ability to detect the various design and patterns on clothing, and to increase the number of occasions.

Recommendation systems have the potential to explore new opportunities for retailers by enabling them to provide customized recommendations to consumers based on information retrieved from the Internet. They help consumers to instantly find the products and services that closely match with their choices.

12. FUTURE SCOPE

In the future, to implement this recommendation system to be extended to include male and non-binary fashion items including apparel, footwear, accessories etc. This work can further be enhanced to predict fashion items based on the skin colour and weather conditions.

Future research should concentrate on including time series analysis and accurate categorization of product images based on the variation in colour, trend and clothing style in order to develop an effective recommendation system. The proposed model will follow brandspecific personalization campaigns and hence it will ensure highly curated and tailored offerings for users. Hence, this research will be highly beneficial for researchers interested in using augmented and virtual reality features to develop recommendation systems.

For different markets, it could split in short-term and long-term recommendations in the future research. Current discussions and reviews are all based on short-term recommendations toward apparel retailing markets. It delivers real-time recommendations straight to the online shoppers as shopping advice and suggestions. Apart from online shopping, recommendations could also be utilized in design and manufacture by providing long term recommendations, such as predicting new trends through years and seasons.

13. APPENDIX

SOURCE CODE

Github Link :<https://github.com/IBM-EPBL/IBM-Project-25137-1659954168>