SMART FASHION RECOMMENDER APPLICATION

A PROJECT REPORT

Submitted by

TEAM ID		**PNT2022TMID32100**
Team Lead	**Rasiga. J**	**(731619205041)**
Team Member 1	**Lingaraja. S**	**(731619205029)**
Team Member 2	**Praveen. D**	**(731619205038)**
Team Member 3	**Roja sree. S**	**(731619205042)**

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CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

Recommender systems help users navigate large collections of products to find items relevant to their interests leveraging large amounts of product information and user signals like product views, followed or ignored items, purchases or web-page visits to determine how, when and what to recommend to their customers. Recommender systems have grown to be an essential part of all large Internet retailers, driving up to 35% of Amazon sales or over 80% of the content watched on Netflix. In this work we are interested in recommender systems that operate in one particular vertical market: garments and fashion products. This setting introduces a particular set of challenges and sub-problems, that are relevant for developing effective recommender systems. Due to market dynamics and customer preferences, there is a large vocabulary of distinct fashion products, as well as high turnover. This leads to sparse purchase data, which challenges the usage of traditional recommender systems. Furthermore, precise and detailed product information is often not available, making it difficult to establish similarity between products. To deal with the aforementioned problems, and given the visual and aesthetic nature of fashion products, there is a growing body of computer vision research addressing tasks like localizing fashion items, determining their category and attributes, or establishing the degree of similarity to other products, to name only a few. Although works in the computer vision literature often don’t consider personalization (or recommendation), their predictions and embeddings can be leveraged by recommender systems and combined with past user preferences, thus mitigating sparsity and cold start problems. Another relevant fashion problem that has attracted the attention of computer vision research is that of combining garments into complete outfits. Several works have studied how to learn the compatibility between fashion items using both professional photos of models wearing designer-created outfits, and social media pictures from ‘influencers and normal people. In addition to allowing recommendations tailored to match the existing shopping basket or wardrobe of

customers, these datasets help uncover other insights useful for recommender systems, such as the structure of fashion styles, social group preferences, or the evolution of trends across time and location. In addition to product-to-product relationships, fashion recommender systems also face particular product-to-user face particular product-to-user uncertainties, like fit, that can hurt the quality of recommendations if not taken into account. Fit prediction is a pain point for online fashion shopping according to customers, and the primary reason for product returns faced by online retailers. The many sizing systems in use throughout the world, as well as their interpretation by different clothing manufacturers, make it very difficult to predict whether a particular product will properly fit a customer. Therefore, research on how to estimate a personalized garment fit has leveraged sources of information like purchase data, customer-reported measurements, or advanced imaging devices such as 3D scanners. Needless to say, this information can be very valuable for recommendation. Several online retailers, like Stitch-Fix and Amazon Prime Wardrobe, recreate the try-out experience of brick-and-mortar stores by shipping a highly tailored assortment of garments to a customer, who can proceed to try them on in their home, and return those that they do not like. Recommender systems can make this approach more sustainable by maximizing the number of items that customers keep [169], but the cold start problem and the commitment required from customers to stay in the membership plan make this approach hard to scale. Consequently, alternatives that would allow a customer to visualize the appearance and fit of clothes in an augmented reality or virtual environment are being researched.

1.2 PURPOSE

Fashion item representation: Traditional recommender systems such as Collaborative Filtering or Content-Based Filtering have difficulties in the fashion domain due to the sparsity of purchase data, or the insufficient detail about the visual appearance of the product in category names. Instead, more recent literature has leveraged models that capture a rich representation of fashion items through product images, text descriptions or customer reviews, or videos which are often learned through surrogate tasks like classification or product retrieval. However, learning product representations from such input data requires large datasets to generalize well across different image styles, attribute variations, etc. Furthermore, constructing

a representation that learns which product features customers take most into account when evaluating fashion products is still an open research problem.

Fashion item compatibility: Training a model that is able to predict if two fashion items ‘go together,’ or directly combine several products into an outfit, is a challenging task. Different item compatibility signals studied in recent literature include co-purchase data, outfits composed by professional fashion designers, or combinations found by analyzing what people wear in social media pictures. From this compatibility information, associated image and text data is then used to learn to generalize to stylistically similar products. Some works explicitly model the latent style types. An additional underexplored difficulty for compatibility prediction is the dependency on trends, seasonality, location or social group. Current approaches usually leverage image and text information.

Personalization and fit: The best fashion product to recommend depends on factors such as the location where the outfit will be used, the season or occasion, or the cultural and social background of the customer. A challenging task in fashion recommendation systems is how to discover and integrate these disparate factors [127, 147]. Current research often tackles these tasks by utilizing large-scale social media data. As discussed earlier, a personalization dimension very particular to the fashion domain is that of fit. In addition to predicting what size of a product will be more comfortable to wear, body shape can influence stylistic choices [58, 60, 122].

Interpretability and Explanation: Most of the existing fashion recommender systems in the literature focus on improving predictive performance, treating the model as a black box. However, deploying accountable and interpretable systems able to explain their recommendations can foster user loyalty in the long term and improve the shopping experience. Current models generally offer explanations through highlighted image regions and attributes or keywords

Discovering Trends: Being able to forecast consumer preferences is valuable for fashion designers and retailers in order to optimize product-to-market fit, logistics and advertising. Many factors are confounded in what features are considered ‘fashionable’ or ‘trendy’, like seasonality, geographical influence, historical events or style dynamics. Again, social media is a useful resource leveraged by researchers.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM

Myntra-Matching Clothes Recommendation:

On selecting a particular item to buy, Myntra automatically suggests a full set of clothes that are matching to the selected item. For example, on selecting a particular t-shirt, the system automatically generates a combination of watches, shoes, pants, etc. that are matching to the selected t-shirt. This system does not take into consideration private qualities of customers like skin color and existing clothes. It will only suggest clothes that already exist in its database.

Your Closet:

This is a mobile application that organizes the closet. The user interface is shown in. The application asks customer to input their clothes. It then matches each cloth with other clothes. For example, if there are 4 shirts and 4 pants, the application matches each shirt with each pant and thus provides 16 possibilities. The application does not make matches of clothes depending upon patterns, color and texture of clothes. It also does not have a recommendation system.

Your Closet App Magic Closet:

This system aims to retrieve clothes from online stores that are matching to the input clothes. These clothes must be ft to a particular occasion. In this system, the user takes a photo of them specifying if they want to use the top or bottom clothes along with the occasion, they want to use it for. The system will search for clothing that matches the user query and satisfies the criterion of wearing aesthetically and wearing properly.

2.2 REFERENCES

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2.Hu, Y.; Manikonda, L.; Kambhampat, S. What we Instagram: A first analysis of Instagram photo content and user types. Available online: htp://www.aaai.org (accessed on 1 May 2014).

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4.Liu, Y.; Gao, Y.; Feng, S.; Li, Z. Weather-to-garment: Weather-oriented clothing recommendation. In Proceedings of the 2017 IEEE International Conference on Multimedia and Expo. (ICME), Hong Kong, China, 31 August 2017; pp. 181– 186, doi:10.1109/ICME.2017.8019476.

5.Chakraborty, S.; Hoque, M.S.; Surid, S.M. A comprehensive review on image-based style prediction and online fashion recommendation. J. Mod. Tech. Eng. 2020, 5, 212–233.

2.3 PROBLEM STATEMENT DEFINITION

In recent years, the huge amount of information and users of the internet service, it is hard to know quickly and accurately what the user wants. This phenomenon leads to an extremely low utilization of information, also known as the information overload problem. Traditionally, keywords are used to retrieve images, but such methods require a lot of annotations on the image data, which will lead to serious problems such as inconsistent, inaccurate, and incomplete descriptions, and a huge amount of work. To solve this problem, Content Based Information Retrieval (CBIR) has gradually become a research hotspot. CBIR retrieves picture objects based entirely on the content. The content of an image needs to be represented by features that represent its uniqueness. Basically, any picture object can be represented by its specific shapes, colors, and textures. These visual characteristics of the image are used as input conditions for the query system, and a result the system will recommended

nearest images and data set. This research designs and implements two-stage deep learning-based model that recommends a clothing fashion style. This model can use deep learning approach to extract various attributes from images with clothes to learn the user's clothing style and preferences. These attributes are provided to the correspondence model to retrieve the contiguous related images for recommendation. Based on data-driven, this thesis uses convolutional neural network as a visual extractor of image objects. This experimental model shows and achieves biter results than the ones of the previous schemes. Recommendation systems are the techniques that are used to predict the rating one individual will give to an item or social entity. The items can include books, movies, restaurants and things on which individuals have different preferences. These preferences are being predicted using two approaches first content-based approach which involves characteristics of an item and second collaborative filtering approaches which considers user's past behavior to evaluate its choices. This thesis proposes a fashion recommendation system which will recommend clothing images supported the style sort of the provided clothing images. In this work, we focus on the images of upper body as well as the lower body clothing and with human model in the images. We have created our own datasets through web scrapping of different ecommerce websites. In this paper we have come up with an idea to build a content-based recommendation system using ResNet-50 convolutional neural network.

CHAPTER 3

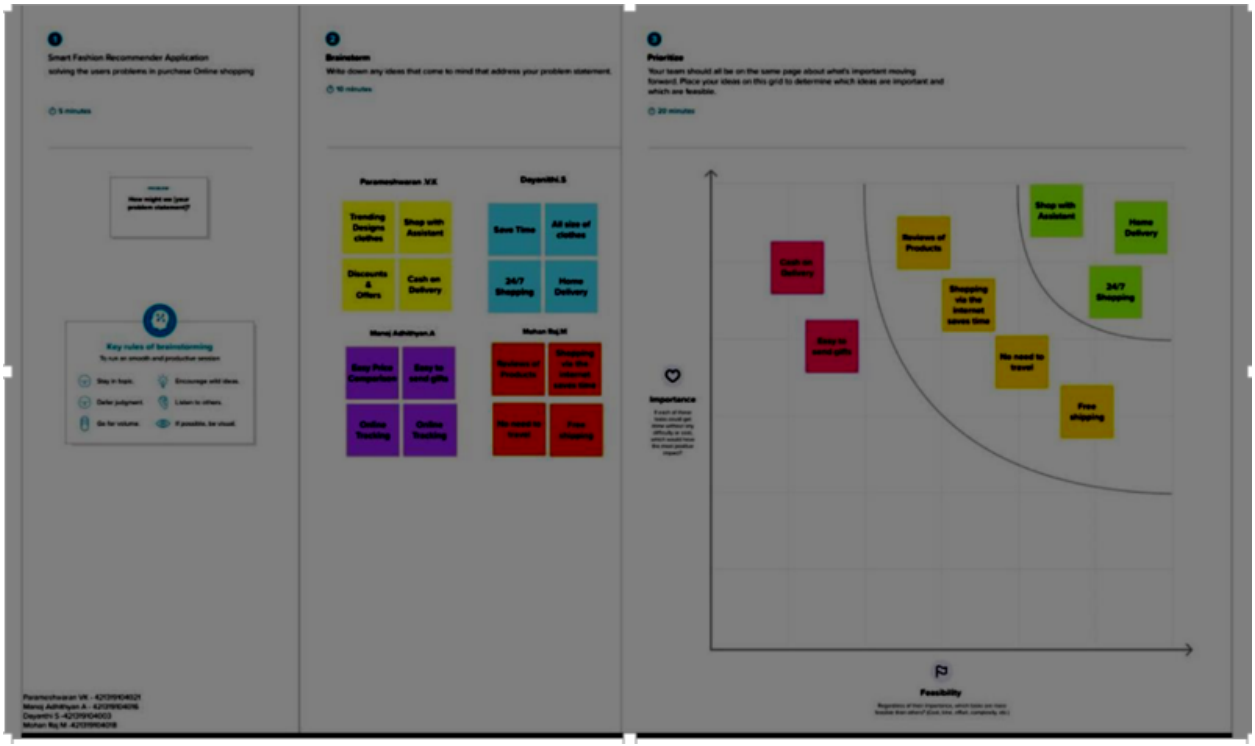
IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviors and attitudes. It is a useful tool to helps 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.

Example:

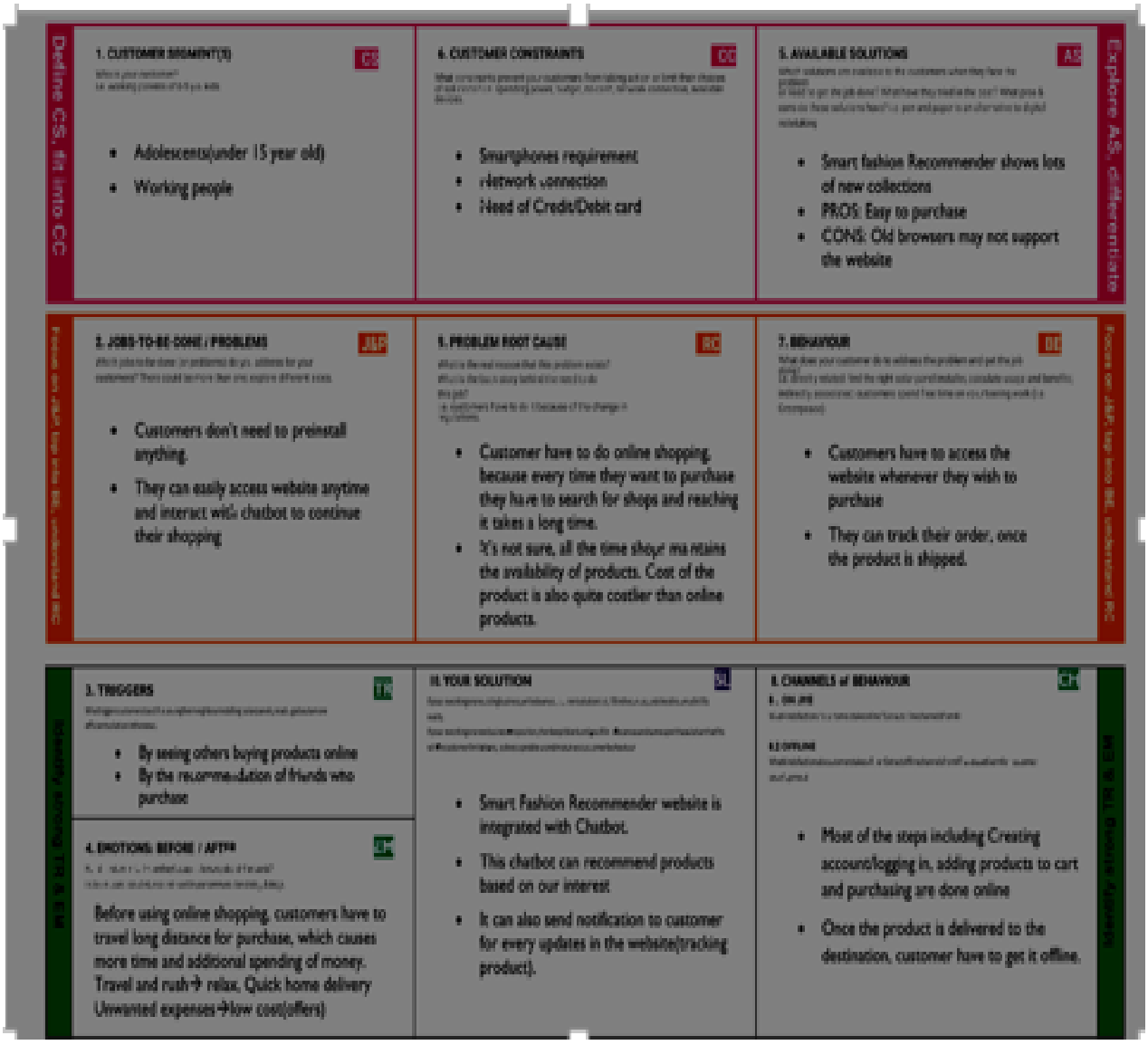
3.2 IDEATION & BRAINSTORMING



3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Smart Recommender application provide users with product information and suggestions, which has gradually become an important research tool in e-commerce IT technology.
2.	Idea / Solution description	A solution through which you can directly do your online shopping based on your choice without any search.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.The recommendations based on information provided by the user.
3.	Novelty / Uniqueness	Recommendation Application recommends the outfit and the order can be placed using a chatbot. Chatbot can provides a 24/7 services.
4.	Social Impact / Customer Satisfaction	The recommendations based on information provided by the user. online shopping based on your choice without any search
5.	Business Model (Revenue Model)	It allows brands to personalize the consumer experience and make suggestions for the items that make the most sense to them. A recommendation engine also lets businesses analyze the customer's current usage and past browsing history to deliver relevant service and product recommendations.
6.	Scalability of the Solution	Recommendation systems are efficient machine learning solutions that can help increase customer satisfaction and user retention, and lead to a significant increase in your business revenues.

3.4 PROBLEM SOLUTION FIT



CHAPTER 4

REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution:

FR No.	Functional Requirements	Sub Registration
FR-1	Registration	Registration can be done using mobile number or gmail and needed some userinformation
FR-2	Login	User only log in by user id and password,Which is given during registration
FR-3	Delivery confirmation	Confirmation via email and phone number
FR-4	Assistance	Bot is integrated with the application to makethe usability simple

4.2 NON-FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	A user-friendly interface with chat bot to make usability efficient
NFR-2	Security	Secured connection HTTPS should be established for transmitting requests and responses
NFR-3	Reliability	The system should handle excepted as well as unexpected errors and exceptions to avoid termination of the program
NFR-4	Performance	The system shall be able to handle multiple requests at any given point in time and generate an appropriate response.
NFR-5	Availability	It is a cloud based web application so user canaccess without any platform limitations ,justusing a browsers with a internet connection isenough for use the application

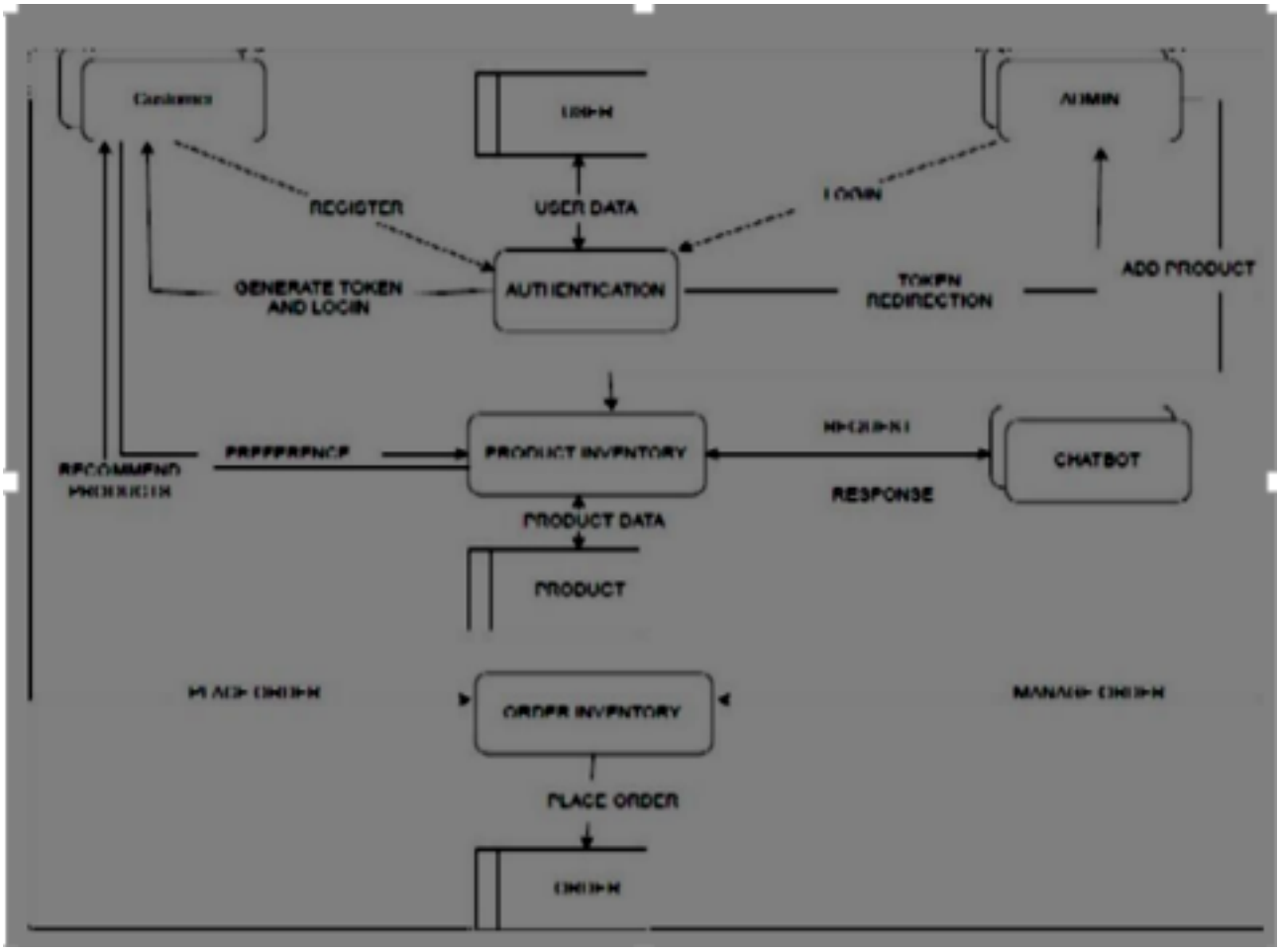
CHAPTER 5

PROJECT DESIGN

5.1 DATA FLOW DIAGRAM

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.

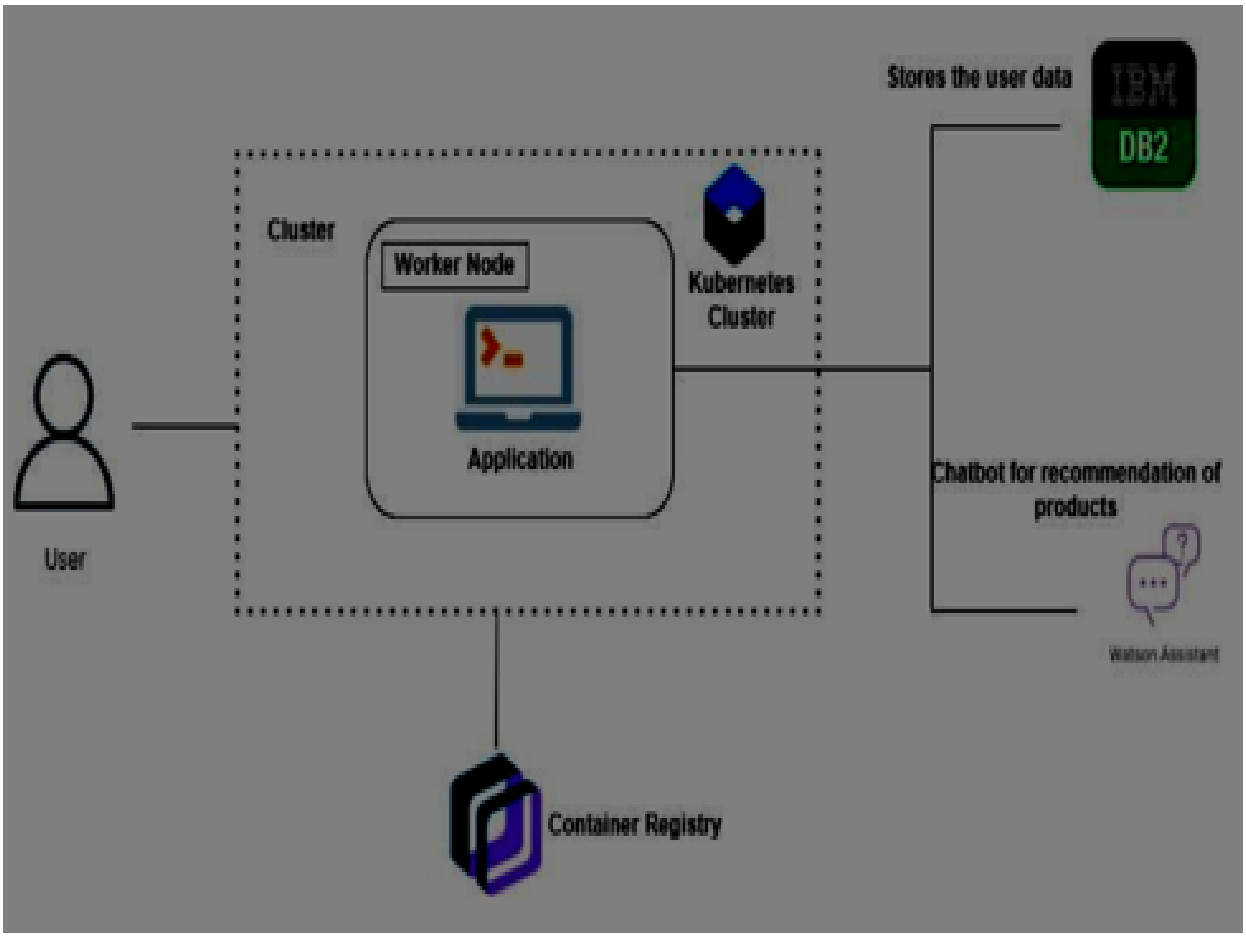
Data Flow Diagram for the proposed solution:



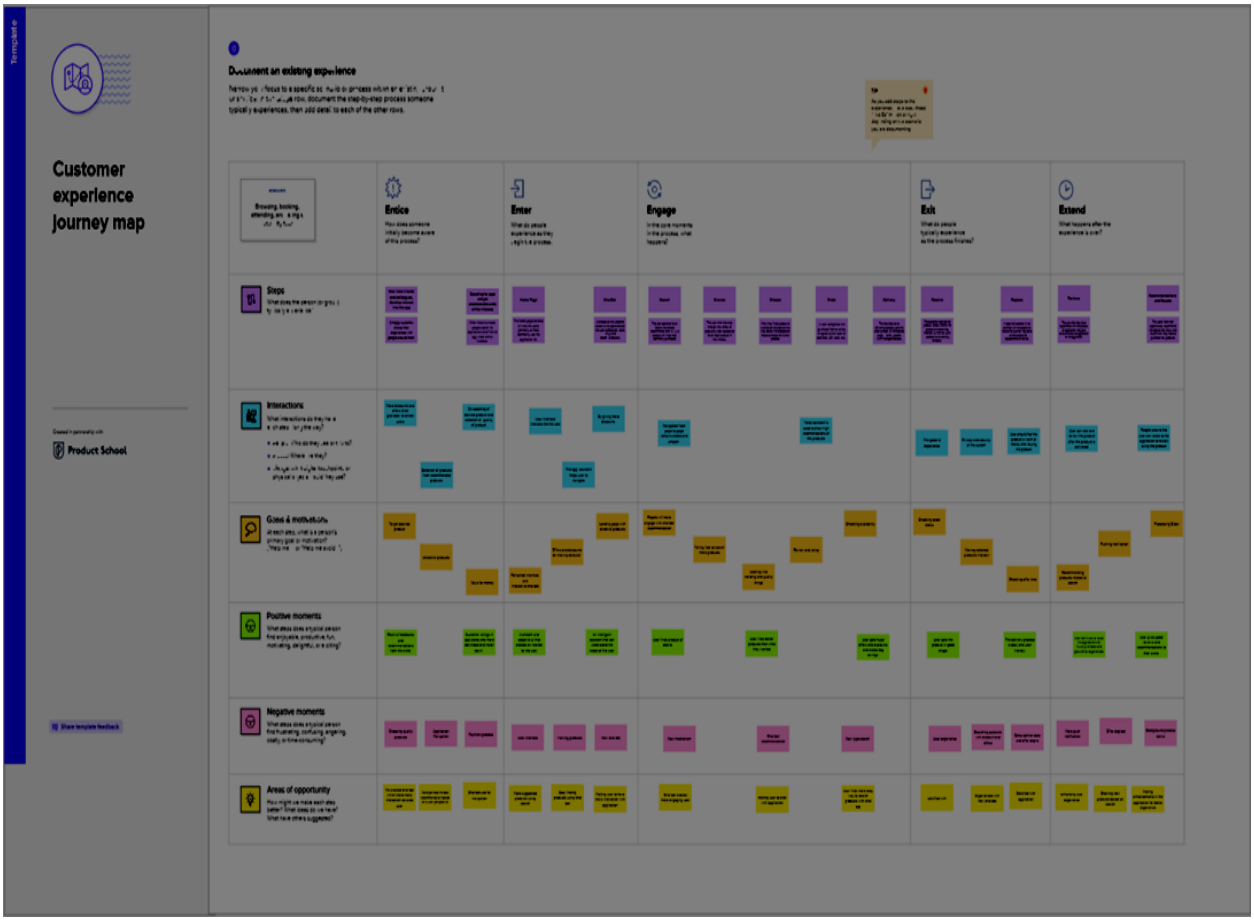
5.2 SOLUTION & TECHNICAL ARCHITECTURE

A new innovative solution through which you can directly do your online shopping based on your choice without any search. 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. The recommendations based on information provided by the user.

Solution Architecture Diagram:



5.3 USER STORIES



CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

TITLE	DESCRIPTION	DATE
Literature Survey & Information Gathering	Literature survey on the project & gathering on by referring the, technical search publications etc.	15 SEPTEMBER 2022
Prepare Empathy Map	Literature survey on the project & gathering on by referring the, technical search publications etc.	15 SEPTEMBER 2022
Ideation	List the by organizing the ning session and prioritize the as based on the feasibility & ce.	15 SEPTEMBER 2022
Proposed Solution	List the by organizing the ning session and prioritize the as based on the feasibility &	24 SEPTEMBER 2022

	ce.	
Problem Solution Fit	Prepare problem - solution fit t.	1 OCTOBER 2022
Solution Architecture	Prepare solution architecture t.	7 OCTOBER 2022
Customer Journey	Prepare the customer journey maps to understand the user interactions & experiences with the application (entry to exit).	17 OCTOBER 2022
Functional Requirement	Prepare the functional requirement document.	17 OCTOBER 2022
Data Flow Diagrams	Draw the data flow diagrams and submit for review.	17 OCTOBER 2022
Technology Architecture	Prepare the technology architecture diagram.	17 OCTOBER 2022
Prepare	Prepare the milestones &	28 OCTOBER 2022

Milestone & Activity List	activity list of the project	

6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story/ Task	Story Points	Priority	TeamMembers
Sprint-1	AdminPanel	USN-1	As a Admin, • Can login • Products- CRUD • Users List • OrdersList	20	High	PRAVEEN D LINGARAJA S ROJA SREE S RASIGA J
Sprint-2	User Panel	USN-2	As a user, • Register , Login , EmailVerification • ManualSearch • Order placement, OrderDetails	20	High	PRAVEEN D LINGARAJA S ROJA SREE S RASIGA J
Sprint-3	ChatBot	USN-3	• Automatic product search based on user information • Can make order without any manual process	20	High	PRAVEEN D LINGARAJA S ROJA SREE S RASIGA J

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Sprint	Total Story Points	Duration	SprintStart Date	SprintEndDate (Planned)	Story Points Completed (as on PlannedEndDate)	SprintRelease Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022		29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022		05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022		12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022		19 Nov 2022

CHAPTER 7

CODING & SOLUTIONING

7.1 FEATURE 1

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

<head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Ecommerce Website Design</title>

    <link rel="stylesheet"
        href="https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-
free@6.2.0/css/fontawesome.min.css">
    <link rel="stylesheet" href="{{ url_for('static', filename='home.css')}}" />
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.2.0/css/all.min.css">
    <script src="./index.js" defer></script>
</head>

<body>
    <div class="header">
        <div class="container">
            <div class="navbar">
                <div class="logo">
                    <img src="{{ url_for('static', filename='./images/logo.png')}}" alt="" />

                </div>
                <nav>
                    <ul id="MenuItems">
```

```
                <li><a href="/home">Home</a></li>
                <li><a href="/products">Products</a></li>
                <li><a href="/about">About</a></li>
                <li><a href="/contact">Contact</a></li>
            </ul>
        </nav>
        <img src="{{ url_for('static', filename='./images/cart.png')}}" alt="error" width="30px"
height="30px">
        <img src="{{ url_for('static', filename='./images/menu.png')}}" class="menu-icon"
alt="error"
            width="30px" height="30px">
    </div>
    <div class="row">
        <div class="col-2">
            <h1>
                Give Your Workout <br />
                A New Style!
            </h1>
            <p>
                Success isn't always about greatness. It's about consistency.
                Consistency <br />
                hard work gains success. Greatness will come.
            </p>
            <a href="#" class="btn">Explore Now &#8594</a>
        </div>
        <div class="col-2">
            <img src="{{ url_for('static', filename='./images/image1.png')}}" alt="error" />
        </div>
    </div>
  </div>
  <!-----------------------------Featured Categories ---------------------- -->
  <div class="categories">
```

```
    <div class="small-container">
        <div class="row">
            <div class="col-3">
                <img src="{{ url_for('static', filename='./images/category-1.jpg')}}" alt="error" />
            </div>
            <div class="col-3">
                <img src="{{ url_for('static', filename='./images/category-2.jpg')}}" alt="error" />
            </div>
            <div class="col-3">
                <img src="{{ url_for('static', filename='./images/category-3.jpg')}}" alt="error" />

            </div>
        </div>
    </div>
</div>

<!-------------------------------Featured Products ---------------------------->
<div class="small-container">
    <h2 class="title">Featured Products</h2>
    <div class="row">
        <div class="col-4">
            <img src="{{ url_for('static', filename='./images/product-1.jpg')}}" alt="error">
            <h4>Red Printed T-Shirt</h4>
            <div class="rating">
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-regular fa-star-half-stroke"></i>
            </div>
            <p>₹250</p>
        </div>
        <div class="col-4">
```

```
    <img src="{{ url_for('static', filename='./images/product-2.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-3.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-4.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-solid fa-star"></i>
      <i class="fa-regular fa-star-half-stroke"></i>
```

```
        </div>
        <p>₹250</p>
    </div>
</div>

<h2 class="title">Latest Products</h2>
<div class="row">
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-5.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-6.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-7.jpg')}}" alt="error">
```

```
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-8.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
</div>
<div class="row">
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-9.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
```

```
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-10.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-11.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-12.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
```

```
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-regular fa-star-half-stroke"></i>
            </div>
            <p>₹250</p>
        </div>
    </div>
</div>
<div class="offer">
    <div class="small-container">
        <div class="row">
            <div class="col-2">
                <img class="offer-img" src="{{ url_for('static', filename='./images/exclusive.png')}}"
alt="error">
            </div>
            <div class="col-2">
                <p>Exclusively Available on Offer</p>
                <h1>Smart Band 4</h1>
                <small>The Mi smart Band 4 features a 39.8% larger AMOLED color full-touch display
with adjustable
                    brightness, so everything is clear as can be.</small>
                <br>
                <a class="btn" href="">Buy Now &#8594;</a>
            </div>
        </div>
    </div>
</div>

<div class="testimonal">
    <div class="small-container">
        <div class="row">
            <div class="col-3">
                <i class="fa fa-quote-left"></i>
```

```
            <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Magni, recusandae maxime ipsa ab
                assumenda non necessitatibus repudiandae distinctio enim accusamus harum, voluptatibus
                repellendus aut unde molestias, dolorem officia fuga sapiente?</p>
            <div class="rating">
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-regular fa-star-half-stroke"></i>
            </div>

            <img src="{{ url_for('static', filename='./images/user-1.png')}}">
            <h3>Sean Parker</h3>
        </div>
        <div class="col-3">
            <i class="fa fa-quote-left"></i>
            <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Magni, recusandae maxime ipsa ab
                assumenda non necessitatibus repudiandae distinctio enim accusamus harum, voluptatibus
                repellendus aut unde molestias, dolorem officia fuga sapiente?</p>
            <div class="rating">
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-regular fa-star-half-stroke"></i>
            </div>
            <img src="{{ url_for('static', filename='./images/user-2.png')}}">
            <h3>Mike Smith</h3>
        </div>
```

```
            <div class="col-3">
                <i class="fa fa-quote-left"></i>
                <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Magni, recusandae maxime ipsa ab
                    assumenda non necessitatibus repudiandae distinctio enim accusamus harum, voluptatibus
                    repellendus aut unde molestias, dolorem officia fuga sapiente?</p>
                <div class="rating">
                    <i class="fa-solid fa-star"></i>
                    <i class="fa-solid fa-star"></i>
                    <i class="fa-solid fa-star"></i>
                    <i class="fa-solid fa-star"></i>
                    <i class="fa-regular fa-star-half-stroke"></i>
                </div>
                <img src="{{ url_for('static', filename='./images/user-3.png')}}">
                <h3>Mabel Joe</h3>
            </div>
        </div>
    </div>
</div>

<div class="footer">
    <div class="container">
        <div class="row">
            <div class="footer-col-1">
                <h3>Download Our App</h3>
                <p>Download App for Android and ios mobile phone</p>
                <div class="app-logo">
                    <img src="{{ url_for('static', filename='./images/play-store.png')}}">
                    <img src="{{ url_for('static', filename='./images/app-store.png')}}">
                </div>
            </div>
            <div class="footer-col-2">
```

```
                <img src="{{ url_for('static', filename='./images/logo-white.png')}}">
                <p>Our Purpose Is To Sustainably Make the Pleasure and Benefits of Sports Accessible to the Many.
                </p>
            </div>
            <div class="footer-col-3">
                <h3>Usefull Links</h3>
                <ul>
                    <li>Coupons</li>
                    <li>Blog Post</li>
                    <li>Return Policy</li>
                    <li>Join Affiliate</li>

                </ul>
            </div>
            <div class="footer-col-4">
                <h3>Follow us</h3>
                <ul>
                    <li>Facebook</li>
                    <li>Twitter</li>
                    <li>Instagram</li>
                    <li>YouTube</li>
                </ul>
            </div>
        </div>
        <hr>
        <p class="copy-right">Copyright 2023 - Lingaraja</p>
    </div>
</div>

<script>
    window.watsonAssistantChatOptions = {
        integrationID: "00a4e357-b1de-4715-9fec-01efd1a1721a", // The ID of this integration.
```

```
            region: "au-syd", // The region your integration is hosted in.
            serviceInstanceID: "dcdd2307-7240-4be6-8975-3ad74354c329", // The ID of your service instance.
            onLoad: function (instance) { instance.render(); }
        };
        setTimeout(function () {
            const t = document.createElement('script');
            t.src = "https://web-chat.global.assistant.watson.appdomain.cloud/versions/" + (window.watsonAssistantChatOptions.clientVersion || 'latest') + "/WatsonAssistantChatEntry.js";
            document.head.appendChild(t);
        });
        const menuIcon = document.querySelector('.menu-icon');
        const itemss = document.querySelector("#MenuItems");


        menuIcon.addEventListener('click', () => {
            if (itemss.style.maxHeight == '0px') {
                itemss.style.maxHeight = '200px';
            } else {
                itemss.style.maxHeight = '0px';
            }
        })
    </script>
</body>

</html>
```

CSS

```
* {
    padding: 0;
    margin: 0;
    box-sizing: border-box;
```

```
}

body {
    font-family: "Poppins", sans-serif;
}

.logo img {
    width: 8rem;
}

.navbar {
    display: flex;
    align-items: center;
    padding: 1.1rem;
}

nav {
    flex: 1;
    text-align: right;
}

nav ul {
    display: inline-block;
    list-style-type: none;
}

nav ul li {
    display: inline-block;
    margin-right: 20px;
}

a {
    text-decoration: none;
```

```
    color: #555;
}

a:hover {
    color: #ff523b;
}

p {
    color: #555;
}

.container {
    max-width: 1300px;
    margin: auto;
    padding-left: 25px;
    padding-right: 25px;
}

.row {
    display: flex;
    align-items: center;
    flex-wrap: wrap;
    justify-content: space-around;
}

.col-2 {
    flex-basis: 50%;
    min-width: 300px;
}

.col-2 img {
    max-width: 100%;
    padding: 50px 0;
```

```
}

.col-2 img h1 {
    font-size: 50px;
    line-height: 60px;
    margin: 25px 0;
}

.btn {
    color: #fff;
    display: inline-block;
    background-color: #ff523b;
    padding: 8px 30px;
    margin: 30px 0;
    border-radius: 30px;
    transition: all 0.5s;
}

.btn:hover {
    background: #563434;
}

.header {
    background: linear-gradient(#fff, #ffd6d6);
}

.header .row {
    margin-top: 40px;
}

.categories {
    margin: 70px 0;
}
```

```
.col-3 {
    flex-basis: 30%;
    min-width: 250px;
    margin-bottom: 30px;
}

.col-3 img {
    width: 100%;
}

.small-container {
    max-width: 1080px;
    margin: auto;
    padding-left: 25px;
    padding-right: 25px;
}

.col-4 {
    flex-basis: 25%;
    padding: 10px;
    min-width: 200px;
    margin-bottom: 50px;
    cursor: pointer;
    transition: all 0.5s;
}

.col-4 img {
    width: 100%;
}

.title {
    text-align: center;
```

```
    margin: 0 auto 80px;
    position: relative;
    line-height: 60px;
    color: #555;
}

.title::after {
    content: "";
    background: #ff523b;
    width: 80px;
    height: 5px;
    border-radius: 5px;
    position: absolute;
    bottom: 0;
    left: 50%;
    transform: translateX(-50%);
}

h4 {
    color: #555;
    font-weight: normal;
}

.col-4 p {
    font-size: 14px;
}

.rating .fa-star,
.fa-regular {
    color: #ff523b;
}

.col-4:hover {
```

```
    transform: translateY(-5px);
}

.offer {
    background: linear-gradient(#fff, #ffd6d6);
    margin-top: 80px;
    padding: 30px 0;
}

.col-2 .offer-img {
    padding: 50px;
}

small {
    color: #555;
}

.testimonal {
    padding-top: 100px;
}

.testimonal .col-3 {
    text-align: center;
    padding: 40px 20px;
    box-shadow: 0 0 20px 0px rgba(0, 0, 0, 0.1);
    cursor: pointer;
    transition: all 0.5s;
}

.testimonal .col-3:hover {
    transform: translateY(-10px);
}
```

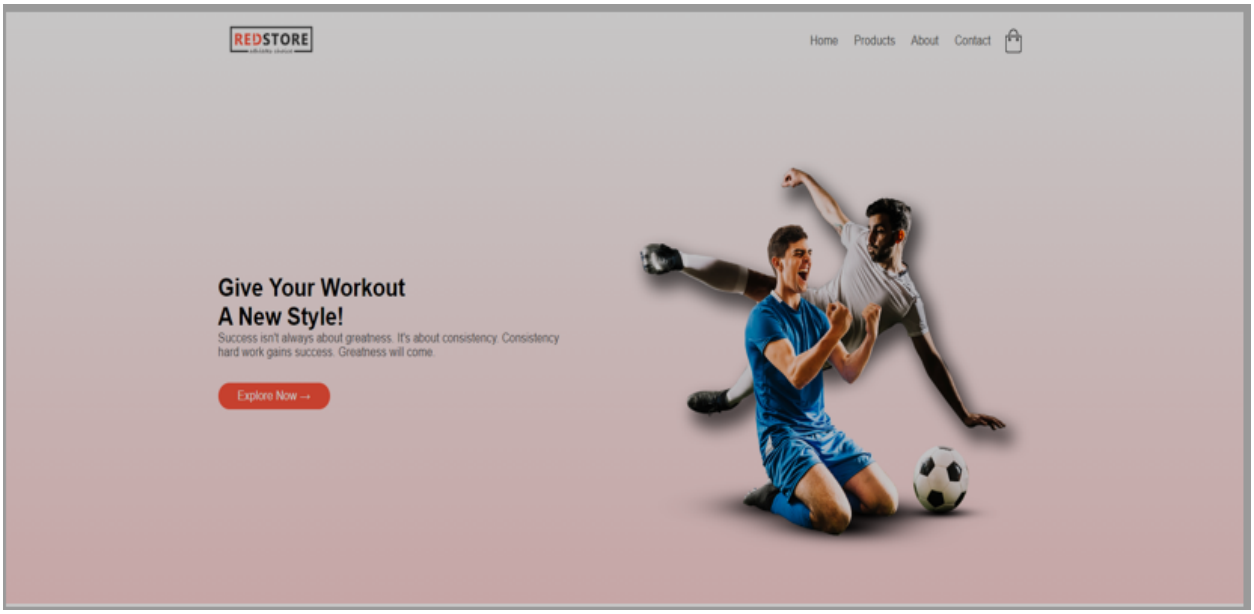
```
.testimonal .col-3 img {
    width: 50px;
    margin-top: 20px;
    border-radius: 50%;
}

.fa-quote-left {
    font-size: 34px;
    color: #ff523b;
}

.col-3 p {
    font-size: 12px;
    margin: 12px 0;
    color: #777;
}

.testimonal .col-3 h3 {
    font-weight: 600;
    color: #555;
    font-size: 16px;
}

.footer {
    background: #000;
    color: #8a8a8a;
    font-size: 14px;
    padding: 60px 0 20px;
}

.footer p {
    color: #8a8a8a;
}
```

```css
.footer h3 {
    color: #fff;
    margin-bottom: 20px;
}

.footer-col-1,
.footer-col-2,
.footer-col-3,
.footer-col-4 {
    min-width: 250px;
    margin-bottom: 20px;
}

.footer-col-1 {
    flex-basis: 30%;
}

.footer-col-2 {
    flex: 1;
    text-align: center;
}

.footer-col-2 img {
    width: 180px;
    margin-bottom: 20px;
}

.footer-col-3,
.footer-col-4 {
    flex-basis: 12%;
    text-align: center;
}
```

```
ul {
    list-style-type: none;
}

.app-logo {
    margin-top: 20px;
}

.app-logo img {
    width: 140px;
}

.footer hr {
    border: none;
    background: #b5b5b5;
    height: 1px;
    margin: 20px 0;
}

.copy-right {
    text-align: center;
}

.menu-icon {
    width: 28px;
    margin-left: 20px;
    display: none;
}

@media only screen and (max-width: 800px) {
    nav ul {
        position: absolute;
```

```
        height: 300px;
        top: 70px;
        left: 0;
        background: #333;
        width: 100%;
        overflow: hidden;
        transition: max-height 0.5s;
    }

    nav ul li {
        display: block;
        margin-right: 50px;
        margin-top: 26px;
        margin-bottom: 10px;
    }

    nav ul li a {
        color: #fff;
    }

    .menu-icon {
        display: block;
        cursor: pointer;
    }
}

@media only screen and (max-width: 600px) {
    .row {
        text-align: center;
    }
    .col-2,
    .col-3,
    .col-4 {
```

```
        flex-basis: 100%;
    }
}
```



7.2 FEATURE 2

HTML File:

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

<head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Ecommerce Website Design</title>

    <link rel="stylesheet"
        href="https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-
```

```
free@6.2.0/css/fontawesome.min.css">
    <link rel="stylesheet" href="{{ url_for('static', filename='products.css')}}" />
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.2.0/css/all.min.css">
</head>

<body>
    <div class="container">
        <div class="navbar">
            <div class="logo">
                <img src="{{ url_for('static', filename='./images/logo.png')}}" alt="" />
            </div>
            <nav>
                <ul id="MenuItems">
                    <li><a href="/home">Home</a></li>
                    <li><a href="/products">Products</a></li>
                    <li><a href="/about">About</a></li>
                    <li><a href="/contact">Contact</a></li>
                </ul>
            </nav>
            <img src="{{ url_for('static', filename='./images/cart.png')}}" alt="error" width="30px"
height="30px">
            <img src="{{ url_for('static', filename='./images/menu.png')}}" class="menu-icon"
alt="error" width="30px"
                height="30px">
        </div>

    </div>

    <div class="small-container">

        <div class="row row2">
            <h2>All Products</h2>
```

```
    <select>
        <option>Default Shorting</option>
        <option>Short by price</option>
        <option>Short by popularity</option>
        <option>Short by rating</option>
        <option>Short by sale</option>
    </select>
</div>

<div class="row">
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-1.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">

        <img src="{{ url_for('static', filename='./images/product-2.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
```

```
            <p>₹250</p>
        </div>
        <div class="col-4">
            <img src="{{ url_for('static', filename='./images/product-3.jpg')}}" alt="error">
            <h4>Red Printed T-Shirt</h4>
            <div class="rating">
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-regular fa-star-half-stroke"></i>
            </div>
            <p>₹250</p>
        </div>
        <div class="col-4">
            <img src="{{ url_for('static', filename='./images/product-4.jpg')}}" alt="error">
            <h4>Red Printed T-Shirt</h4>
            <div class="rating">
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-solid fa-star"></i>
                <i class="fa-regular fa-star-half-stroke"></i>
            </div>
            <p>₹250</p>
        </div>

    </div>
    <div class="row">
        <div class="col-4">
            <img src="{{ url_for('static', filename='./images/product-5.jpg')}}" alt="error">
            <h4>Red Printed T-Shirt</h4>
            <div class="rating">
```

```
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-6.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
    <img src="{{ url_for('static', filename='./images/product-7.jpg')}}" alt="error">
    <h4>Red Printed T-Shirt</h4>
    <div class="rating">
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-solid fa-star"></i>
        <i class="fa-regular fa-star-half-stroke"></i>
    </div>
    <p>₹250</p>
</div>
<div class="col-4">
```

```
        <img src="{{ url_for('static', filename='./images/product-8.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
</div>
<div class="row">
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-9.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-10.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
```

```
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-11.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
    <div class="col-4">
        <img src="{{ url_for('static', filename='./images/product-12.jpg')}}" alt="error">
        <h4>Red Printed T-Shirt</h4>
        <div class="rating">
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-solid fa-star"></i>
            <i class="fa-regular fa-star-half-stroke"></i>
        </div>
        <p>₹250</p>
    </div>
</div>

<div class="page-btn">
    <span>1</span>
    <span>2</span>
```

```
        <span>3</span>
        <span>4</span>
        <span>&#8594;</span>
      </div>
    </div>
    <div class="footer">
      <div class="container">
        <div class="row">
          <div class="footer-col-1">
            <h3>Download Our App</h3>
            <p>Download App for Android and ios mobile phone</p>
            <div class="app-logo">
              <img src="{{ url_for('static', filename='./images/play-store.png')}}">
              <img src="{{ url_for('static', filename='./images/app-store.png')}}">
            </div>
          </div>
          <div class="footer-col-2">
            <img src="{{ url_for('static', filename='./images/logo-white.png')}}">
            <p>Our Purpose Is To Sustainably Make the Pleasure and Benefits of Sports Accessible
to the Many.
            </p>
          </div>
          <div class="footer-col-3">
            <h3>Usefull Links</h3>
            <ul>
              <li>Coupons</li>
              <li>Blog Post</li>
              <li>Return Policy</li>
              <li>Join Affiliate</li>

            </ul>
          </div>
          <div class="footer-col-4">
```

```
                <h3>Follow us</h3>
                <ul>
                    <li>Facebook</li>
                    <li>Twitter</li>
                    <li>Instagram</li>
                    <li>YouTube</li>
                </ul>
            </div>
        </div>
        <hr>
        <p class="copy-right">Copyright 2023 - Lingaraja</p>
    </div>
</div>

<script>
    const menuIcon = document.querySelector('.menu-icon');
    const itemss = document.querySelector("#MenuItems");


    menuIcon.addEventListener('click', () => {
        if (itemss.style.maxHeight == '0px') {
            itemss.style.maxHeight = '200px';
        } else {
            itemss.style.maxHeight = '0px';
        }
    })
</script>
</body>

</html>
```

CSS File:

```
* {
```

```
    padding: 0;
    margin: 0;
    box-sizing: border-box;
}

body {
    font-family: "Poppins", sans-serif;
}

.logo img {
    width: 8rem;
}

.navbar {
    display: flex;
    align-items: center;
    padding: 1.1rem;
}

nav {
    flex: 1;
    text-align: right;
}

nav ul {
    display: inline-block;
    list-style-type: none;
}

nav ul li {
    display: inline-block;
    margin-right: 20px;
}
```

```css
a {
    text-decoration: none;
    color: #555;
}

a:hover {
    color: #ff523b;
}
p {
    color: #555;
}

.container {
    max-width: 1300px;
    margin: auto;
    padding-left: 25px;
    padding-right: 25px;
}

.row {
    display: flex;
    align-items: center;
    flex-wrap: wrap;
    justify-content: space-around;
}

.col-2 {
    flex-basis: 50%;
    min-width: 300px;
}

.col-2 img {
```

```
    max-width: 100%;
    padding: 50px 0;
}

.col-2 img h1 {
    font-size: 50px;
    line-height: 60px;
    margin: 25px 0;
}

.btn {
    color: #fff;
    display: inline-block;
    background-color: #ff523b;
    padding: 8px 30px;
    margin: 30px 0;
    border-radius: 30px;
    transition: all 0.5s;
}

.btn:hover {
    background: #563434;
}

.header .row {
    margin-top: 40px;
}

.categories {
    margin: 70px 0;
}

.col-3 {
```

```
    flex-basis: 30%;
    min-width: 250px;
    margin-bottom: 30px;
}

.col-3 img {
    width: 100%;
}

.small-container {
    max-width: 1080px;
    margin: auto;
    padding-left: 25px;
    padding-right: 25px;
}

.col-4 {
    flex-basis: 25%;
    padding: 10px;
    min-width: 200px;
    margin-bottom: 50px;
    cursor: pointer;
    transition: all 0.5s;
}

.col-4 img {
    width: 100%;
}

.title {
    text-align: center;
    margin: 0 auto 80px;
    position: relative;
```

```
    line-height: 60px;
    color: #555;
}

.title::after {
    content: "";
    background: #ff523b;
    width: 80px;
    height: 5px;
    border-radius: 5px;
    position: absolute;
    bottom: 0;
    left: 50%;
    transform: translateX(-50%);
}

h4 {
    color: #555;
    font-weight: normal;
}

.col-4 p {
    font-size: 14px;
}

.rating .fa-star,
.fa-regular {
    color: #ff523b;
}

.col-4:hover {
    transform: translateY(-5px);
}
```

```
.offer {
    background: linear-gradient(#fff, #ffd6d6);
    margin-top: 80px;
    padding: 30px 0;
}

.col-2 .offer-img {
    padding: 50px;
}

small {
    color: #555;
}

.testimonal {
    padding-top: 100px;
}

.testimonal .col-3 {
    text-align: center;
    padding: 40px 20px;
    box-shadow: 0 0 20px 0px rgba(0, 0, 0, 0.1);
    cursor: pointer;
    transition: all 0.5s;
}

.testimonal .col-3:hover {
    transform: translateY(-10px);
}

.testimonal .col-3 img {
    width: 50px;
```

```
    margin-top: 20px;
    border-radius: 50%;
}

.fa-quote-left {
    font-size: 34px;
    color: #ff523b;
}

.col-3 p {
    font-size: 12px;
    margin: 12px 0;
    color: #777;
}

.testimonal .col-3 h3 {
    font-weight: 600;
    color: #555;
    font-size: 16px;
}

.footer {
    background: #000;
    color: #8a8a8a;
    font-size: 14px;
    padding: 60px 0 20px;
}

.footer p {
    color: #8a8a8a;
}

.footer h3 {
```

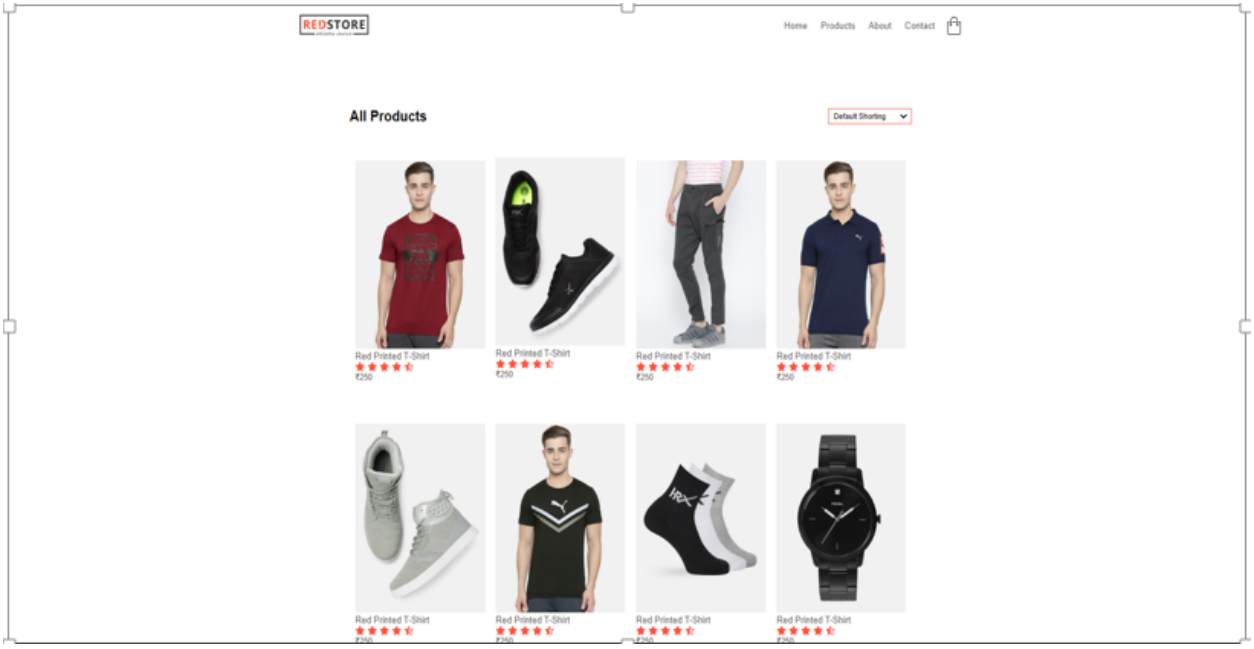
```
    color: #fff;
    margin-bottom: 20px;
}

.footer-col-1,
.footer-col-2,
.footer-col-3,
.footer-col-4 {
    min-width: 250px;
    margin-bottom: 20px;
}

.footer-col-1 {
    flex-basis: 30%;
}

.footer-col-2 {
    flex: 1;
    text-align: center;
}

.footer-col-2 img {
    width: 180px;
    margin-bottom: 20px;
}

.footer-col-3,
.footer-col-4 {
    flex-basis: 12%;
    text-align: center;
}

ul {
```

```
    list-style-type: none;
}

.app-logo {
    margin-top: 20px;
}

.app-logo img {
    width: 140px;
}

.footer hr {
    border: none;
    background: #b5b5b5;
    height: 1px;
    margin: 20px 0;
}

.copy-right {
    text-align: center;
}

.menu-icon {
    width: 28px;
    margin-left: 20px;
    display: none;
}

@media only screen and (max-width: 800px) {
    nav ul {
        position: absolute;
        height: 300px;
        top: 70px;
```

```
        left: 0;
        background: #333;
        width: 100%;
        overflow: hidden;
        transition: max-height 0.5s;
    }

    nav ul li {
        display: block;
        margin-right: 50px;
        margin-top: 26px;
        margin-bottom: 10px;
    }

    nav ul li a {
        color: #fff;
    }

    .menu-icon {
        display: block;
        cursor: pointer;
    }
}

.row2 {
    justify-content: space-between;
    margin: 100px auto 50px;
}

select {
    border: 1px solid #ff523b;
    padding: 5px;
}
```

```
select:focus {
    outline: none;
}

.page-btn {
    margin: 0 auto 80px;
}

.page-btn span {
    display: inline-block;
    border: 1px solid #ff523b;
    margin-left: 10px;
    width: 40px;
    height: 40px;
    text-align: center;
    line-height: 40px;
    cursor: pointer;
}

.page-btn span:hover {
    background-color: #ff523b;
}

@media only screen and (max-width: 600px) {
    .row {
        text-align: center;
    }
    .col-2,
    .col-3,
    .col-4 {
        flex-basis: 100%;
    }
```

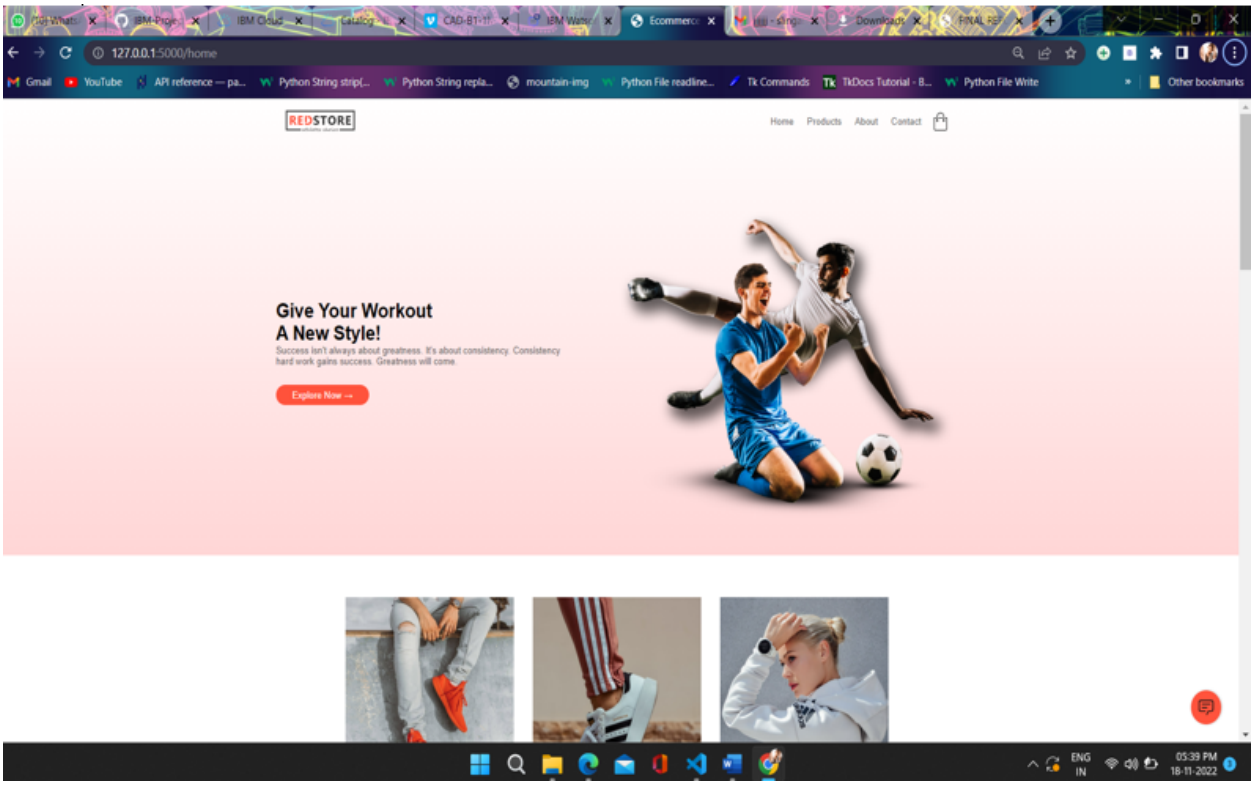
}

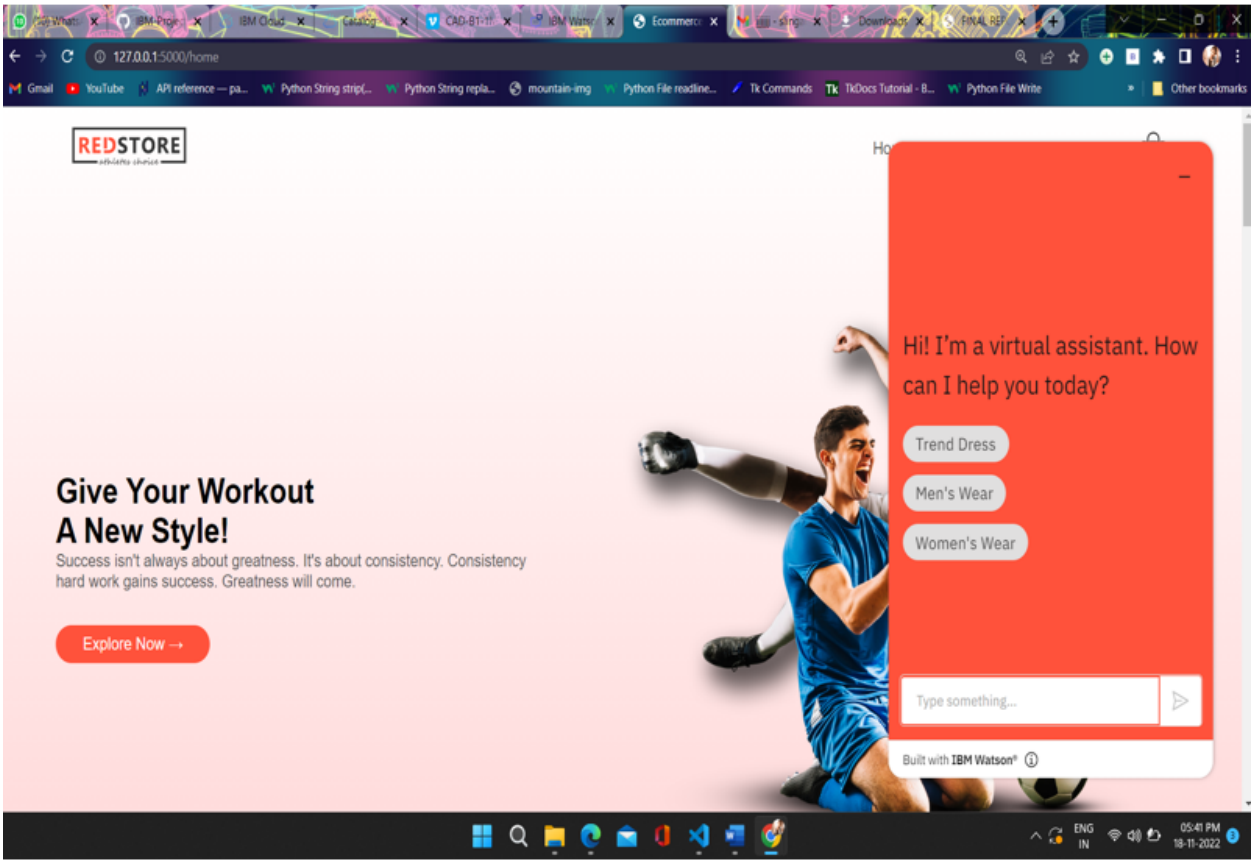

REDSTORE
Home
Products
About
Contact
All Products
Default Shorting
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250
Red Printed T-Shirt
₹250

CHAPTER 8

TESTING

8.1 TEST CASES




127.0.0.1:5000/home
REDSTORE
Give Your Workout
A New Style!
Success isn't always about greatness. It's about consistency. Consistency
hard work gains success. Greatness will come.
Explore Now →
Hi! I'm a virtual assistant. How
can I help you today?
Trend Dress
Men's Wear
Women's Wear
Type something...
Built with IBM Watson®

CHAPTER 9

RESULT

9.1 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 down can be represented as below,

$$RMSE = \sqrt{\frac{1}{N_p} \sum_{u,i} (p_{ui} - r_{ui})^2}$$

where, Np is the total number of predictions, piu is the predicted rating that a user u will select an item I and rue is the real rating. 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 follow:

$$Precision = \frac{True\ Positive\ (TP)}{True\ Positive\ (TP) + False\ Positive\ (FP)}$$

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

$$Recall = \frac{True\ Positive\ (TP)}{True\ Positive\ (TP) + False\ Negative\ (FN)}$$

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:

$$F1\ score = 2 \times \frac{Precision * Recall}{Precision + Recall}$$

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:

CHAPTER 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, very easily 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.
4. Cold-start problem.

CHAPTER 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.

CHAPTER 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 brand-specific 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.

CHAPTER 13

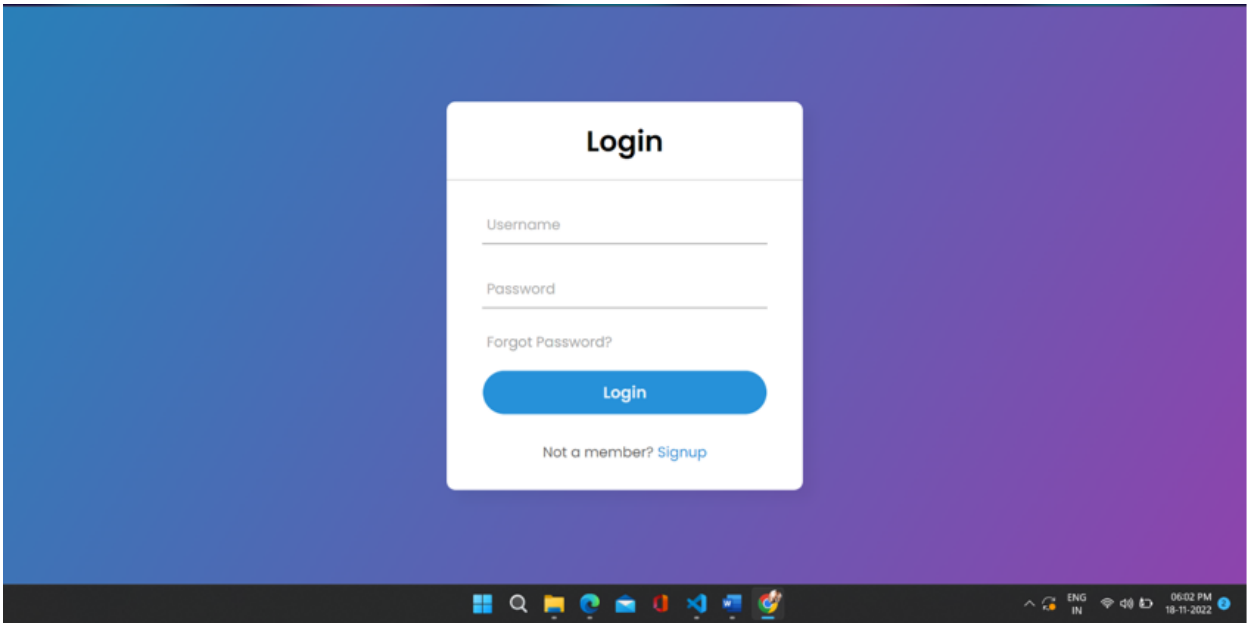
APPENDIX

SOURCE CODE:

SIGNIN:

```
<!DOCTYPE html>
<!-- Coding By CodingNepal - youtube.com/codingnepal -->
<html lang="en" dir="ltr">

<head>
   <meta charset="utf-8">
   <title>Animated Login Form | CodingNepal</title>
   <link rel="stylesheet" href="{{ url_for('static', filename='login.css')}}" />
</head>

<body>
   <div class="center">
      <h1>Login</h1>
      <form method="post">
         <div class="txt_field">
            <input type="text" required>
            <span></span>
            <label>Username</label>
         </div>
         <div class="txt_field">
            <input type="password" required>
            <span></span>
            <label>Password</label>
         </div>
         <div class="pass">Forgot Password?</div>
         <input type="submit" class="id" value="Login">
```

```
            <div class="signup_link">
                Not a member? <a href="/register">Signup</a>
            </div>
        </form>
    </div>
    <script>
        const btn = document.querySelector(".id");
        btn.addEventListener('click', (e) => {
            e.preventDefault();
            window.location.href = '/home';
        })
    </script>
</body>
</html>
from flask import Flask, render_template
app = Flask(__name__)
@app.route('/')
@app.route('/login')
def login():
    return render_template('login.html')
@app.route('/register')
def register():
    return render_template('register.html')
@app.route('/home')
def home():
    return render_template('home.html')

@app.route('/products')
def products():
    return render_template('products.html')
if __name__ == "__main___":
    app.run(debug=True)
```



GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-29871-1660132118

DEMO LINK:

https://youtu.be/XighcLm3_Ko

CHAPTER 14

REFERENCES

❑ GloablInfoResearch: Global Fast Fashion Apparel Market 2021 by Key Countries, Companies, Type and Application. GloablInfoResearch, Hong Kong, 2021.

❑ Hoi, M., Wu, L., Chen, E., Li, Z., Zhen, V. W., & Liu, Q.: Explainable fashion recommendation: A semantic attribute region guided approach. In Proceedings of the 28th Twenty-Eighth International Joint Conference on Artificial Intelligence, 2019; pp. 4681- 4688.

❑ O'Connell, L. (n.d). Topic: Apparel Market Worldwide. Retrieved August 30, 2020,

from https://www.statista.com/topics/5091/apparel- market-worldwide/