Flipkart

GRID
5.0

Problem Statement Title: **Gen-AI Powered Conversational Fashion Outfit Generator**
Team Name: **686157-U9X7B01U**

Team members details

Team Name	686157-U9X7B01U		
Institute Name/Names	Thadomal Shahani Engineering College		
Team Members >	1 (Leader)	2	3
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Batch	March 2025	March 2025	March 2025

Deliverables/Expectations for Level 2 (Idea + Code Submission)

- **Introduction:**
  Overview of the Fashion Outfit Generator project.
  Emphasis on its ability to provide a tailored fashion experience to users.
- **Data-driven Personalization:**
  Utilizing user purchase history for insights into preferred styles, colors, brands, and clothing types.
  Analyzing user behavior like "add to cart" and "likes" to understand user preferences and interests.
- **Incorporating Latest Trends:**
  Leveraging Pinterest data to access the latest fashion trends.
  Ensuring the generated outfits align with current fashion trends.
- **Tailored Recommendations:**
  Consideration of user preferences, body type, age, occasion, and geographic location.
  Ensuring outfit recommendations are relevant and fitting for each user.
- **Diverse Options for Versatility:**
  Guaranteeing a range of outfit options suitable for various occasions and personal tastes.
  Ensuring users have ample choices that cater to their individual style.

- **Image Customization:**
  Introduction of the stable diffusion model for image generation.
  Utilizing control nets to customize images based on user preferences and feedback.
- **Enhanced User Interface:**
  Creation of a Flipkart clone integrated with the model for an intuitive user interface.
  Allowing users to interact effortlessly and find their perfect outfits.
- **Continuous Improvement:**
  Emphasizing the importance of user feedback in refining outfit recommendations.
  Iteratively improving the system's understanding of individual preferences over time.
- **Benefits:**
  Empowering users with personalized fashion choices.
  Keeping users in line with the latest fashion trends.
  Providing versatile options for various occasions and preferences.
- **Conclusion:**
  Summarizing the key components and advantages of the Fashion Outfit Generator.
  Highlighting the system's potential to revolutionize the fashion shopping experience.

Glossary

- LLM – Large Language Model
- GAM- Generative Adversarial Networks
- Gen-Ai – Generative Artificial Intelligence
- DB – Database
- AR – Augmented Reality
- API – Application Programming Interface
- NSFW – Not Safe for Work

Use-cases

- **Use Case 0: General Outfit Suggestion**

<u>User</u>: Jonas, a 17 year old college student, is looking for a daily outfit for college, prefers something comfortable and something that can used multiple times

<u>Solution</u>:-

- The outfit generator looks for multiple images extracted from the internet and analyzes them
- It suggest a general outfit which can worn multiples times and is decently styled
- With slight modifications in the generated outfit based on Jonas' outfit, and Jonas then rated and accepts the outfit

- **Use Case 1: Personalized Everyday Fashion**

<u>User</u>: Emily, a 28-year-old professional, is looking for a casual yet stylish outfit for her office. She prefers earthy tones and comfortable clothing.

<u>Solution</u>:-

- The outfit generator analyzes Emily's past purchases and style preferences.
- It suggests a well-coordinated ensemble comprising a comfortable blouse, tailored trousers, and matching accessories.
- Emily engages in a conversation with the generator, fine-tuning the outfit by swapping the blouse for a slightly different color and adding a statement necklace.

- **Use Case 2: Trendy Evening Attire**

<u>User</u>: David, a fashion-conscious individual, wants a standout outfit for an upcoming evening event. He's keen on staying in line with the latest trends.

<u>Solution</u>:-

- The outfit generator combines David's browsing history with real-time social media trend data.
- It proposes an outfit that harmonizes current fashion trends, including a stylish blazer, bold accessories, and edgy footwear.
- David interacts with the generator, requesting a slight adjustment in footwear style, and receives a revised recommendation.

- **Use Case 3: Special Occasion Ensemble**

<u>User</u>: Priya, a 25-year-old, is attending a traditional Indian wedding and needs an outfit that respects her cultural heritage while embracing modern fashion sensibilities.

<u>Solution</u>:-

- The generator takes into account Priya's age, location, and occasion specifics.
- It suggests an ensemble that blends traditional and contemporary elements, featuring a beautifully embroidered saree, complementing jewelry, and elegant footwear.
- Priya engages in a conversation, swapping the saree for a lehenga choli combination while keeping the overall theme intact.

Solution statement/ Proposed approach

In order to effectively address the challenge of revolutionizing fashion discovery through a Gen AI-powered outfit generator, we have broken down the problem into smaller, manageable sub-problems. Each sub-problem aligns with a key aspect of the overall solution, enabling a comprehensive and systematic approach.
We have divided the problem in 4 subprograms:

- **Sub Problem 1: Personalized Recommendations**

Problem: How can we utilize user's purchase history, style preferences, and brand choices to provide tailored outfit recommendations?
Solution:
- Analyze historical purchase data to identify preferred styles, color choices, and favored brands.
- Employ machine learning algorithms to capture user preferences and trends.
- Leverage GPT-3.5's capabilities to suggest outfits aligned with individual fashion tastes.

- **Sub Problem 2: Data Integration**

Problem: How can we effectively integrate user's past purchase history, browsing data, and social media insights to enhance recommendation accuracy?
Solution:
- Utilize MongoDB for storing and managing user profiles, preferences, and interactions.
- Integrate Selenium WebDriver and Beautiful Soup for web scraping of fashion trends from social media platforms.

- **Sub Problem 3:Interactive User Engagement**

Problem: How can users provide feedback and customize outfits in a conversational manner?
Solution:
- Develop a user-friendly frontend using React.js for seamless interaction.
- Create Flask APIs to facilitate real-time communication between the frontend and backend.
- Integrate GPT-3.5's capabilities to enable users to interact and refine outfits naturally.
- Implement a feedback mechanism to continuously improve the generator's responses.

- **Sub Problem 4:Real-time Trend Analysis**

Problem: How can we stay updated with the latest fashion trends from social media platforms?
Solution:
- Design web scraping algorithms using Selenium and Beautiful Soup to extract trend data.
- Utilize Zilliz Vector DB and Llama Index for efficient storage and querying of trend data.
- Develop algorithms to analyze and categorize trends in real-time.
- Integrate trend insights with user profiles to offer up-to-date outfit recommendations.

In conclusion, our approach to addressing the problem of fashion discovery revolutionization involves breaking down the challenge into several sub-problems. By focusing on personalized recommendations, data integration, interactive user engagement, and real-time trend analysis, we create a robust and comprehensive solution. This approach ensures that our Gen AI-powered outfit generator provides tailored, on-trend recommendations that enhance user satisfaction and confidence in their fashion choices.

Flow of the Project
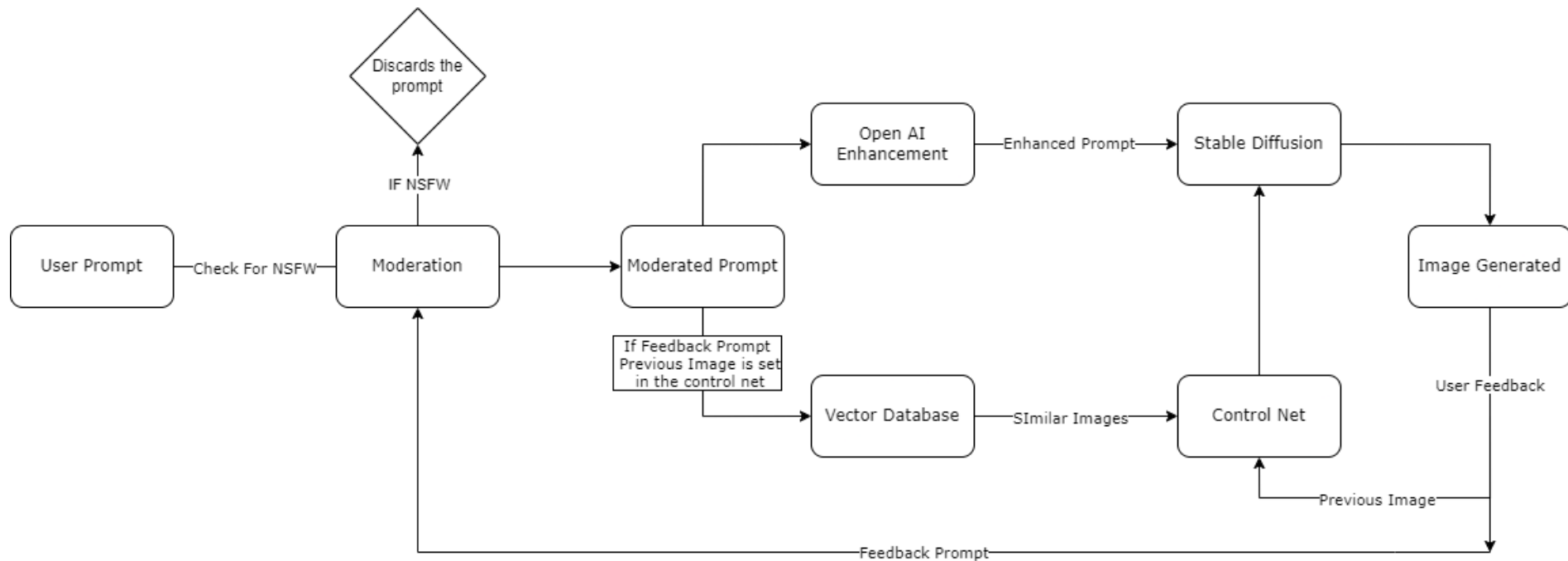
Limitations

- **Dependency on Training Data:** The AI model's accuracy heavily relies on the quality and diversity of training data. Limited or biased data could result in less accurate outfit recommendations.
- **Style and Subjectivity:** While the AI tries to understand user preferences, fashion is highly subjective. The generated outfits might not always align perfectly with the user's unique sense of style.
- **Non-Visual Elements:** The AI primarily generates visual outfits, leaving out other important elements like fabric texture, comfort, and how an outfit feels when worn.
- **Overlooking Cultural Differences:** The AI might not fully comprehend cultural fashion nuances, potentially leading to inappropriate recommendations for certain cultural contexts.
- **Limited Understanding of Occasion:** While the AI considers occasions, it might not fully grasp the user's emotional or personal reasons for wanting a particular outfit.

Future Scope

- **Global Fashion Trends Integration:**
  Integrating AI models to analyze global fashion trends from various sources and provide users with up-to-date outfit recommendations aligned with the latest styles.
- **Virtual Fitting Room:**
  Developing a virtual fitting room where users can see how outfits will look on them using augmented reality (AR) technology, enhancing the online shopping experience.
- **Collaboration with Influencers:**
  Collaborating with fashion influencers to create curated collections and exclusive designs, enhancing the range of outfit choices for users.
- **Cross-Platform Availability:**
  Expanding the application's availability to various platforms, including mobile apps, smart TVs, and wearable devices.
- **User Community and Forums:**
  Creating a community platform where users can share their outfits, fashion inspirations, and tips, fostering engagement and building a fashion-conscious community.