Flipkart

GRID

5.0

Conversational Fashion Outfit Generator powered by GenAI

Team Name: Hax

Team members details

Team Name	Hax		
Institute Name/Names	Shri Vile Parle Kelavani Mandal's Dwarkadas J. Sanghvi College of Engineering		
Team Members >	1 (Leader)	2	3
Name	Rishabh Jain	Devang Shah	Ayush Deshmukh
Batch	2024	2024	2024

Deliverables/Expectations for Level 2

Deliverable title	Expectations
Personalized Outfit Recommendations	Generative AI Algorithm that analyze user preferences, purchase history, color choices, etc. to suggest outfits that align with the user's unique fashion taste.
Conversational User Experience	Allow users to interact naturally with the outfit generator, enabling personalized outfit discovery through conversation.
Trend Analysis	Analyze current fashion trends, styles, influencers, and fashion-related content to ensure that the generated outfit recommendations are up-to-date.
Comprehensive Outfit Suggestions	Encompass a ensemble recommender, including clothing, accessories, footwear, and other relevant items.
Adaptation to User Characteristics	Develop algorithms that consider various user attributes such as body type, occasion, age, region, and cultural context while suggesting.
User Interaction and Feedback	Allow users to provide feedback on individual components of the outfit and requesting modifications.

Glossary

Keyword	Definition
LLM	Large Language Model
GPU	Graphics Processing Unit
NER	Named Entity Recognition
API	Application Programming Interface
UI	User Interface
JS	JavaScript
NLP	Natural Language Processing
ML	Machine Learning
DB	Database

Use-cases

ENHANCED SHOPPING EXPERIENCE
Offers personalized and trendy outfit ideas. Users feel inspired and confident in their fashion choices.

INTERACTIVE
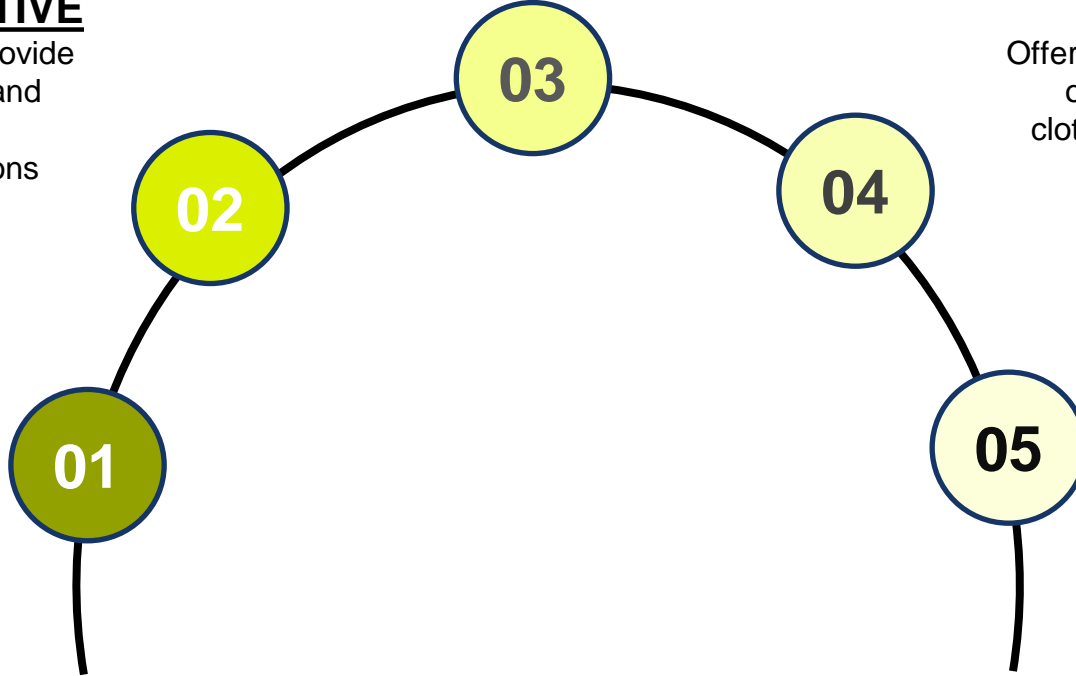Users can provide feedback and request modifications

COMPLETE
Offer complete & coordinated outfit ideas, including clothing, accessories, and footwear.

PERSONALISED
Analyzes user's past purchase/browse history, color choices, preferred brands, etc.

SPECIFIC
Recommender consider specifications such as age, gender, body type, etc.

01

02

03

04

05

Proposed approach

DATASET PREPARATION

- Used [Fashion Products Dataset available on Kaggle](#)
- Dataset consists of 44000+ fashion products
- It includes accessories, apparels, footwear, personal care items
- Attributes include id, product title, gender, category, article type, colour, season, type of wear, images, etc.
- Feature Engineering to extract relevant features and to safeguard the data from being directly learned by AI.

LOADING TO DATABASE

- Pre-processed data is loaded into PyMongo for easy retrieval.
- DistilRoberta-v1 is used as a sentence transformer to create vector embeddings of dimension 768
- The embeddings along with ids are stored on Pinecone Vector DB for querying.
- Metrics used is cosine similarity
- Feature Engineering to extract relevant features from dataset which included title, gender, category, article type, etc

Proposed approach

LARGE LANGUAGE MODEL

- Instead of using any priced API, we built a custom eCommerce Chatbot using pre-trained models.
- Base model used was Falcon-7B
- Loaded and trained on Kaggle GPU-P100.
- Prompt engineering techniques to identify the correct prompt template.
- From the Kaggle GPU instance, expose LLM API using Flask-ngrok
- Based on user query, program returns top fashion product titles
- Unlimited number of queries can be done, unlike any APIs.

SOCIAL MEDIA TRENDS

- Built scrappers for Instagram, Twitter and also used Pytrends.
- Trending fashion hashtags were prompted to LLM, which returned specific product keywords

USER TRAITS

- User specific personalities such as age, gender, body-type, size, fit are considered by us.
- Semantic search on a vector DB storing Rent-the-runway fashion dataset embeddings returns necessary keywords.

Proposed approach

SIMILAR PRODUCT SEARCH

- Extract attributes from the user's query using NER.
- LLM to find similar product title & keywords which will be search terms for finding similar products.

PRODUCT QUERY & RETREIVAL

- Query Pinecone Vector DB using search terms.
- Retrieve JSON objects containing all details about the matching products FROM PyMongo
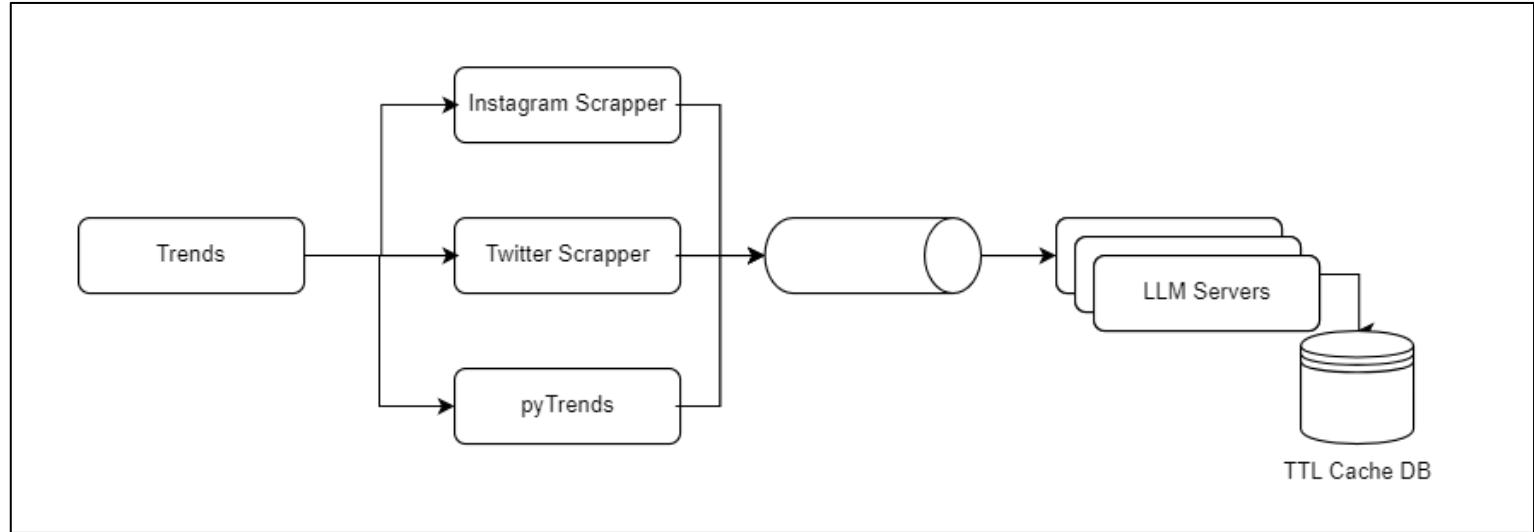
APPLICATION DEVELOPMENT

- Developed interactive & attractive eCommerce interface using ReactJS, Redux
- Allows user to view product information, add to cart and checkout
- Backend API services built using Flask and python
- Based on user query, program returns top fashion product titles
- Very fast retrieval of recommendations.
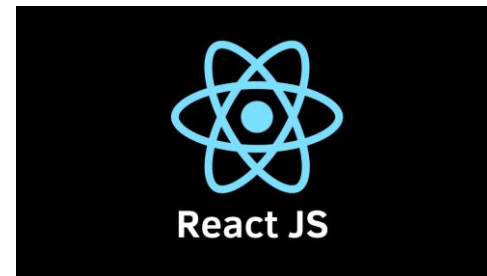
Proposed approach
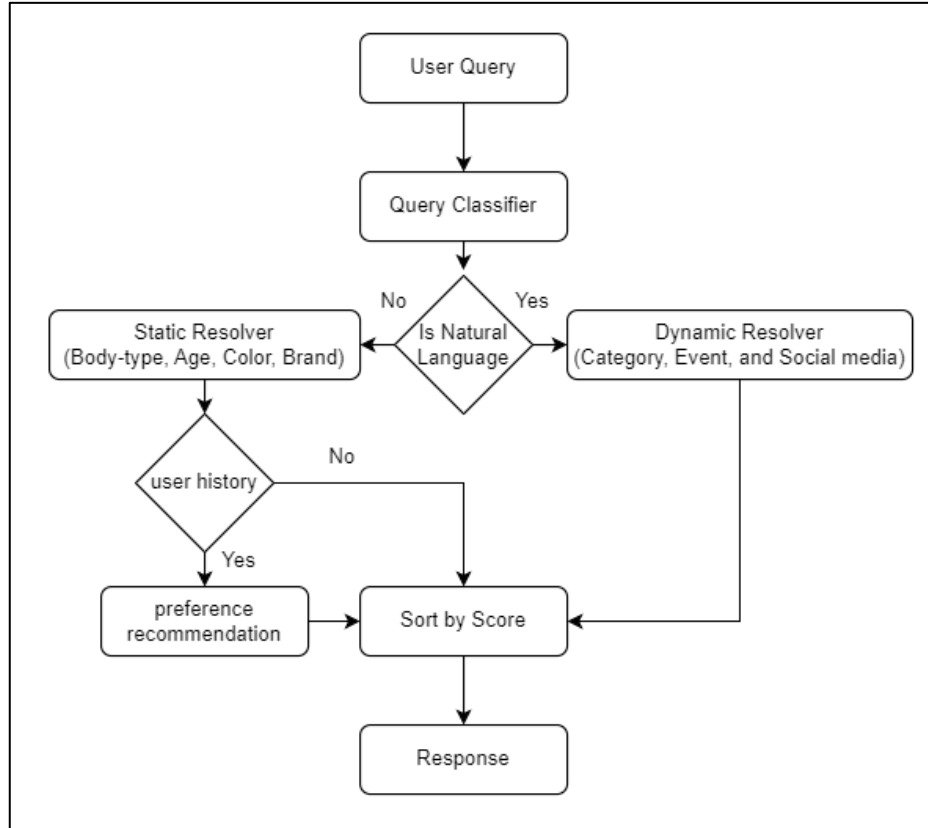
Flow-Chart - **USER QUERY**

Proposed approach

Flow-Chart – **SOCIAL MEDIA TRENDS ANALYSIS**

Technology Stacks

python™

PINECONE

PyMongo

React JS

ngrok

n*de
JS

🤗 Hugging Face

Flask

alicekwak
/TN_all-distilroberta-v1

Redux

mongoDB

Applications

1. Personalized Fashion Shopping: Users can receive tailored outfit recommendations based on their preferences, body type, and style. This can greatly enhance the shopping experience, saving time and increasing user satisfaction.

2. **Trend Forecasting and Analysis:** By analyzing social media trends and user preferences, the system can provide insights into emerging fashion trends, helping brands and designers stay ahead of the curve.

3. **Fashion Styling Platforms:** The project could be extended to provide fashion styling services, where users interact with AI stylists to create outfits for specific occasions or events.

4. **Virtual Wardrobes:** Users can virtually view different outfits and combinations before making a purchase, helping them visualize how items will look together.

5. **Event-Specific Outfits:** Generate outfit suggestions tailored to specific events, occasions, and cultural norms, ensuring users choose the perfect attire for any situation.

7. **Brand Engagement and Product Discovery:** Brands can use the system to engage with users, recommend their products, and help users discover new items that match their preferences.

8. **Data-Driven Marketing Campaigns:** Brands can utilize insights from user preferences and trends to create targeted marketing campaigns that resonate with their audience.

9. **Body Positivity and Inclusivity:** The project can promote body positivity by recommending outfits that flatter different body types and sizes.

10. **Sustainable Fashion Choices:** The AI can suggest sustainable fashion options, promoting eco-friendly choices in clothing and accessories.

Limitations

Limitations

Probable Solutions

01 **Inability to Mimic Human Interaction:**
Requires high level of creativity, empathy and context understanding

01 **Hybrid Approach:**
Here, AI-generated suggestions are refined by human stylists or designers.

02 **Lack of User Feedback Interpretation:**
Users don't have ultimate freedom to modify the recommendations based on past chat history

02 **Preserve Chat History:**
Iterative feedback loop where user's feedback are used to refine the AI model over time.

03 **Hardware Cost and Compatibility:**
Our LLM requires GPU (specialized hardware) which consumes more energy and is complex.

03 **Cloud:**
Clous-based GPU that allow pay-as-you-use, or collaborate with cloud providers.

Future Scope

Multi-Lingual Support
Support multiple accents and diverse linguistic backgrounds

Augmented Reality Integration
Allow users to virtually try-on recommended outfit

ML for Style Evolution
ML model that adapts based on user feedback and conditions

Sustainability & Ethical Fashion
Suggest eco-friendly & ethically produced clothing items

Outfit-Wishlist Sharing
Allow users to share their preferred wish lists