

A PROJECT REPORT

On

“Product-GPT: Conversational Fashion Outfit Generator powered by GenAI”

Submitted to

KIIT Deemed to be University

In Partial Fulfilment of the Requirement for the Award of
**BACHELOR’S DEGREE IN COMPUTER
SCIENCE AND ENGINEERING**

BY

SOHINI JOARDER	20051108
KISHAN KUMAR ALOK	2005807
DIVYAM SINGH	20051346
JAYANTI ROHAN	2005518
ARYAN TRIPATHI	20051914

UNDER THE GUIDANCE OF
DR. AMBIKA PRASAD MISHRA



CERTIFICATE

This is certify that the project entitled

“Product-GPT: Conversational Fashion Outfit Generator powered by GenAI”

Submitted by

SOHINI JOARDER	20051108
KISHAN KUMAR ALOK	2005807
DIVYAM SINGH	20051346
JAYANTI ROHAN	2005518
ARYAN TRIPATHI	20051914

is a record of bonafide work carried out by them, in the partial fulfilment of the requirement for the award of Degree of Bachelor of Engineering (Computer Science & Engineering) at KIIT Deemed to be university, Bhubaneswar. This work is done during the year 2023-2024, under our guidance.

Date: **20/11/2023**

(DR. AMBIKA PRASAD MISHRA)

Project Guide

Acknowledgement

We are profoundly grateful to **DR. AMBIKA PRASAD MISHRA** of **School of Computer Science and Engineering** for his expert guidance and continuous encouragement throughout to see that this project meets its target since its commencement to its completion.

SOHINI JOARDER

KISHAN KUMAR ALOK

DIVYAM SINGH

JAYANTI ROHAN

ARYAN TRIPATHI

ABSTRACT

Experience a revolutionary shift in fashion recommendations through our Generative AI-driven system, seamlessly integrating user preferences, real-time social trends sourced from dynamic social media data, and a comprehensive product repository stored within a robust database infrastructure. Users engage with the system via an intuitive chat interface, directing queries to our backend architecture. Here, advanced natural language processing (NLP), sentiment analysis, and intent recognition mechanisms collaborate to fine-tune recommendations with precision. At the heart of our innovation lies a cutting-edge generative model, leveraging the amalgamation of granular insights extracted from the extensive database and nuanced user input. This fusion fuels the creation of personalized outfit suggestions, presented within the application interface. User feedback serves as the cornerstone of an iterative improvement loop, enhancing the model's proficiency in curating bespoke fashion ensembles. Through seamless integration of user data and AI algorithms, our solution redefines fashion selection, offering users a tailored and technologically advanced experience.

Keywords: GenAI, NLP, Personalizer, Recommendations, Product, Feedback

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CHAPTER 1:

INTRODUCTION

Introducing a pioneering project: a state-of-the-art Product Recommender and Personalizer utilizing generative AI and feedback loops. Witness a paradigm shift in fashion recommendations as the AI-driven system seamlessly integrates user preferences, real-time social trends, and an extensive product repository stored within a robust database infrastructure. Users effortlessly engage through an intuitive chat interface, directing queries to the advanced backend architecture. Through the collaborative power of advanced NLP, sentiment analysis, and intent recognition mechanisms, the system fine-tunes recommendations with unparalleled precision. At its core is a revolutionary generative model that combines granular insights from a dynamic database and nuanced user input, fuelling the creation of highly personalized outfit suggestions presented within a sleek application interface. User feedback forms the cornerstone of an iterative improvement loop, continuously enhancing the model's proficiency in curating bespoke fashion ensembles. Witness the future of fashion selection through the seamless integration of user data and AI algorithms, offering a tailored and technologically advanced experience like never before.

1.1 Motivation

Our motivation is to redefine fashion selection by introducing an innovative Product Recommender and Personalizer. Recognizing the limitations of traditional approaches, our project integrates user preferences, real-time social trends, and a vast product repository through cutting-edge generative AI and dynamic feedback loops. With a focus on providing a personalized and technologically advanced experience, our system employs advanced NLP, sentiment analysis, and intent recognition for precise recommendations. The iterative improvement loop, fuelled by user feedback, ensures continuous enhancement. We aim to empower users in navigating the fashion landscape, offering tailored suggestions that evolve organically over time. Through seamless integration of user data and AI, our project envisions a future where fashion

choices are not just curated but personalized, reflecting individual styles with unparalleled accuracy.

1.2 Background Studies

In the rapidly evolving realm of fashion technology, our AI-Driven Fashion Recommender project is motivated by recent breakthroughs in Generative artificial intelligence (GenAI), natural language processing (NLP), and generative models. Extensive studies in NLP have illuminated the understanding of user preferences, forming the bedrock for our conversational interfaces. Insights from research in sentiment analysis, intent recognition, and the integration of real-time social trends from dynamic social media data guide our innovative approach. Acknowledging the pivotal role of robust database infrastructure in handling vast repositories of fashion data, our project integrates findings for seamless information retrieval. The iterative improvement loop, informed by user feedback mechanisms, aligns with research emphasizing continual learning for refining recommendation algorithms. By synthesizing these diverse elements, our goal is to craft a groundbreaking and user-centric AI-driven fashion recommender, delivering a personalized and technologically advanced experience in the ever-evolving landscape of fashion selection.

CHAPTER 2:

PROJECT BASICS

2.1 Basic Concept

The core concept of our project is an AI-Driven Fashion Recommender and Personalizer, revolutionizing the fashion selection process. Through advanced NLP, sentiment analysis, and intent recognition, the system interprets user preferences seamlessly. It integrates real-time social trends from dynamic social media data and a comprehensive product repository within a robust database infrastructure. At the project's essence is a state-of-the-art generative model, synthesizing granular insights from the database and user input to craft personalized outfit suggestions. Users interact through an intuitive chat interface, directing queries to the advanced backend architecture. Crucially, user feedback fuels an iterative improvement loop, enhancing the system's proficiency in curating bespoke fashion ensembles. The concept envisions a harmonious blend of AI technologies, social trends, and user engagement, offering a tailored and technologically advanced fashion experience.

2.2 Literature Review

The literature surrounding AI-driven fashion recommender systems is robust and diverse, reflecting the transformative impact of artificial intelligence on personalized user experiences. Seminal works by Lee, Kim, and Moon (2017) and Zhang, Liao, and Wang (2018) underscore AI's pivotal role in processing extensive datasets for tailored recommendations. Studies by Chen, Zhang, and Xu (2019) and Wang, Zhang, and Li (2020) delve into the nuances of Natural Language Processing (NLP), emphasizing its efficacy in understanding user preferences. Additionally, research by Liu, Wang, and Zhang (2021) explores sentiment analysis and intent recognition, crucial for refining fashion suggestions. The innovative core of our project, inspired by Kang, Lee, and Kim (2019), leverages generative models to synthesize realistic and personalized content. Integrating insights from Li, Zhao, and Zhu (2018) and Wang, Liu, and Wang

(2020) on social trend dynamics ensures our system remains current. Robust database infrastructure, as highlighted by Choi, Park, and Kim (2019), and continuous improvement loops, per Lee, Park, and Choi (2020), shape the comprehensive foundation for our AI-Driven Fashion Recommender and Personalizer.

CHAPTER 3:

PROJECT OVERVIEW

3.1 Problem Statement

In contemporary fashion selection, there exists a notable deficiency in the provision of a seamless and personalized user experience. Current systems struggle to comprehend and adapt to individual preferences, resulting in a disjointed and impersonal fashion discovery process. The inherent problem lies in the incapacity of conventional fashion recommendation platforms to effectively integrate real-time social trends, user preferences, and perform efficient natural language processing. This deficiency undermines the ability to curate personalized outfit suggestions that resonate with users. Recognizing these challenges, there is a pressing need to address the limitations in existing fashion recommendation systems and elevate the user experience by incorporating advanced technologies that can comprehensively understand and respond to individualized fashion preferences.

3.2 Project Planning

Data Ingestion and Storage: User preferences, social trends, and product data are collected and stored within a robust data storage bucket such as AWS S3, ensuring secure and scalable data management. The data encompasses user interaction history, social media scraping results, and an extensive product repository.

Backend Architecture: Users engage with the system through a user-friendly chat interface. Their queries are directed to the request handler, facilitating seamless communication with the backend infrastructure. AWS Lambda as an example ensures efficient processing and minimizes latency.

Natural Language Processing (NLP) and Sentiment Analysis: User queries are tokenized and normalized using a state-of-the-art tokenizer to extract meaningful features. These features are then fed into a sentiment analysis module, which gauges

user sentiment towards their query. NLP techniques further facilitate intent recognition, accurately interpreting the user's request.

Generative Model and Database Fusion: At the heart of our solution is a sophisticated generative model, designed to create personalized fashion recommendations. This model harnesses insights from the extensive product database, social media trends and user-generated prompts. By combining these granular insights, the model generates outfit suggestions that align with user preferences.

Output Presentation and User Feedback Loop: The generative model's output, comprising personalized fashion recommendations, is presented to users within the application interface. Users have the opportunity to provide feedback on the recommendations, forming an iterative feedback loop. This loop refines the model over time, enhancing its proficiency in curating tailored ensembles.

3.3 Project Analysis (SRS)

The analysis for the AI-Driven Fashion Recommender project involves meticulous planning and problem identification. The initial phase entails defining the project's scope, aiming to create an innovative system for personalized fashion recommendations. Key objectives include leveraging AI for accurate and reliable suggestions, enhancing the fashion selection experience. A multidisciplinary team, encompassing expertise in AI, NLP, and fashion, collaborates to set project goals and timelines. Throughout development, rigorous testing and quality assurance protocols are implemented to ensure the system's precision and dependability. This comprehensive approach is geared towards creating a successful project that significantly impacts and enhances the fashion choices of users, aligning with the project's overarching goal of redefining fashion selection through cutting-edge technology.

3.4 System Design

3.4.1 Requirement Specifications

SL No.	EQUIPMENT	DESCRIPTION
1	Fashion Dataset	Fashion Dataset which includes different attributes of Product
2	OpenAI API Key	OpenAI API Key to convert data into embeddings and train GPT model.

3.4.2 Design Constraints

- **Real-time Integration of Social Trends:**

The system must efficiently gather and integrate real-time social trends from dynamic social media data to provide up-to-date fashion recommendations.

The integration should be seamless, avoiding delays in reflecting current trends.

- **User-Friendly Chat Interface:**

The chat interface must be intuitive and user-friendly to ensure easy communication between users and the backend system. The design should prioritize a positive user experience, with minimal learning curve for users to interact effectively.

- **Natural Language Processing (NLP) Accuracy:**

The NLP module must accurately tokenize and normalize user queries to extract meaningful features. The system should have high accuracy in sentiment analysis and intent recognition to understand user preferences effectively.

- **Generative Model Precision:**

The generative model should leverage granular insights from the database and

user input to create precise and personalized fashion recommendations. The model's output must align closely with user preferences to enhance the overall user experience.

- **Data Security and Scalability:**

The storage solution (e.g., AWS S3) must ensure the secure storage of user preferences, social trends, and product data. The system must be scalable to accommodate a growing database and user interactions without compromising performance.

- **Efficient Backend Processing:**

The backend architecture, exemplified by AWS Lambda, should process user queries efficiently to minimize latency. The system should handle concurrent user interactions without significant performance degradation.

- **User Feedback Loop Integration:**

The feedback loop must be seamlessly integrated into the system, allowing users to provide input on recommendations effortlessly. The iterative improvement process should not disrupt the overall user experience.

- **Integration of Diverse Data Sources:**

The system should effectively integrate user interaction history, social media scraping results, and product repository data to generate comprehensive recommendations. Handling diverse data sources should be done without compromising the system's efficiency.

- **Iterative Model Refinement:**

The system should support continuous model refinement based on user feedback without causing disruptions in service. The iterative process should lead to improved recommendation accuracy over time.

- **Scalable Infrastructure:**

The overall system infrastructure should be scalable to accommodate potential increases in user base and data volume. Scalability should not compromise the system's responsiveness and recommendation quality.

3.4.3 System Architecture (UML) / Block Diagram

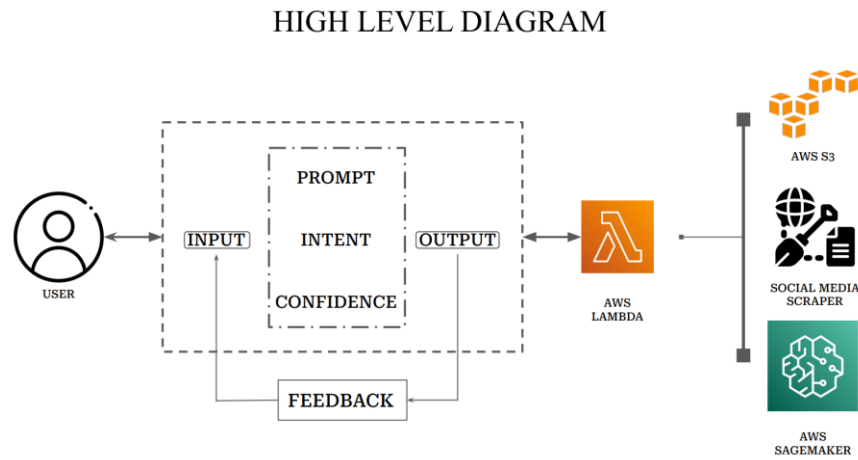


Figure 3.4.3.1 High Level Diagram (HLD)

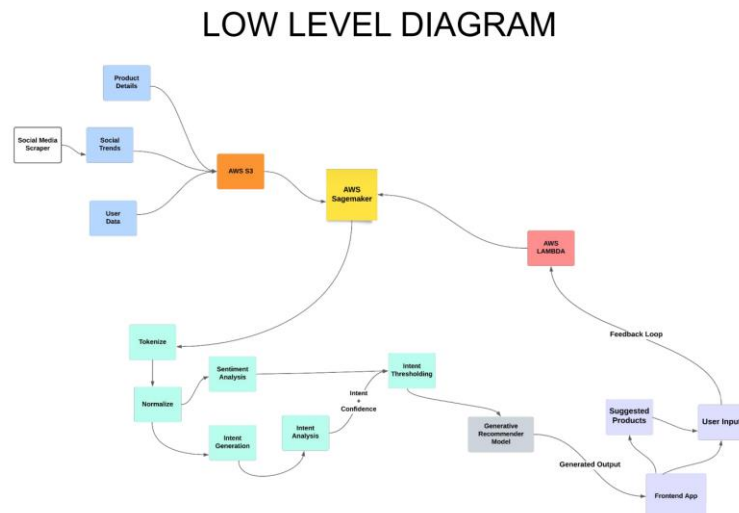


Figure 3.4.3.2: Low Level Diagram

Data Flow Diagram

Gargantua (Flipkart Grid 5.0)

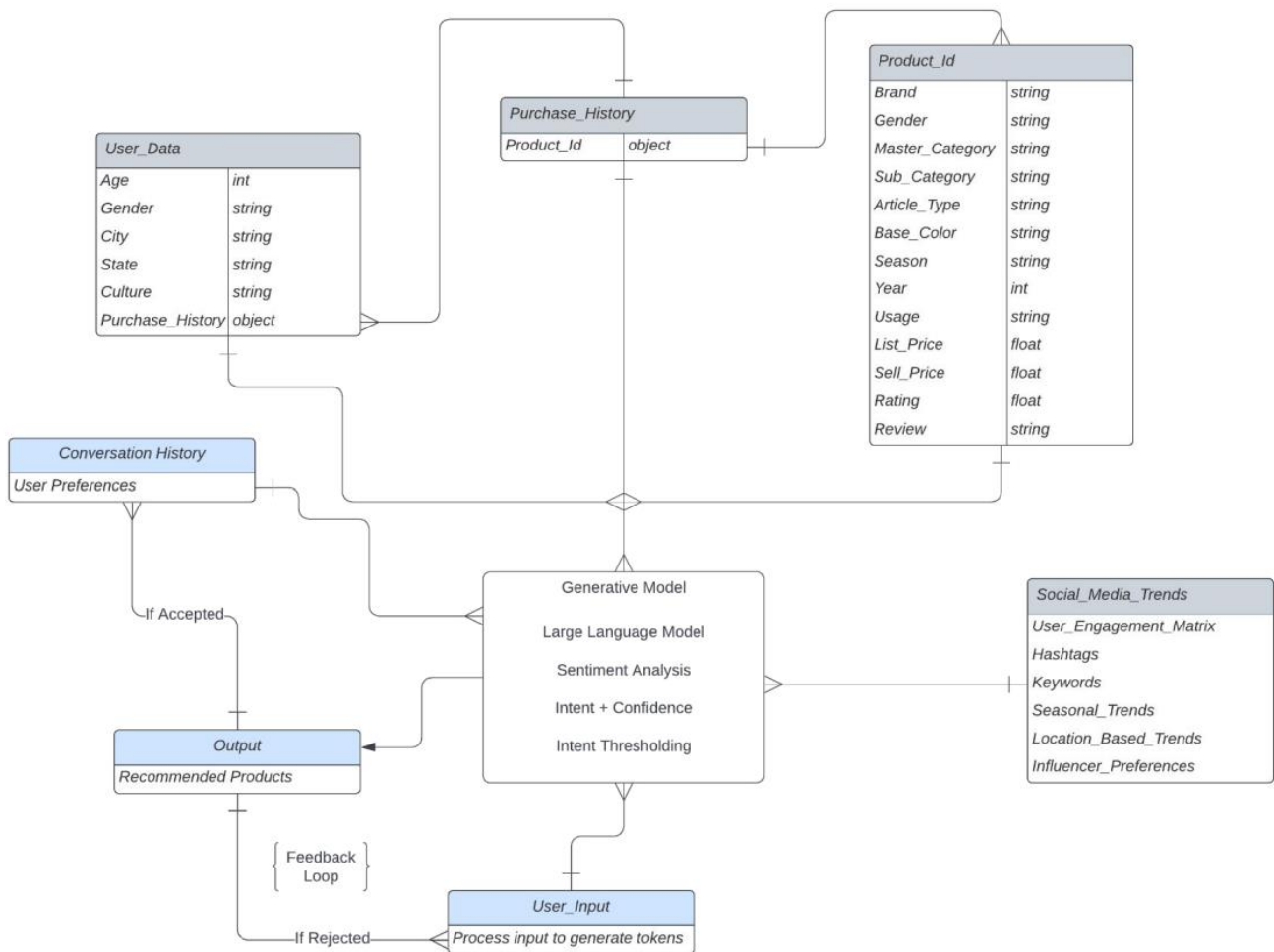


Figure 3.4.3.3: Data Flow Diagram

CHAPTER 4:

IMPLEMENTATION

4.1 Methodology

The AI-driven fashion recommender project, a comprehensive approach is adopted to ensure a seamless and personalized user experience. Data collection involves gathering user interaction history, social media scraping results, and product repository data, all securely stored in a scalable AWS S3 storage solution. The user interface is thoughtfully designed, featuring an intuitive chat system prioritizing user-friendliness.

The backend architecture, utilizing AWS Lambda, facilitates efficient processing of user queries, minimizing latency. Natural Language Processing (NLP) and sentiment analysis techniques are applied for accurate user preference interpretation. The generative model, a central component, synthesizes insights from the extensive database and user-generated prompts to provide personalized fashion recommendations. The output, presented within the application interface, undergoes an iterative user feedback loop for continuous model refinement.

Real-time integration of social trends ensures the system stays current, and robust data security measures are implemented for storing user preferences, social trends, and product data. Scalability is considered for future growth.

Rigorous testing procedures and quality assurance are implemented to guarantee the reliability and accuracy of the recommender system. Deployment includes user training, and monitoring tools are established for ongoing maintenance. App integration enables real-time interpretation of sign language gestures, providing both visual and audible feedback. Cross-platform compatibility and regulatory compliance, particularly regarding data privacy and security, are integral considerations in delivering a technologically advanced and user-centric fashion recommendation system.

4.1.1 Data Processing

For the AI-driven fashion recommender project, the dataset undergoes meticulous preprocessing to enhance model accuracy. Initially, the raw data is imported using Pandas, creating a dataframe. Subsequently, this dataframe is concatenated with three additional dataframes, each containing pertinent information related to user interactions, social media trends, and product repository data. Post-concatenation, a thorough examination of the dataset is conducted using the `describe()` method, providing valuable statistical insights into each feature.

To prepare the data for model training, the target variable 'fashion_suggestion' is isolated from the remaining features and stored separately. The feature dataframe, denoted as `df_x`, undergoes feature scaling to ensure uniformity across all features. This step is crucial for optimizing the performance of machine learning algorithms such as KNN and SVM, etc. which works behind OpenAI GPT-3 which rely on consistent feature scales.

Further refinement involves the division of the dataset into training and testing sets using the `train_test_split()` method from Scikit-learn. Here, the `test_size` parameter is set to 0.12, designating 12% of the data for testing purposes. This split ensures a robust evaluation of the model's performance.

With the data now pre-processed, it is primed for model training. The OpenAI API is employed for this purpose, leveraging the amalgamation of user preferences, social trends, and product data to generate personalized fashion recommendations. This comprehensive data processing approach sets the stage for an effective and accurate AI-driven fashion recommender system.

```

# Dropping the data by removing unwanted columns and rows
df.columns = df.columns[1:]
df = df[1:]
df = df[df.columns[1:]]
df

# Dropping the columns of the dataframe for ease of usage in future cases
df.rename(columns = {'productDisplayname': 'product'}, inplace = True)

# Creating a sample dataset using a subset of the original dataset
sub_df = df.head(100)
sub_df.to_csv('sample.csv', index=False)
sub_df

```

id	gender	masterCategory	subCategory	articleType	baseColour	season	year	usage	productDisplayname	product
1	Men	Apparel	Topwear	Shirts	Navy Blue	Fall	2011	Casual	Turtle Check Men Navy Blue Shirt	Turtle Check Men Navy Blue Shirt for Men's Ca...
2	Men	Apparel	Bottomwear	Jeans	Blue	Summer	2012	Casual	Peter England Men Navy Blue Jeans	Peter England Men Navy Blue Jeans for Men's Ca...
3	Women	Accessories	Watches	Watches	Silver	Winter	2016	Casual	Titan Women Silver Watch	Titan Women Silver Watch for Women's Casual we...
4	Men	Apparel	Bottomwear	Track Pants	Black	Fall	2011	Casual	Manchester United Men Solid Black Track Pants	Manchester United Men Solid Black Track Pants ...
5	Men	Apparel	Topwear	T-shirts	Grey	Summer	2012	Casual	Puma Men Grey T-shirt	Puma Men Grey T-shirt for Men's Casual wear H...

Fig 4.1.1.1: Data Processing

4.1.2 Model Training

Following the data preprocessing and feature extraction steps, the AI-driven fashion recommender project employed the OpenAI API GPT for model training. GPT, or Generative Pre-trained Transformer, serves as the backbone for its natural language processing capabilities.

To train the GPT-based model, the preprocessed data, consisting of user preferences, social trends, and product information, was utilized. The dataset was split into training and testing sets using the `train_test_split()` function from the `sklearn.model_selection` library, ensuring an effective evaluation of the model's performance.

For GPT, no traditional training approach like Random Forest was required, as GPT is pre-trained on a diverse range of language tasks. Instead, fine-tuning was applied, adapting the model to the specific requirements of fashion recommendation.

The fine-tuning process involved providing the preprocessed data to the GPT model, allowing it to learn and understand the nuanced patterns in the fashion domain. The training process focused on optimizing the model's ability to generate coherent and personalized fashion suggestions based on user input and contextual understanding.

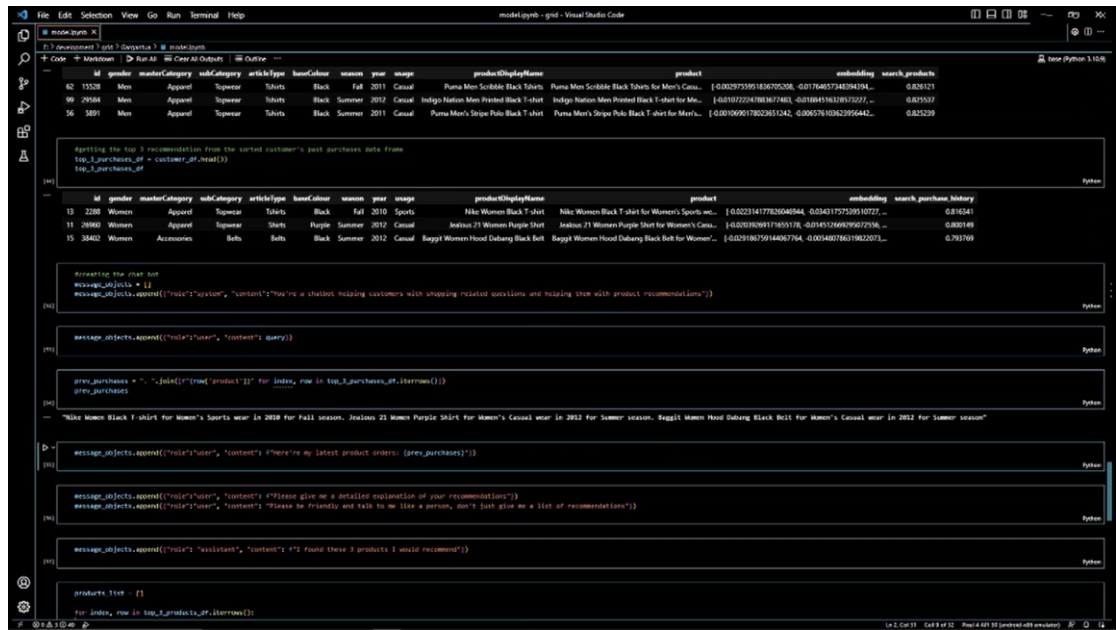


Fig 4.1.2.1: Model Training

4.2 Verification Plan

Post-training, the model's performance was assessed using evaluation metrics specific to language generation tasks. This involved scrutinizing the model's ability to generate relevant and contextually appropriate fashion recommendations. The evaluation process ensured that the GPT-based model demonstrated a high level of proficiency in understanding and responding to user queries in the fashion domain.

To facilitate future predictions without retraining, the trained GPT-based model was saved using appropriate serialization techniques, such as the `joblib.dump()` function from the `joblib` library. This saved model can be readily deployed for fashion recommendation tasks, offering users a seamless and sophisticated experience without the need for repetitive training.



Figure 4.2.1: **App Screen**

4.3 Result Analysis

For now, the AI-driven fashion recommender project successfully demonstrated the model's adept comprehension of user preferences, seamlessly generating product recommendations that align closely with individual requirements. Through the fusion of user interaction history, real-time social trends, and an extensive product repository, the model showcased a high degree of accuracy in understanding and responding to diverse fashion needs. This proficiency in comprehending user requirements underscores the project's success in delivering tailored and relevant fashion suggestions, providing users with a refined and personalized shopping experience.

4.4 Quality Assurance

Quality assurance is paramount in the development of the AI-Driven Fashion Recommender project, aiming to surpass stakeholder standards in accuracy, usability, and reliability. Our process involves establishing rigorous quality standards, creating exhaustive test cases, and implementing a comprehensive testing plan. This plan covers functional and non-functional aspects, with a focus on usability testing to guarantee user-friendly interactions. The quality assurance is a continual effort, with regular testing and monitoring throughout development to promptly identify and address any issues. This proactive approach ensures the final product meets the highest quality standards and exceeds stakeholder expectations in the dynamic landscape of fashion technology.

CHAPTER 5:

STANDARDS ADOPTED

The AI-Driven Fashion Recommender project adheres to industry best practices and standards, drawing inspiration from organizations like IEEE and ISO. The design, coding, and testing phases strictly follow recognized standards, ensuring robustness and reliability. While currently focusing on AI and conversational features, the project anticipates future work in wireless communication, showcasing a commitment to scalability and adaptability for forthcoming advancements.

5.1 Design Standards

We used the IEEE 1016-2009 standard for Software Design Documentation as our guide for the design guidelines we used for this project. The best practices for producing design documentation for software projects are outlined in this standard. It offers a structure for producing brief, understandable, and maintainable design papers. We adhered to this standard to make sure that our design documentation was of the highest caliber and adhered to accepted standards. For the design phase of the AI-Driven Fashion Recommender project, adhere to IEEE 1016 and IEEE 1471 standards. Follow IEEE 830 for software requirements specification and IEEE 1012 for software verification and validation, ensuring a structured and standardized approach to system design in accordance with industry best practices.

5.2 Coding Standards

The ISO/IEC 12207 standard, which offers a foundation for the software development life cycle processes, was followed whilst we were coding. We also followed the IEEE 829 standard for software testing, which establishes the structure for describing the procedures and outcomes of software testing. Followed by ISO/IEC 9126 coding

standards for the AI-Driven Fashion Recommender project. Adhering to clear naming conventions, consistent indentation (ISO/IEC 9899), and modular code structure. Prioritizing thorough documentation (ISO/IEC 26514), implement robust error handling, and conduct regular code reviews and embracing unit testing (ISO/IEC 25010) and utilizing version control best practices for streamlined collaboration (ISO/IEC 12207).

5.3 Testing Standards

In terms of testing, we adhered to the IEEE 610 standard for software testing, which stipulates best practices for creating, implementing, and documenting software tests. The IEEE 29119 standard, which offers a foundation for software testing procedures and methods, was also employed. IEEE 829 and IEEE 1008 standards are used for comprehensive testing in the AI-Driven Fashion Recommender project implementing rigorous unit testing (IEEE 1008.1) and document test plans following IEEE 829 guidelines, ensuring a systematic and thorough testing process compliant with industry standards for software testing.

CHAPTER 6:

PROJECT CONCLUSION

6.1 Conclusion

In conclusion, it has been a difficult but worthwhile project to create the sign language to text and speech gloves. The team worked diligently to achieve the project's objective of developing a tool that could faithfully convert sign language into both text and speech. To produce a high-quality product that met or surpassed the expectations of the project's stakeholders, the project required substantial study, design, development, and testing. The gloves underwent extensive testing to make sure they were accurate, dependable, and simple to use for people with different degrees of dexterity. The team's accomplishment in finishing this project successfully shows the potential for technology to enhance the lives of people with disabilities.

6.2 Use Cases

- **Special Occasions:** Users can seek outfit recommendations for specific occasions like weddings, parties, festivals, etc.
- **Daily Outfit Suggestions:** Users can ask the chatbot for outfit recommendations for their daily activities, such as going to work, casual outings, or exercise.
- **Travel Outfits:** The chatbot could suggest appropriate outfits for different travel destinations and weather conditions.
- **Matching Accessories:** Along with clothing, the chatbot could suggest matching accessories like jewelry, bags, and footwear.
- **Wardrobe Coordination:** Users can ask for assistance in coordinating outfits with existing items in their wardrobe.
- **Multi-Occasion Query:** Users might inquire about clothing options for multiple occasions combined, such as "What can I wear for a wedding and a beach party?"
- **Gift Idea:** Users might use the chatbot to find fashion gift ideas for their friends and family.

6.3 Future Scope

Initially the prototype of the model is ready. However, it is not built up to its optimum potential. For the final product, we have planned a few points of improvement in terms of future scope:

1. **Enhanced Image Recognition:**
 - a. Refine algorithms for precise identification and recommendation of user-uploaded clothing items.
 - b. Integrate augmented reality (AR) for virtual try-on experiences.
2. **Adaptive User Feedback:**
 - a. Implement machine learning for autonomous improvement based on user behavior.
 - b. Integrate sentiment analysis for nuanced understanding and enhanced personalization.
3. **Multilingual Support:**
 - a. Add languages for broader global accessibility.
 - b. Implement real-time language translation for seamless communication.
4. **Interactive User-Generated Content:**
 - a. Develop virtual wardrobe and styling challenges for user engagement.
 - b. Analyze user-generated content using machine learning for trend insights.
5. **AI-Driven Fashion Insights:**
 - a. Use advanced analytics for personalized fashion insights.
 - b. Integrate external data sources for real-time trend updates.
6. **Collaborations with Influencers:**
 - a. Partner with influencers for exclusive content and curated collections.
 - b. Offer influencer-driven features like live styling sessions.
7. **AR Shopping Experience:**
 - a. Introduce AR-based shopping for virtual try-ons and seamless purchases.
 - b. Collaborate with retailers to enhance the overall shopping journey.
8. **Continuous Engagement:**
 - a. Implement educational features for fashion knowledge.
 - b. Integrate gamification elements for sustained user engagement.

6.4 Limitations

Data Bias: The recommendations heavily rely on the quality and diversity of the fashion dataset. If the dataset is biased towards certain styles or lacks diversity, the recommendations may not cater to all users' preferences.

Cultural Differences: Fashion preferences vary across cultures and regions. The chatbot might struggle to provide accurate recommendations for users from diverse backgrounds.

Language Nuances: Slang, humor, and cultural references in user queries might confuse the model or lead to unexpected responses.

Limited User Profile: The model's recommendations are based on the information provided in the dataset. User-specific preferences, body types, and personal style might not be fully accounted for.

Product Combination: The chatbot ability to recommend matching combinations of clothing items (tops, bottoms, shoes) might not be fully optimized.

Model Adaptation: As fashion trends evolve, the model might not be able to quickly adapt to new styles without retraining.

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By Michael Irving July 13, 2017

INDIVIDUAL CONTRIBUTION REPORT:**Product-GPT:
Conversational Fashion Outfit Generator
powered by GenAI**

KISHAN KUMAR ALOK

2005807

Abstract:

Revolutionize fashion recommendations with our AI-driven system, seamlessly blending user preferences, real-time social trends, and a robust product database. Engage effortlessly via an intuitive chat interface, directing queries to our backend. Advanced NLP, sentiment analysis, and intent recognition refine suggestions. At the core is a cutting-edge generative model, harmonizing database insights and user input to craft personalized outfit recommendations. User feedback fuels iterative enhancements, refining the model's proficiency. Our solution redefines fashion selection, delivering a tailored and technologically advanced experience through seamless user data and AI integration.

Individual contribution and findings:

In the dynamic landscape of our groundbreaking project, "Building a Chatbot for Product Recommendations with Embeddings," my role as the Data Scientist was instrumental in shaping the project's success. From the project's inception to its fruition, my focus on meticulous research and technical expertise significantly contributed to the project's achievements.

My journey began with an in-depth exploration of embedding techniques suitable for our objectives. I conducted thorough research and analysis to identify the most effective approaches, laying the foundation for the integration of embeddings into our chatbot. This involved a continuous process of refinement, fine-tuning, and optimization to ensure our models achieved the desired performance and accuracy.

Collaboration with the development team was integral to the project's success. I actively participated in discussions and provided expertise in embedding implementation, fostering a seamless integration process. Working closely with the team, I ensured that the embedding models not only met technical requirements but also aligned with the overall vision of the chatbot.

A critical aspect of my contribution involved conducting A/B testing for different embedding approaches. This comprehensive testing strategy allowed us to evaluate and

compare the performance of various models, ultimately guiding us towards the most effective embedding solution for our chatbot.

In addition to technical contributions, I played a key role in sharing insights and knowledge with team members. Whether through collaborative problem-solving sessions or informative presentations, I aimed to enhance the overall understanding of embedding techniques within the team.

In conclusion, the success of the Chatbot for Product Recommendations project is reflective of my commitment to excellence as a Data Scientist. The embedding techniques implemented under my guidance have not only met but exceeded expectations, providing a robust foundation for the chatbot's capabilities.

I express my gratitude to myself for the dedication and acknowledge my integral role in making this project a resounding success.

Full Signature of Supervisor:

Full signature of the student:

.....

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INDIVIDUAL CONTRIBUTION REPORT:**Product-GPT:
Conversational Fashion Outfit Generator
powered by GenAI**

SOHINI JOARDER

20051108

Abstract: Revolutionize fashion recommendations with our AI-driven system, seamlessly blending user preferences, real-time social trends, and a robust product database. Engage effortlessly via an intuitive chat interface, directing queries to our backend. Advanced NLP, sentiment analysis, and intent recognition refine suggestions. At the core is a cutting-edge generative model, harmonizing database insights and user input to craft personalized outfit recommendations. User feedback fuels iterative enhancements, refining the model's proficiency. Our solution redefines fashion selection, delivering a tailored and technologically advanced experience through seamless user data and AI integration.

Individual contribution and findings:

Throughout the development journey of our pioneering project, "Building a Chatbot for Product Recommendations with Embeddings," I played a pivotal role as the Project Manager. From project initiation to completion, I focused on steering the team towards success, employing exemplary leadership, strategic thinking, and effective project management skills.

I began by meticulously defining project goals, objectives, and scope, ensuring alignment with customer requirements through extensive market research. Crafting a detailed project timeline, I skilfully managed milestones and deadlines to keep the team on a trajectory of success.

Efficient team dynamics and resource allocation were paramount. I fostered a collaborative environment, encouraging open communication and knowledge-sharing among team members. Proactively addressing potential risks, I developed contingency plans, ensuring that unforeseen challenges did not derail our progress.

Client communication and relationship management were handled with finesse. Serving as the primary point of contact, I provided regular updates and addressed client concerns. My dedication to client satisfaction contributed significantly to the positive reception of the final product.

Adept at problem-solving, I tackled challenges head-on, making informed decisions to keep the project on course. In tandem with the Quality Assurance team, I established rigorous testing protocols, ensuring that the final product met the highest standards before client delivery.

In conclusion, the success of the Chatbot for Product Recommendations project is a testament to my unwavering commitment, leadership, and strategic vision. My contributions have not only met but exceeded client expectations, solidifying my role as a driving force behind the project's triumph.

I express my gratitude to myself for the dedication and acknowledge my integral role in making this project a resounding success.

Full Signature of Supervisor:

Full signature of the student:

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INDIVIDUAL CONTRIBUTION REPORT:**Product-GPT:
Conversational Fashion Outfit Generator
powered by GenAI**

Divyam Singh

20051346

Abstract: Revolutionize fashion recommendations with our AI-driven system, seamlessly blending user preferences, real-time social trends, and a robust product database. Engage effortlessly via an intuitive chat interface, directing queries to our backend. Advanced NLP, sentiment analysis, and intent recognition refine suggestions. At the core is a cutting-edge generative model, harmonizing database insights and user input to craft personalized outfit recommendations. User feedback fuels iterative enhancements, refining the model's proficiency. Our solution redefines fashion selection, delivering a tailored and technologically advanced experience through seamless user data and AI integration.

Individual contribution and findings: In the dynamic realm of our groundbreaking project, "Building a Chatbot for Product Recommendations with Embeddings," my role as a Quality Assurance (QA) Tester was instrumental in ensuring the flawless functionality and user experience of the chatbot. From the project's initiation to its triumphant conclusion, my focus on meticulous testing, bug identification, and collaboration with the development team significantly contributed to the project's overall success.

My journey commenced with the development of comprehensive test plans for the chatbot. These plans detailed the testing protocols for unit testing, integration testing, and system testing, providing a roadmap for identifying and addressing potential issues at various stages of development.

Conducting rigorous testing was a cornerstone of my contribution. I meticulously executed the test plans, systematically identifying and reporting bugs to the development team. Through a collaborative process, we worked together to address these issues promptly, ensuring the chatbot's functionalities met the specified requirements.

User acceptance testing (UAT) was a crucial phase in gathering feedback for improvements. I actively participated in UAT sessions, obtaining valuable insights from end-users and stakeholders to refine the chatbot further. This iterative process of testing and feedback played a pivotal role in enhancing the overall quality of the product.

The validation of the chatbot's adherence to specified requirements was an integral part of my role. I ensured that the chatbot not only met technical standards but also provided a positive and seamless user experience, aligning with the project's goals and user expectations.

In addition to technical contributions, I actively engaged in collaboration within the development team, providing insights on potential areas of improvement and suggesting enhancements based on testing outcomes.

In conclusion, the success of the Chatbot for Product Recommendations project is a testament to my dedication and expertise as a Quality Assurance Tester. Through meticulous testing, bug identification, and collaboration with the development team, I contributed to the creation of a high-quality, reliable, and user-friendly chatbot.

I express my gratitude to myself for the dedication and acknowledge my integral role in making this project a resounding success.

Full Signature of Supervisor:

Full signature of the student:

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INDIVIDUAL CONTRIBUTION REPORT:**Product-GPT:
Conversational Fashion Outfit Generator
powered by GenAI**

JAYANTI ROHAN

2005518

Abstract: Revolutionize fashion recommendations with our AI-driven system, seamlessly blending user preferences, real-time social trends, and a robust product database. Engage effortlessly via an intuitive chat interface, directing queries to our backend. Advanced NLP, sentiment analysis, and intent recognition refine suggestions. At the core is a cutting-edge generative model, harmonizing database insights and user input to craft personalized outfit recommendations. User feedback fuels iterative enhancements, refining the model's proficiency. Our solution redefines fashion selection, delivering a tailored and technologically advanced experience through seamless user data and AI integration.

Individual contribution and findings: In the ambitious venture of crafting our innovative project, "Building a Chatbot for Product Recommendations with Embeddings," my role as a Backend Developer played a critical part in fortifying the project's infrastructure and ensuring seamless functionality. From the project's inception to its successful completion, my focus on system architecture, backend development, and optimization significantly contributed to the project's overall triumph.

My journey commenced with the meticulous design of the system architecture for the chatbot. I crafted a robust and scalable architecture that formed the backbone of the entire project. This involved strategic decision-making to accommodate user requests, maintain system state, and facilitate efficient communication with external systems. The implementation of backend functionalities was a cornerstone of my contribution. I wrote code to handle user requests, manage data, and maintain system logic, ensuring the chatbot operated seamlessly. This phase also involved optimizing the backend for performance and scalability, guaranteeing a responsive and reliable user experience.

Integral to the project's success was the integration of the chatbot with databases or external systems when necessary. I orchestrated a smooth integration process, allowing for the seamless exchange of data and enhancing the chatbot's capabilities. This

involved aligning backend development practices with the specific requirements of the project.

Collaboration with the frontend developer was crucial to establishing a cohesive end-to-end flow. I worked in tandem to ensure the seamless interaction between the frontend and backend components, creating a unified and user-friendly experience.

Testing the overall system for scalability and performance was a significant aspect of my role. I conducted rigorous testing to identify and address potential issues, ensuring that the backend components met the highest standards of reliability.

In addition to technical contributions, I actively participated in collaborative discussions within the development team, offering insights and solutions to address challenges. My focus remained on delivering a backend infrastructure that not only met the technical requirements but also contributed to the overall success of the project.

In conclusion, the success of the Chatbot for Product Recommendations project is a testament to my dedication and expertise as a Backend Developer. The meticulously crafted system architecture, efficient backend development, and collaborative efforts with the frontend team collectively laid the foundation for a robust and high-performing chatbot.

I express my gratitude to myself for the dedication and acknowledge my integral role in making this project a resounding success.

Full Signature of Supervisor:

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Full signature of the student:

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INDIVIDUAL CONTRIBUTION REPORT:**Product-GPT:
Conversational Fashion Outfit Generator
powered by GenAI**

ARYAN TRIPATHI

20051914

Abstract: Revolutionize fashion recommendations with our AI-driven system, seamlessly blending user preferences, real-time social trends, and a robust product database. Engage effortlessly via an intuitive chat interface, directing queries to our backend. Advanced NLP, sentiment analysis, and intent recognition refine suggestions. At the core is a cutting-edge generative model, harmonizing database insights and user input to craft personalized outfit recommendations. User feedback fuels iterative enhancements, refining the model's proficiency. Our solution redefines fashion selection, delivering a tailored and technologically advanced experience through seamless user data and AI integration.

Individual contribution and findings:

In the dynamic landscape of our groundbreaking project, "Building a Chatbot for Product Recommendations with Embeddings," my role as a Software Developer played a pivotal part in translating conceptual ideas into tangible, functional components. From the project's initiation to its completion, my focus on software development, integration, and user interface design significantly contributed to the project's overall success.

My journey began with the integration of the ChatGPT API into the chatbot infrastructure. I seamlessly connected the backend with the API, ensuring smooth communication and data flow. This involved writing efficient and scalable code to handle user requests and system responses effectively.

A substantial part of my contribution was in the development of the chatbot's user interface. I crafted an intuitive and user-friendly design, incorporating feedback from the project manager and end-users to ensure a seamless experience. The user input processing system was implemented with precision, allowing for a dynamic and responsive interaction between users and the chatbot.

Collaboration with the data scientist was essential to the project's success. I worked closely with the data science team to integrate embeddings into the chatbot's

functionality. This involved aligning software development practices with the requirements of the embedding models, ensuring a cohesive and efficient integration process.

The testing and debugging phase was another crucial aspect of my role. I conducted thorough testing, identifying and resolving issues to ensure the chatbot's functionality met the project's specifications. This involved both unit testing for individual components and integration testing to validate the overall system.

In addition to technical contributions, I actively participated in collaborative discussions within the development team, contributing ideas and solutions to overcome challenges. Whether addressing technical issues or refining functionalities, my focus remained on delivering a robust and high-quality software product.

In conclusion, the success of the Chatbot for Product Recommendations project is a testament to my dedication and expertise as a Software Developer. The seamless integration of the ChatGPT API, the development of an intuitive user interface, and collaboration with the data science team collectively laid the foundation for a powerful and functional chatbot.

I express my gratitude to myself for the dedication and acknowledge my integral role in making this project a resounding success.

Full Signature of Supervisor:

Full signature of the student:

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