Project Report: Fashion Search AI

Executive Summary

This project successfully developed an AI-powered fashion query response system designed to enhance the user experience by providing detailed and contextually relevant answers to fashion-related questions. By combining a robust search layer with advanced AI models, the system delivers informative responses to aid users in discovering fashion items tailored to their preferences.

Objectives

The primary goal was to create a fashion query response system that leverages AI to generate user-friendly responses, improving the user experience and assisting users in finding fashion items based on their specific needs.

System Design

The system architecture comprises two key components:

1. **Search Layer**: This layer focuses on retrieving relevant fashion items from the dataset based on keyword matching or predefined criteria, ensuring that the system can quickly identify items of interest.

2. **Generation Layer**: This layer employs sophisticated AI models, such as GPT-3.5, to generate comprehensive responses to user queries. The models are trained to incorporate context and produce responses in natural language, making the system feel intuitive and easy to use.

Implementation

The implementation process involved the following steps:

1. **Data Preprocessing**: The CSV dataset underwent cleaning and formatting to ensure data quality and consistency. This included replacing blank entries, standardizing decimal points, removing unnecessary columns, and cleaning text columns to remove HTML tags and extra characters.

2. **Model Integration**: Advanced AI models, notably GPT-3.5, were seamlessly integrated into the system to power the response generation process. User queries are passed through these models to generate detailed and contextually relevant responses.

3. **Query Response Generation**: The system processes user queries using both the search and generation layers. The search layer retrieves relevant fashion items from the dataset, while the generation layer utilizes AI models to craft detailed responses that incorporate context and are expressed in natural language.

Here are the few queries that were used to test the model:

#Query 1:I'm seeking high-quality sarees suitable for professional settings such as office meetings and formal events. I prefer elegant colors like pink, violet, or green, and would like the sarees to have full embroidery designs. Price is not a major concern, as I prioritize quality and craftsmanship.

Search Layer:

Query:
I'm seeking high-quality sarees suitable for professional settings such as office meetings and formal events.
I prefer elegant colors like pink, violet, or green, and would like the sarees to have full embroidery designs.
Price is not a major concern, as I prioritize quality and craftsmanship.

Top 3 Search Layer   To exit full screen, press [Esc]

	IDs	Documents	Distances	Metadatas
0	17833732	\ Design Details \ \ \ Pink saree \<...	0.29170286655426025	{'Brand': 'Grancy', 'Colour': 'Pink', 'Descrip...
1	18605378	\ Design Details \ \ Pink and gre...	0.296592116355896	{'Brand': 'Vishal Prints', 'Colour': 'Pink', '...
2	18845466	\ Design Details \ \ Blue and pin...	0.29879521897814576	{'Brand': 'Charukriti', 'Colour': 'Blue', 'Des...
3	18207054	\ Design Details \ \ \ Pink and red...	0.2990189492702484	{'Brand': 'Sangria', 'Colour': 'Pink', 'Descri...
4	17066888	\Design Details \\ \ Brown and orange...	0.3014145791530609	{'Brand': 'KALINI', 'Colour': 'Brown', 'Descri...
5	19100314	\ Design Details \ \ \ Beige and gr...	0.30449819564819336	{'Brand': 'BEATITUDE', 'Colour': 'Beige', 'Des...
6	17737450	\Design Details \\ \ Teal blue and or...	0.30760297179222107	{'Brand': 'Sangria', 'Colour': 'Teal', 'Descri...
7	17075368	\ Design Details \ \ \ Beige and ye...	0.30961841344833374	{'Brand': 'KALINI', 'Colour': 'Beige', 'Descri...
8	18286442	\ Design Details \ \ \ Blue saree \<...	0.3100244998931885	{'Brand': 'VASTRANAND', 'Colour': 'Blue', 'Des...
9	15961028	\Design Details \\ \ Mauve and white ...	0.3134758542957816	{'Brand': 'Saree mall', 'Colour': 'Mauve', 'De...

Generation layer:

Based on your preference for high-quality sarees with full embroidery designs in elegant colors like pink, violet, or green, here are some recommendations from our dataset:

1. **Pink Saree by Grancy**
   - Brand: Grancy
   - Color: Pink
   - Description: This saree is elegantly designed with intricate embroidery, making it suitable for To exit full screen, press `Esc` events.
   - Product Image: [Link](Product_img_url)

2. **Pink and Red Saree by Sangria**
   - Brand: Sangria
   - Colors: Pink and Red
   - Description: Featuring a blend of pink and red tones, this saree offers a sophisticated look with detailed embroidery work.
   - Product Image: [Link](Product_img_url)

3. **Blue and Pink Saree by Charukriti**
   - Brand: Charukriti
   - Colors: Blue and Pink
   - Description: While this saree includes blue and pink hues, its elegant design and embroidery make it a versatile choice for various occasions.
   - Product Image: [Link](Product_img_url)

These sarees meet your criteria of high-quality fabrics, full embroidery designs, and elegant colors. You can explore these options further for your professional and formal attire needs. For more detailed pricing and availability inform

Top 3 Search Results

| ID: 18845466 | ID: 17833732 | ID: 18207054 |

#Query 2: I'm looking for a black leather jacket that's stylish and versatile enough to wear with a wide range of outfits and for different types of occasions.

Search Layer:

Query:
I'm looking for a black leather jacket that's stylish and versatile enough to wear with a wide range of outfits and for different types of occasions.

Top 3 Search Layer

| ID: 10319921 | ID: 18153246 | ID: productimage |

	IDs	Documents	Distances	Metadatas
0	10319921	Black solid tailored jacket, has 2 pocket...	0.3024021089076996	{'Brand': 'Belle Fille', 'Colour': 'Black', 'D...
1	18153246	Black solid leather jacket with zip detail, ...	0.3024243414402008	{'Brand': 'Justanned', 'Colour': 'Black', 'Des...
2	13168738	Black solid jacket, has a spread collar, 6 poc...	0.3077305257320404	{'Brand': 'Justanned', 'Colour': 'Black', 'Des...
3	13148326	Black and White printed jacket, has a spread c...	0.3144320845603943	{'Brand': 'Amydus', 'Colour': 'Black', 'Descri...
4	18904348	Brown solid leather jacket with zip detail, ...	0.3168545961380005	{'Brand': 'Levis', 'Colour': 'Brown', 'Descrip...
5	10321367	Yellow solid tailored jacket, has a lapel coll...	0.3208831067085266	{'Brand': 'Belle Fille', 'Colour': 'Yellow', '...
6	15673166	Black solid biker jacket, has a notched lapel ...	0.3223259449005127	{'Brand': 'Missguided', 'Colour': 'Black', 'De...
7	16326514	Black solid lightweight padded jacket with zi...	0.3313920795917511	{'Brand': 'Adobe', 'Colour': 'Black', 'Descrip...
8	12907234	Black solid sporty jacket, has a hood, 2 pocke...	0.3322550356388092	{'Brand': 'HRX by Hrithik Roshan', 'Colour': '...
9	15110790	Black solid windcheater tailored jacket, has a...	0.33574044704437256	{'Brand': 'Campus Sutra', 'Colour': 'Black', '...

Generation layer:

Based on the provided fashion items in the dataset, here are three black jackets that are stylish and versatile for various occasions:

1. Product: Black Solid Leather Jacket with Zip Detail
   - Brand: Justanned
   - Description: A black leather jacket with zipper details for a sleek look.
   - Ideal for: Versatile enough to be paired with different outfits for a stylish appearance.
   - Product Image: [Link to Product Image](Product_img_url)

2. Product: Black Solid Jacket with Spread Collar
   - Brand: Justanned
   - Description: This black jacket features a spread collar and 6 pockets for added utility and style.
   - Suitable for: Pairing with a wide range of outfits for different types of occasions.
   - Product Image: [Link to Product Image](Product_img_url)

3. Product: Black Solid Sporty Jacket with Hood
   - Brand: HRX by Hrithik Roshan
   - Description: A black sporty jacket with a hood and 2 pockets for a casual yet stylish appearance.
   - Versatility: Can be worn with various outfits to suit different occasions.
   - Product Image: [Link to Product Image](Product_img_url)

For more detailed information or to make a purchase, you can visit the respective brand's website or explore further details by referring to the provided IDs in the dataset.

Top 3 Search Results

| ID: 18153246 | ID: productimage | ID: 12907234 |

#Query 3:I'm looking for a summery dress or kurta that I can wear over my blue jeans for the office.

Search Layer:

Query:
I'm looking for a summery dress or kurta that I can wear over my blue jeans for the office.

Top 3 Search Layer

| ID: 16190778 | ID: 17923630 | ID: 12418804 |

	IDs	Documents	Distances	Metadatas
0	16190778	Orange printed kurta with trousers <b>K...	0.2557249069213867	{'Brand': 'Anouk', 'Colour': 'Orange', 'Descri...
1	17923630	Orange printed Kurta with Trousers and dupatta...	0.25653550028800964	{'Brand': 'Biba', 'Colour': 'Orange', 'Descrip...
2	12418804	Maroon and orange yoke design kurta with palaz...	0.2572370767593384	{'Brand': 'Indo Era', 'Colour': 'Maroon', 'Des...
3	11113624	Beige, green and blue printed kurta with palaz...	0.26758551597595215	{'Brand': 'Popnetic', 'Colour': 'Beige', 'Desc...
4	13810898	Blue and green printed kurta with palazzos and...	0.26959094405174255	{'Brand': 'Indo Era', 'Colour': 'Blue', 'Descr...
5	12068028	This clothing set consists of top and skirt<br...	0.2712552547454834	{'Brand': 'Inddus', 'Colour': 'Orange', 'Descr...
6	12130790	Mustard Yellow and red woven design kurta with...	0.272837370634079	{'Brand': 'Inddus', 'Colour': 'Mustard', 'Desc...
7	13770728	Blue and white printed kurta with palazzos and...	0.2735278904438019	{'Brand': 'Nayo', 'Colour': 'Blue', 'Descripti...
8	13895534	Purple solid kurta with trousers Purple A-l...	0.2740674614906311	{'Brand': 'Inddus', 'Colour': 'Purple', 'Descr...
9	14381366	Peach-coloured and orange a-line kurti...	0.27474936842918396	{'Brand': 'all about you', 'Colour': 'Peach', ...

Generation layer:

Based on the information provided in the top 3 search results, here are some summery dress or kurta options that you can wear over your blue jeans for the office:

1. **Beige, Green, and Blue Printed Kurta with Palazzos (Popnetic)**
   - This kurta with palazzos features a blend of beige, green, and blue colors in a beautiful print.
   - Brand: Popnetic

2. **Blue and Green Printed Kurta with Palazzos (Indo Era)**
   - A stylish kurta paired with palazzos in blue and green prints, offering a vibrant look.
   - Brand: Indo Era

3. **Blue and White Printed Kurta with Palazzos (Nayo)**
   - This kurta ensemble combines blue and white prints for a fresh and summery appeal.
   - Brand: Nayo

These kurta options can be a great choice to layer over your blue jeans for a comfortable and office-appropriate look during the summertime. You can explore these pieces further to find the one that best suits your style and office envi

Top 3 Search Results

| ID: 11113624 | ID: 13810898 | ID: 13770728 |

#Query 4: I am looking for a festive ethnic set from Ishin, specifically for adults. The ideal set would feature a navy blue top with golden foil print, round neck, and three-quarter sleeves. It should come with a matching skirt that has a drawstring closure. Both the top and skirt should be made from 100% cotton.

Search Layer:

Query:
I am looking for a festive ethnic set from Ishin, specifically for adults.
The ideal set would feature a navy blue top with golden foil print, round neck, and three-quarter sleeves.
It should come with a matching skirt that has a drawstring closure.
Both the top and skirt should be made from 100% cotton.

Top 3 Search Layer

ID: 11253928

ID: 18345376

ID: 18882466

	Metadatas	Documents	Distances	IDs
0	{'Brand': 'Ishin', 'Colour': 'Navy Blue', 'Des...	This clothing set consists of top and skirt<br...	0.237470	11253928
1	{'Brand': 'CRAZEVILLA', 'Colour': 'Navy Blue',...	This clothing set consists of Top and Skirt<br...	0.276990	18345376
2	{'Brand': 'Rain & Rainbow', 'Colour': 'Navy Bl...	Navy blue a-line kurti Ethnic ...	0.297212	18882466
3	{'Brand': 'Sztori', 'Colour': 'Navy Blue', 'De...	Navy and golden a-line kurti...	0.300113	16276470
4	{'Brand': 'STREET 9', 'Colour': 'Blue', 'Descr...	<p>This clothing set consists of top, trouser ...	0.300891	18497968
5	{'Brand': 'Meeranshi', 'Colour': 'Orange', 'De...	This clothing set consists of top, trousers an...	0.304071	10642980
6	{'Brand': 'W', 'Colour': 'Off White', 'Descrip...	This clothing set consists of top and trousers...	0.304690	11596414
7	{'Brand': 'Inddus', 'Colour': 'Black', 'Descri...	This clothing set consists of top and skirt<br...	0.304973	13728148
8	{'Brand': 'Varanga', 'Colour': 'Navy Blue', 'D...	Colour: navy blue and red ...	0.306191	17408530
9	{'Brand': 'Global Desi', 'Colour': 'Green', 'D...	Green and pink regular A-line top ...	0.306687	14960422

Generation layer:

I found a festive ethnic set that matches your requirements from Ishin:

1. **Item Name**: Navy Blue Cotton Top and Skirt Set
   - **Brand**: Ishin
   - **Description**: This set includes a navy blue top with golden foil print, round neck, and three-quarter sleeves along with a matching skirt featuring a drawstring closure. Both pieces are made from 100% cotton.
   - **Product Image**: [Link to Product Image](Product_img_url)

If you wish to explore more details or make a purchase, please visit the respective product page using the provided IDs:
- Item 1: [Link to Product Page](Insert Link with ID 11253928)

This festive ethnic set from Ishin perfectly fits your criteria for a stylish and comfortable attire.

Top 3 Search Results

ID: 11253928

ID: 18497968

ID: 17408530

Conclusion

This project successfully developed an AI-driven fashion query response system that promises to improve the way users search for and discover fashion items. The system's ability to generate detailed, contextually relevant responses represents a significant step forward in enhancing the fashion shopping experience. By combining robust search capabilities with advanced AI models, the system empowers users with information and empowers them to make informed choices about fashion products.

Challenges and Lessons Learned

During the project implementation, several challenges were encountered:

1. **Metadata Processing**: Initial difficulties in processing metadata impacted the display of results. However, these issues were successfully resolved through meticulous debugging and refinement of the metadata processing code.

2. **Dataset Chunking**: Loading the entire dataset at once posed memory challenges. While chunking was not implemented due to time constraints and the dataset's manageable size, it was identified as a potential solution for handling larger datasets in the future.

These challenges underscored the importance of thorough data preprocessing and the need for efficient data processing techniques, especially when dealing with larger datasets. The integration of advanced AI models like GPT-3.5 proved to be highly beneficial in generating detailed and contextually relevant responses, showcasing the potential of AI in enhancing search capabilities.

Future Enhancements

To further improve the system, future enhancements could include:

* **Flask Web Application**: Implementing the system as a Flask web application would enable greater interactivity and an improved user interface, making it more accessible and engaging for users.

* **Prompt Refinement**: Continual refinement of the prompts used to interact with the AI models could lead to even more accurate and informative responses.

* **Interactive Sessions and Filters**: Introducing interactive sessions with criteria-based filters would empower users to refine their searches and discover fashion items more precisely tailored to their preferences.

Comparative Analysis: Search vs. Generation Layers

A comparative analysis of the search and generation layers reveals distinct strengths in each:

*   **Search Layer**: Excels at efficiently retrieving relevant information based on keyword matching or predefined criteria, making it ideal for quick and targeted searches.

*   **Generation Layer**: Leveraging advanced AI models, it produces more detailed, comprehensive, and contextually relevant responses in natural language, offering a superior user experience.

The generation layer's ability to understand query context and generate human-like responses makes it particularly well-suited for tasks that require a deeper understanding of information and nuanced communication.

Conclusion

In conclusion, this project has successfully developed a fashion query response system that combines the strengths of both search and generation layers. While the search layer provides efficient information retrieval, the generation layer elevates the user experience by delivering detailed and contextually relevant responses. The project's findings highlight the significant potential of AI in transforming how users search for and interact with fashion information, paving the way for more sophisticated and personalized fashion search experiences in the future.