

BrainBytes: Storytelling for Smart Learning

BrainBytes is an innovative educational chatbot that transforms complex concepts into engaging, memorable stories. It's designed to make learning accessible and fun for students and lifelong learners.

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Course: INFO7375 Prompt Engineering & AI

Date: July 2024



The Inspiration Behind BrainBytes

Personal Challenge

Difficulty remembering and revising complex concepts from research papers, text books etc while preparing for interviews and exams

Story Power

Discovering that stories improved concept retention sparked the idea

Learning Aid

Help others learn through storytelling, images, quizzes and flashcards

| Link to current version Deployed on Hugging Face : [Link](#)



Project Objectives and Goals



Simplify Complex Content

Convert difficult educational concepts into easy-to-understand stories that resonate with students (Personalized stories based on their favourite topic. ex. Marvel Character)



Enhance Engagement & Make learning Fun

Use interactive storytelling to capture students' attention and improve information retention using downloadable quizzes, flashcards etc



User-Friendly Platform

Provide an intuitive interface that is easy to navigate and caters to diverse learning needs and preferences



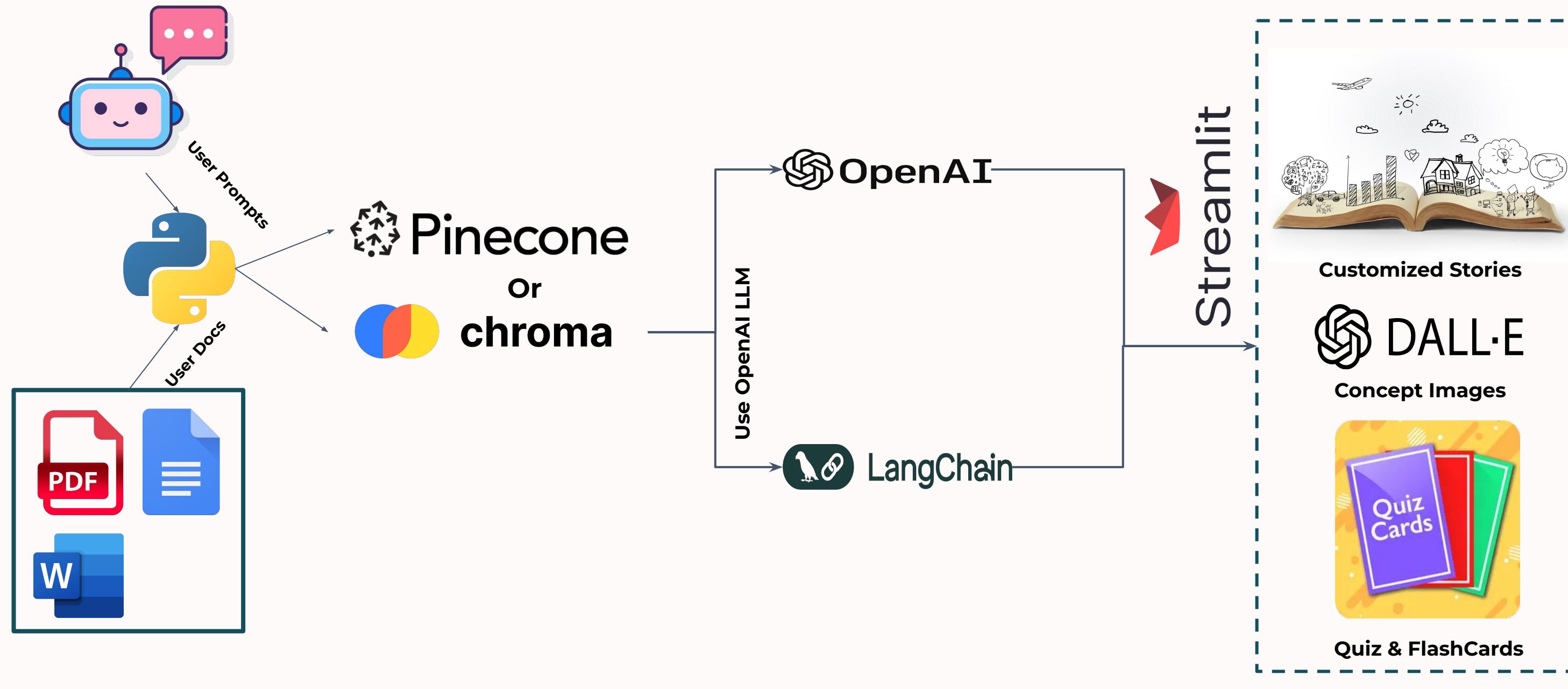
Demonstrate Generative AI Skills

Showcase the practical use of AI and machine learning in revolutionizing educational methodologies (Specifically for the Prompt Course)

Project Architecture



Hugging Face



Data Collection and Preprocessing

Data Sources

Aggregated from educational databases, user queries, and reputable online sources to ensure comprehensive and accurate content

- **Queries based on User Documents - RAG Pipeline**
- **General Queries - From Preprocessed data in Vector Database, Cached Queries**

Collection Steps

Collecting user inputs and educational content, followed by filtering and validating data for relevance and accuracy
Security: Truncate the vector data specific to user after a defined period (15 days/ 1 Month)

Preprocessing Techniques

- cleaning to remove unnecessary characters
- Tokenization to break down text into manageable units(use openAI embeddings)
- Ensuring relevance by prioritizing high-quality educational content(RAG using LangChain))

RAG Pipeline Implementation

1

Data Preprocessing and Loading

This step will include document loading, splitting and using embeddings to store in a vector database such as Chroma

2

Data Retrieval & Context Understanding

Fetching relevant information based on user input from the preprocessed database and use prompts

3

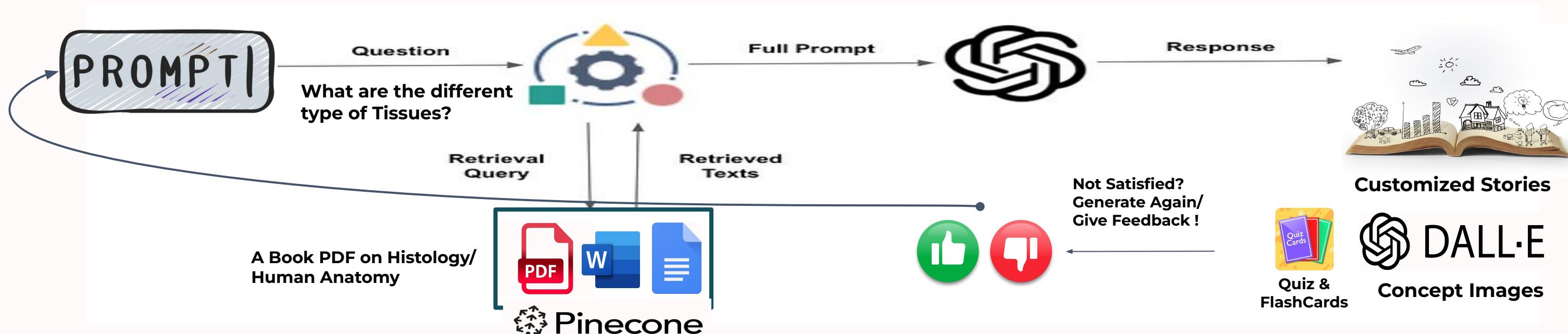
Story Generation

Using models like GPT-4o to craft a story that incorporates the retrieved information in an engaging manner

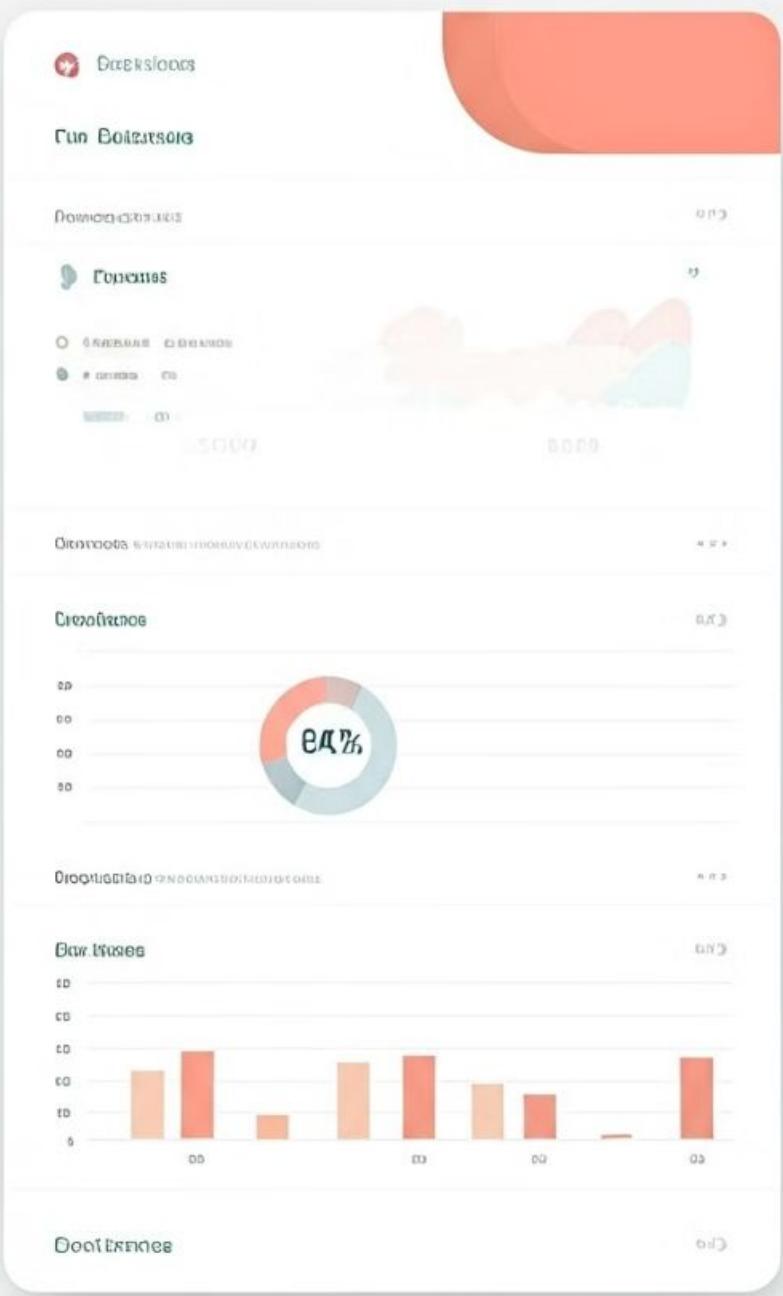
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Feedback Integration

Incorporating user feedback to continuously refine and improve the generated stories



Performance Metrics



Metric	Calculation Method	Initial Results
User Engagement	Analyzing interaction patterns and queries/day	Normal engagement, 15 queries/day
Story Accuracy & Relevance	Benchmark queries and user surveys (esp. unsatisfied query users)	Positive feedback on relevance and simplicity)
Latency	Avg time for results based on user prompts	Fairly good on simple queries(<10 sec)

Methods to Improve Metrics

Enhancing Story Accuracy

Refining data preprocessing and retrieval algorithms to ensure more precise and relevant story generation

Decrease Latency for larger common queries

Cache common queries and responses and retrieve them from Cache using tools like Redis

Improving User Interface

Making the platform more intuitive and visually appealing to enhance user experience and engagement

Optimizing Preprocessing and RAG Pipeline

Enhancing response time and accuracy through advanced text processing techniques and algorithm refinement





Deployment Plan

1

Finalize Application

Complete development and testing phases, ensuring all components are ready for deployment

2

Launch and User Testing

Deploy on Hugging Face or cloud platforms(GCP, AWS) and conduct thorough beta testing to gather user feedback

3

Expand Features

Implement multi-language support, personalized learning paths, and interactive learning modules

4

Continuous Improvement

Integrate new AI technologies and adapt based on ongoing user feedback and educational trends

Future Work



Multi-Language Support

Expand BrainBytes to support multiple languages, enabling global access to our innovative storytelling learning platform. **A story in their own language is easy to remember**



Personalized Learning & Recommendations

Not just students but other professions too! Udemy/Coursera course Recommendations
Incorporate features that adapt to each user's needs and preferences



Gamification in Education

Interactive Modules

Develop a suite of interactive learning modules that combine storytelling, simulations, and gamification to enhance the educational experience

Conclusion: Revolutionizing Learning



Innovative Solution

BrainBytes offers a groundbreaking approach to understanding complex educational concepts through AI-powered storytelling



Transformative Potential

The project demonstrates the effective use of AI in education, highlighting its potential to revolutionize learning methodologies



Global Impact

BrainBytes has the potential to make learning more accessible, effective, and enjoyable for students worldwide



Thank You!

Any Questions?