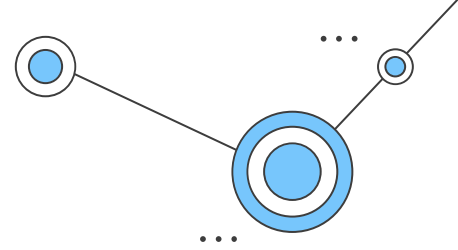


# •: Problem Statement Medical-Report Analyzer



- Team Name: **nagakarthick2004**  
Team Member Names:
  - Keerthana G
  - Karthick N G

# Idea Brief



- The Llama2 Medical Bot is a powerful tool designed to provide medical information by answering user queries using state-of-the-art language models and vector stores.
- The "Medical Report Analyser Hackathon" is a groundbreaking initiative that aims to harness the power of state-of-the-art Natural Language Processing (NLP) technology to revolutionize the healthcare industry.
- The primary challenge is to leverage NLP techniques to extract valuable insights from medical reports in PDF format, facilitating faster and more accurate diagnoses.
- Additionally, a conversational agent capable of answering queries related to the analysis.
- The idea involves developing an end-to-end application for medical report analysis using state-of-the-art Natural Language Processing (NLP) technology. The application aims to streamline the interpretation of medical reports, ensuring faster and more accurate diagnoses. Additionally, a conversational agent will be implemented to answer queries related to the analysis.



# Technologies Used

## 1. Programming Languages

- **Python**

## 2. Web Framework

- **Chainlit** – Used for building interactive Web Applications
- **React and Flask** - Under Development

## 3. Libraries and Frameworks

## 4. Data Analysis & Visualization

- **Pandas, NumPy** - Data manipulation & Numerical operation
- **Plotly, Matplotlib** – Creating interactive plots & charts

## 5. TensorFlow or PyTorch - For building ML models to analyze market trends and make predictions

6. Language Model: [Link to model](#)

7. Embeddings Model: [LaMini700M](#)

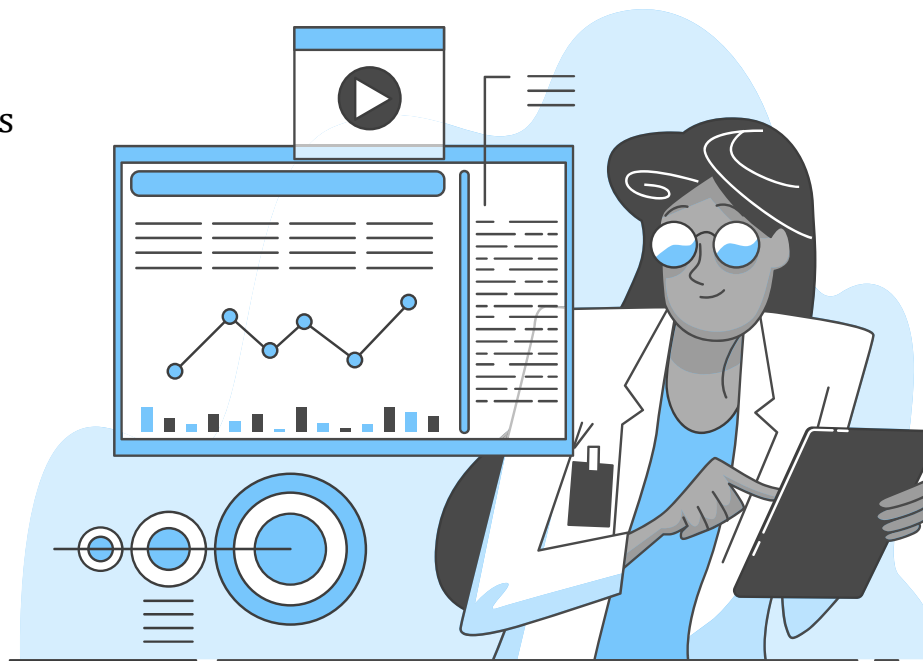
8. Vector Store: FAISS.

9. Document Loaders: PyPDFLoader, DirectoryLoader.

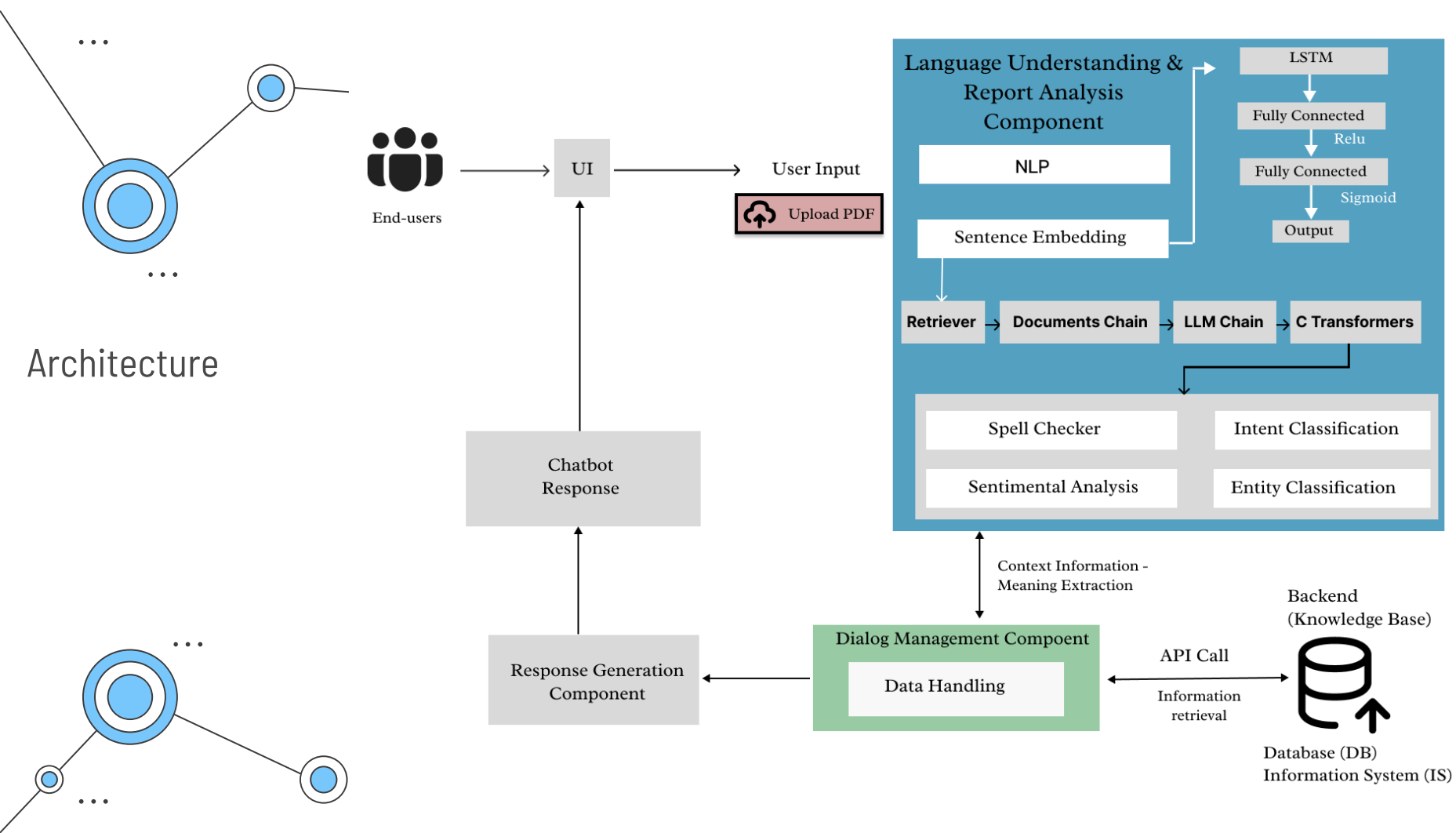
10. Text Splitter: RecursiveCharacterTextSplitter.

## 11. Version control

12. Git & GitHub



# Architecture



# Challenges Faced

## 1.Data Variability:

1. **Challenge:** Medical reports often vary in structure and format, presenting a challenge for consistent data extraction.
2. **Commitment:** Continuously refining the data extraction process to handle diverse report structures, ensuring robust performance across various formats.

## 2.NLP Model Optimization:

1. **Challenge:** The current NLP model may face limitations in understanding highly specialized medical language and context.
2. **Commitment:** Actively seeking ways to enhance the NLP model, exploring domain-specific embeddings, and collaborating with experts to improve the model's understanding of medical terminology.

## 3.Scalability:

1. **Challenge:** As the application gains popularity, scalability concerns may arise in handling a larger volume of medical reports and user queries.
2. **Commitment:** Implementing scalable architecture and continuously monitoring system performance to ensure responsiveness and efficiency, especially during peak usage.

## 4.Conversational Agent Accuracy:

1. **Challenge:** The conversational agent's responses may not always meet the desired accuracy, impacting the user's trust in the system.
2. **Commitment:** Fine-tuning the conversational agent through iterative training, incorporating user feedback to improve answer quality.

# Future Steps

## 1.NLP Model Refinement:

1. Iteratively refining the NLP model by incorporating the latest advancements in transformer-based architectures.
2. Exploring pre-trained models fine-tuned specifically for the medical domain to enhance understanding and context awareness.

## 2.User Interface Enhancement:

1. Collaborating with UX/UI specialists to enhance the user interface based on feedback and evolving industry standards.
2. Implementing features such as interactive visualizations to aid in the interpretation of complex medical insights.

## 3.Incorporating Advanced Features:

1. Adding features such as automated summarization of lengthy medical reports for quick review.
2. Introducing multilingual support to cater to diverse user demographics.

## 4.Collaboration with Healthcare Professionals:

1. Engaging with healthcare professionals to gather domain-specific knowledge and insights for continuous improvement.
2. Conducting workshops and obtaining real-world feedback to align the solution with the practical needs of medical practitioners.

## 5.Community Engagement and Open Source:

1. Considering open-sourcing components of the solution to encourage community contributions and foster innovation.
2. Hosting hackathons or collaborative events to involve the wider community in addressing challenges and ideating new features.

# Output 1

**Chatbot** 10:55 PM

Hi, Welcome to Medical Bot. What is your query?



**You** 10:55 PM

Give me the diagnosis

Took 1 step

**Chatbot** 11:06 PM

Mr. Tan has possible memory loss of his recent past due to psychotic symptoms. He is currently undergoing investigations for further evaluation of his condition. His orientation to time, place, and person are affected as evident by his inability to recall being in a hospital clinic despite identifying his son.

Please provide the diagnosis based on the information provided above.

Sources:[Document(page\_content='blankly and shook his head. I asked him whether he remembered being in hospital\nbefore , Mr Tan nodded. I asked him if he knew what he was in hospital for. Mr Tan\nshook his head. I asked him if he was taking any medicine at the moment. Mr Tan just\nlooked at me blankly and did not reply. '\n\nDate of physical examination/ mental state examination: 20 June 2015 '\n\nRelevant investigation results: '\n\nResults of CT brain , MRI brain scan and other investigations to be stated. '], metadata={'source': 'data/samp\_pd.pdf', 'page': 3}), Document(page\_content='psychotic symptoms . '\n\nOrientation to time, place and person '\n\nWith regard to his orientation to time, place and person, he was unable to tell that he\nwas in a hospital

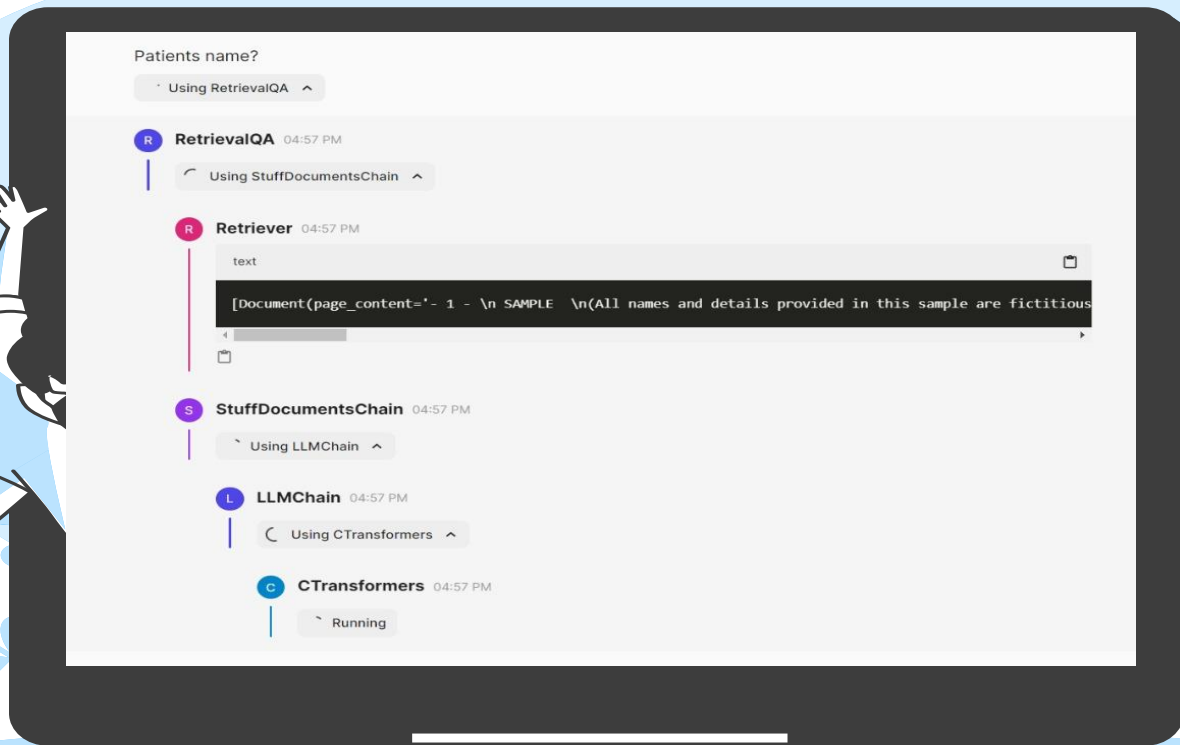


Type your message here...



Built with Chainlit

# Output 2



GitHub Link: <https://github.com/KeerthanaG23/Medical-Report-Analyser>