Medical Translator
Libraries used:
- openai: Used for accessing OpenAI's GPT model.
- streamlit: Used to create the web application interface.
- speech_recognition: Used to recognize speech input from the microphone.
- gtts (Google Text-to-Speech): Used to convert text to speech.
- os: Used for file operations.
- tempfile: Used to create temporary files for storing audio.
- base64: Used to encode audio files for playback in Streamlit.
- pycountry: Used to convert language names to ISO 639-1 codes.

What the code is trying to achieve:
The code aims to create a web application that translates text from one language to another. It allows users to input text either by typing or speaking. The translation is performed using Generative pre-trained transformer model, which provides detailed explanations for technical terms. The application also converts the translated text into speech and plays it back to the user.

Input format and structure:
1. Input Method Selection: Users can choose between "Text" and "Voice" input methods.
   - Text: Users type the text they want to translate.
   - Voice: Users record their speech, which is then converted to text.

2. Text: The text to be translated (if the text input method is selected).
   - Data type: `string`
   - Example: `"Translate this technical document to Spanish."`

3. Source Language: The language of the input text.
   - Data type: `string`
   - Example: `"English"`

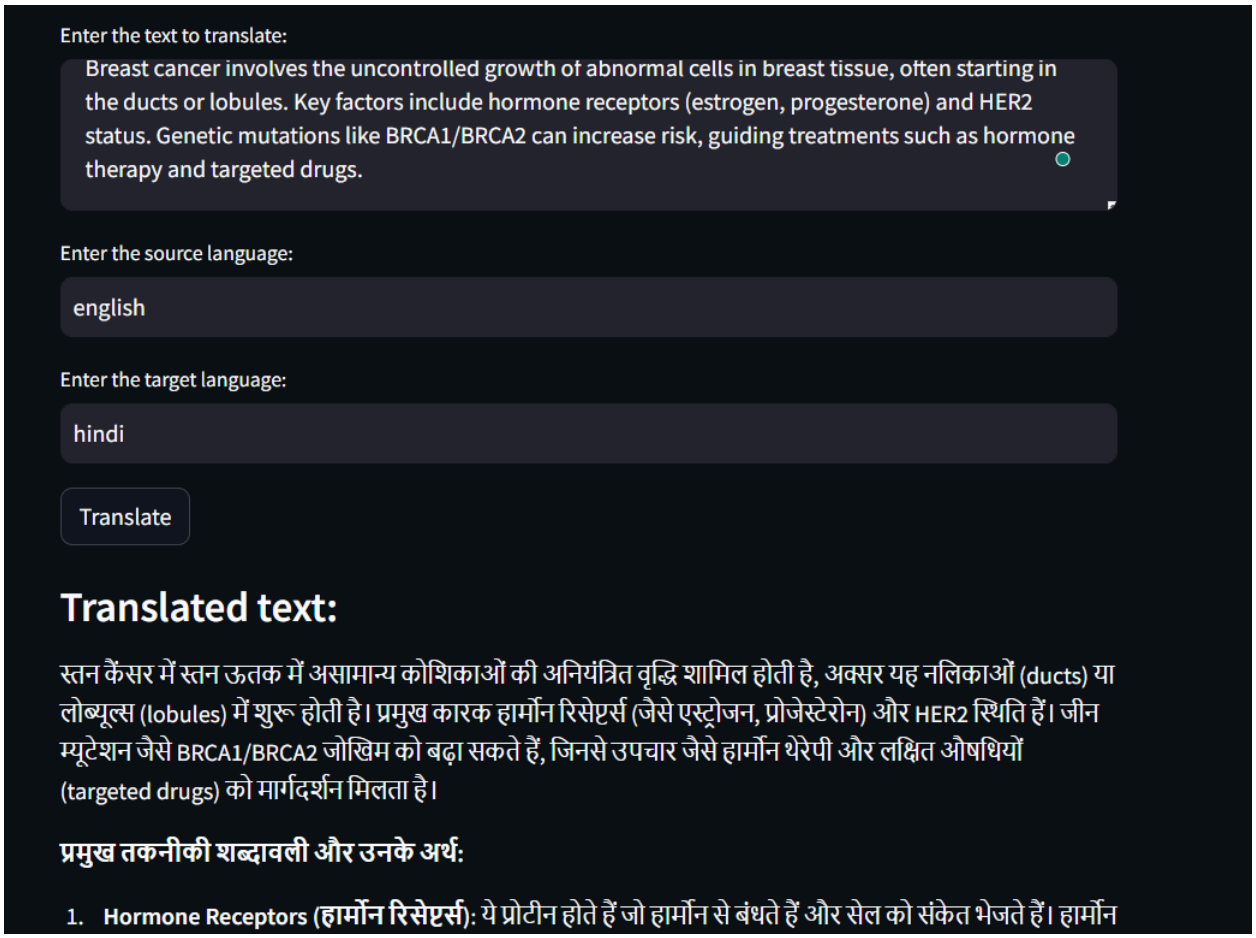
4. Target Language: The language to which the text will be translated.
   - Data type: `string`
   - Example: `"Hindi"`

Output expected, format and structure:
1. Translated Text: The translated text with detailed explanations for technical terms.
   - Data type: `string`
   - Example: `"Traduce este documento técnico al español. ... (detailed explanations for technical terms)"`

2. Audio Playback: The translated text is converted to speech and played back.
   - Audio format: `mp3`

- The audio file is generated using `gTTS` and played back using Streamlit's `markdown` with embedded audio controls.

Code Summary:
- The application starts by allowing the user to choose the input method (text or voice).
- If the text method is selected, the user enters the text manually. If the voice method is selected, the user records their speech, which is then transcribed to text.
- The user inputs the source and target languages.
- Upon clicking the "Translate" button, the application translates the text using OpenAI's GPT model and displays the translated text with explanations.
- The application converts the translated text to speech and plays the audio back to the user.



Medical Translator

Translate text from one language to another with detailed explanations for technical terms.

Select input method:

- ○ Text
- ◉ Voice

Record

Listening...

Recognized text: your Lab reports have indicated that you have breast cancer so moving forward Dr Pramod will start you on an immunotherapy Regime and help you fight cancer don't worry we are all there to help you find this Battle against cancer

Translated text:

आपकी लैब रिपोर्ट्स दर्शाती हैं कि आपको स्तन कैंसर है, इसलिए आगे बढ़ते हुए डॉ प्रमोद आपको एक इम्यूनोथेरपी रेजीम पर शुरू करेंगे और कैंसर से लड़ने में आपकी मदद करेंगे। चिंता न करें, हम सभी इस कैंसर के खिलाफ लड़ाई में आपकी मदद के लिए मौजूद हैं।

Technical Terms Explanation:

1. ** स्तन कैंसर (Breast Cancer) **: यह एक प्रकार का कैंसर है जो स्तन कोशिकाओं में निर्माण करता है। यह महिलाओं में सबसे आम कैंसर रूपों में से एक है।
2. ** इम्यूनोथेरपी (Immunotherapy) **: यह एक प्रकार का इलाज है जिसमें शरीर की प्रतिरक्षा प्रणाली को मजबूत किया जाता है या कैंसर कोशिकाओं को निशाना बनाने के लिए प्रशिक्षित किया जाता है, ताकि वे कैंसर कोशिकाओं को नष्ट कर सकें।
3. ** रेजीम (Regime) **: यह विशेष चिकित्सा या उपचार योजना को संदर्भित करता है जो मरीज को निर्धारित की जाती है।

Speaking the translated text:

HealthBuddy:

Libraries used:

-os: Provides a way of using operating system dependent functionality like reading or writing to the file system.

-PdfReader: Used to read and extract text from PDF files.

-SentenceTransformer: A library from sentence-transformers used to create embeddings from text.

-faiss: A library for efficient similarity search and clustering of dense vectors.

-openai: Used to interact with OpenAI's GPT models for generating responses.

-streamlit: A framework for creating web applications in Python.

What the code is trying to achieve:

The code is designed to create a web application that processes PDF files containing medical information, extracts text from these files, and uses machine learning models to create a searchable vector store. The application can then answer user queries about medications by finding relevant context from the processed texts and generating responses using LLM models.

Input format and structure:

PDF Files: The user uploads PDF files containing medical information, general oncology documents, her, medical reports and prescriptions.

User Queries: The user inputs queries related to medications through a text input field in the web application.

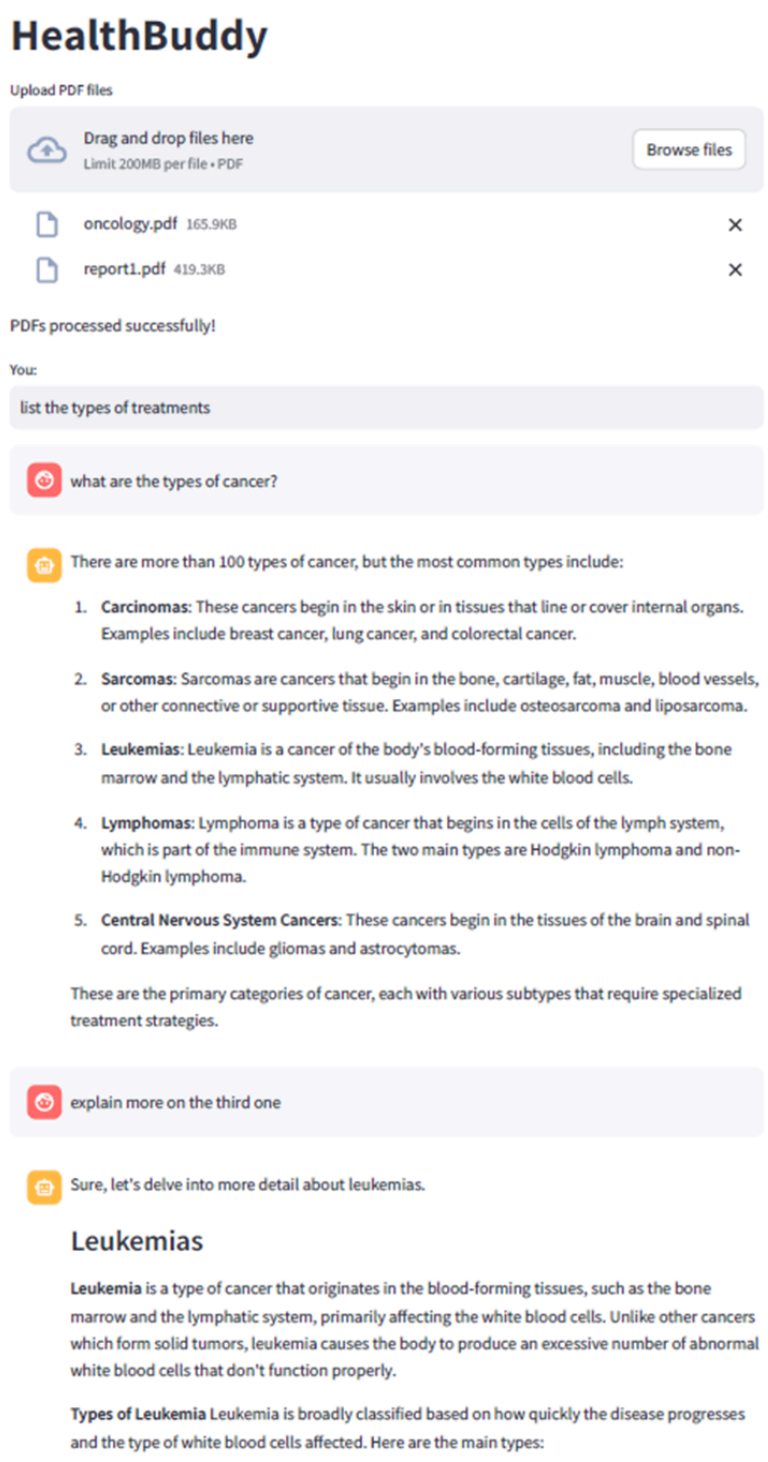
Features:

Processed Texts: The extracted text from the uploaded PDF files.

Contextual Responses: Answers to user queries about medications, generated by the GPT model based on the relevant context found in the processed texts.

Chat History: A record of the conversation between the user and the assistant, displayed in the web application.

Console Output:



Emotional Support Bot:

Libraries used:

-os: Provides a way of using operating system dependent functionality like reading or writing to the file system.

-PdfReader: Used to read and extract text from PDF files.

-SentenceTransformer: A library from sentence-transformers used to create embeddings from text.

-faiss: A library for efficient similarity search and clustering of dense vectors.

-openai: Used to interact with OpenAI's GPT models for generating responses.

-streamlit: A framework for creating web applications in Python.

What the code is trying to achieve:

The Emotional Guidance Bot aspect of the code offers support and advice on emotional well-being and mental health. By processing PDF files containing information on emotional health, stress management, and psychological support strategies, the system creates a resource base for addressing queries related to emotional wellness. When users ask questions or seek advice on managing emotions, reducing stress, or improving mental health, the bot leverages the processed information to generate empathetic, supportive responses. These responses may include practical tips, coping mechanisms, and encouragement to seek professional help when needed. The primary objective is to provide accessible, compassionate guidance to individuals seeking to navigate challenges related to their emotional and mental health.

Features:

Input: PDF files containing emotional health information and user queries about emotional well-being.

Output: Detailed guidance on emotional health, including coping strategies, mental health tips, and resources for further support.

Output expected, format and structure:

Processed Texts: The extracted text from the uploaded PDF files.

Vector Store: A searchable index created from the text embeddings.

Contextual Responses: Answers to user queries, generated by the GPT model based on the relevant context found in the processed texts.

Questionnaire:

How are you feeling emotionally at this moment?

Is there anything on your mind that's causing you stress or worry?

What positive or negative experiences have you had today?

Are you feeling physically comfortable or uncomfortable right now?

Do you feel like you have the support you need from those around you?

Console Output:

Lab Report Analyser:

Libraries used:

-os: Provides a way of using operating system dependent functionality like reading or writing to the file system.

-PdfReader: Used to read and extract text from PDF files.

-SentenceTransformer: A library from sentence-transformers used to create embeddings from text.

-faiss: A library for efficient similarity search and clustering of dense vectors.

-openai: Used to interact with OpenAI's GPT models for generating responses.

-streamlit: A framework for creating web applications in Python.

What the code is trying to achieve:

The Lab Report Analyser component of the code focuses on interpreting complex medical laboratory reports. Users upload PDF files of their lab reports, and the system extracts and processes the textual data within these documents. Upon receiving a query related to specific lab results, the system searches the processed data to provide explanations about what each lab result signifies, including normal ranges and potential implications for the user's health. This feature is designed to demystify often confusing medical jargon and numerical data, enabling users to better understand their health status and any necessary actions based on their lab results.

Output expected, format and structure:

Processed Texts: The extracted text from the uploaded PDF files.

Vector Store: A searchable index created from the text embeddings.

Contextual Responses: Answers to user queries, generated by the GPT model based on the relevant context found in the processed texts.

Chat History: A record of the conversation between the user and the assistant, displayed in the web application.

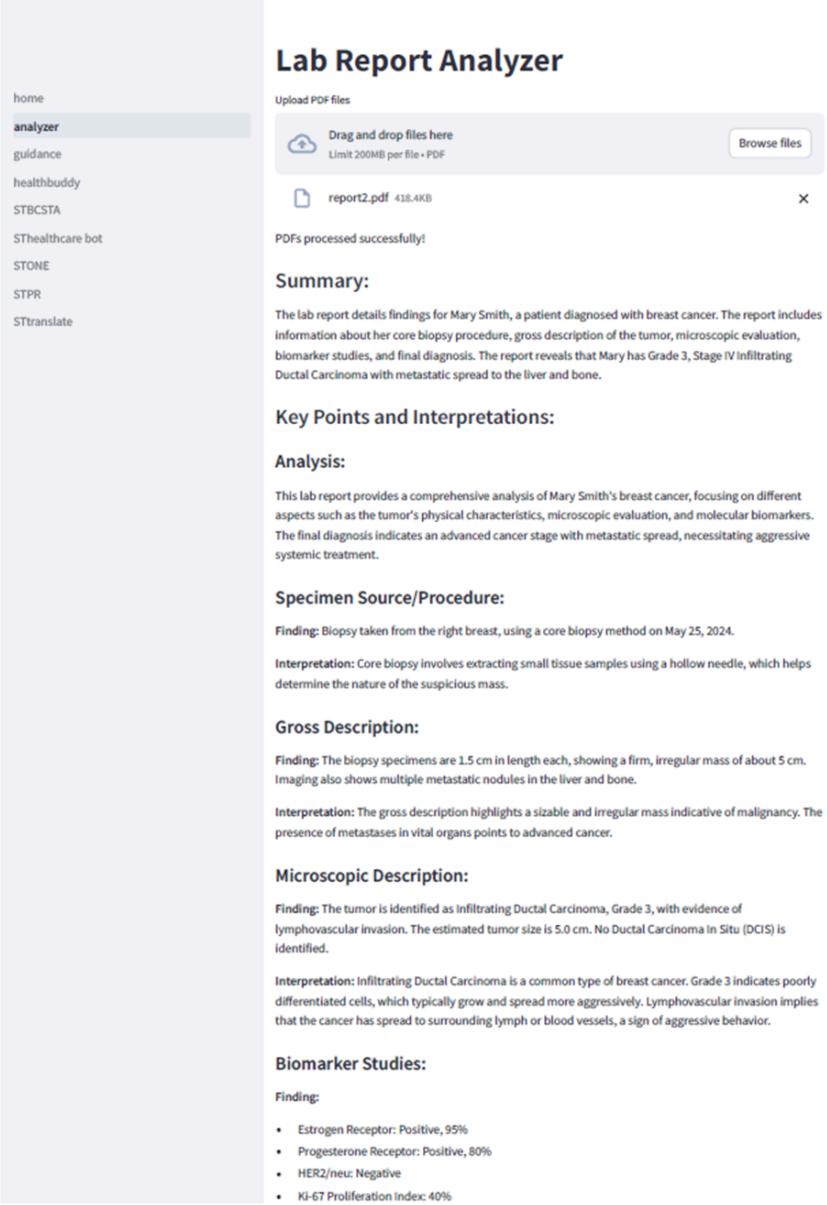
Features:

Input: PDF files containing lab reports and user queries about lab results.

Output: Detailed explanations about lab results, including what each result means, normal ranges, and potential health implications.

Prompt: "Explain the lab results in the given report and provide insights on what each result indicates."

Console Output:



- p53: Mutant type
- BRCA1/2: Negative for deleterious mutations

Interpretation:

- **Estrogen and Progesterone Receptor Positive:** Indicates the cancer is hormone receptor-positive, making hormone therapy a viable treatment option.
- **HER2/neu Negative:** Suggests that HER2-targeted therapies like trastuzumab (Herceptin) are not applicable.
- **Ki-67 Index 40%:** Indicates a high proliferation rate, suggesting that the cancer cells are dividing rapidly.
- **p53 Mutant:** p53 mutations are often associated with more aggressive cancers.
- **BRCA1/2 Negative:** Indicates no inherited mutation for breast cancer susceptibility, but the familial risk could still exist due to other genetic factors.

Other Studies:

Finding: Lymph node status not applicable due to presence of metastatic disease.

Interpretation: The metastatic spread to distant organs makes lymph node evaluation less relevant for staging but important for understanding the extent of the disease.

Final Diagnosis:

Finding: Grade 3, Stage IV Infiltrating Ductal Carcinoma, Luminal B subtype.

Interpretation: Stage IV signifies advanced cancer with metastasis beyond the breast. Luminal B subtype typically has a higher proliferation rate and may be treated with hormone therapy and chemotherapy.

Explanation:

- **Specimen Source/Procedure:** The biopsy was taken from the right breast to analyze the suspicious mass. This procedure is crucial for diagnosing the type of breast cancer.
- **Gross Description:** Describes the physical appearance of the biopsy sample, emphasizing the large size of the tumor and the presence of metastases.
- **Microscopic Description:** Looks at the cellular level, identifying the type of cancer, its grade, and signs of aggressive spread (lymphovascular invasion).
- **Biomarker Studies:** These tests identify specific proteins and genetic mutations in the cancer cells, guiding treatment options.
- **Final Diagnosis:** Summarizes the cancer's type, grade, stage, and subtype, providing a holistic view of the disease's extent and aggressiveness.

Suggested Treatment Plans:

1. **Hormone Therapy (e.g., Tamoxifen or Aromatase Inhibitors):**
    - Helps block hormones that fuel cancer growth.
    - Particularly effective due to positive estrogen and progesterone receptors.
2. **Chemotherapy (e.g., Docetaxel, Doxorubicin):**
    - Targets and kills rapidly dividing cancer cells.
    - Necessary due to the high proliferation rate indicated by the Ki-67 index.
3. **Targeted Therapy:**
    - While HER2-negative status rules out HER2-targeted drugs, other targeted treatments might be considered depending on further genomic profiling.
4. **Palliative Care:**
    - Focuses on symptom management and quality of life for advanced-stage cancer.
    - This could include pain management, nutritional support, and psychological counseling.
5. **Regular Monitoring and Imaging:**

- Essential to assess treatment response and adjust therapies as needed.
- Helps in the early detection of any further disease progression or treatment side effects.

Each suggested treatment aims to target specific aspects of Mary's cancer, combining to form a comprehensive and tailored strategy to manage her condition.

You:

what are biomarker studies?

what is immunotherapy

Immunotherapy is a type of cancer treatment that helps your body's immune system fight cancer. Unlike treatments like chemotherapy or radiation, which directly attack cancer cells, immunotherapy boosts or modifies your immune system's natural defenses.

Key Points:

1. **How It Works**:
   - It helps the immune system recognize and destroy cancer cells.
2. **Types**:
   - **Checkpoint Inhibitors**: These drugs help the immune system recognize and attack cancer cells.
   - **CAR T-cell Therapy**: This involves modifying a patient's T-cells (a type of immune cell) to better target cancer cells.
   - **Cancer Vaccines**: These vaccines help the immune system learn to recognize and attack cancer cells.
3. **Benefits**:
   - Can target and kill cancer cells without harming normal cells as much.
   - Often fewer side effects compared to conventional treatments.
4. **Research**:
   - Ongoing studies are exploring new forms of immunotherapy, such as personalized vaccines and oncolytic virus therapy (using viruses to infect and kill cancer cells).

Summary:

Immunotherapy leverages and enhances the body's own immune system to fight cancer, offering a more targeted and often less harmful treatment option.

what are biomarker studies?

Biomarker studies are research investigations that identify and evaluate biological markers (biomarkers) to understand how the body functions in health and disease. In the context of cancer, biomarkers can help in several ways:

Key Points:

1. **Definition of a Biomarker**:
   - A biomarker is a measurable indicator of a biological state or condition, such as proteins, genes, or other molecules found in blood, tissues, or other body fluids.
2. **Purpose in Cancer**:
   - **Diagnosis**: Biomarkers can help diagnose cancer early by indicating the presence of cancerous cells.

Medication Analyser:

Libraries used:

-os: Provides a way of using operating system dependent functionality like reading or writing to the file system.

-PdfReader: Used to read and extract text from PDF files.

-SentenceTransformer: A library from sentence-transformers used to create embeddings from text.

-faiss: A library for efficient similarity search and clustering of dense vectors.

-openai: Used to interact with OpenAI's GPT models for generating responses.

-streamlit: A framework for creating web applications in Python.

What the code is trying to achieve:

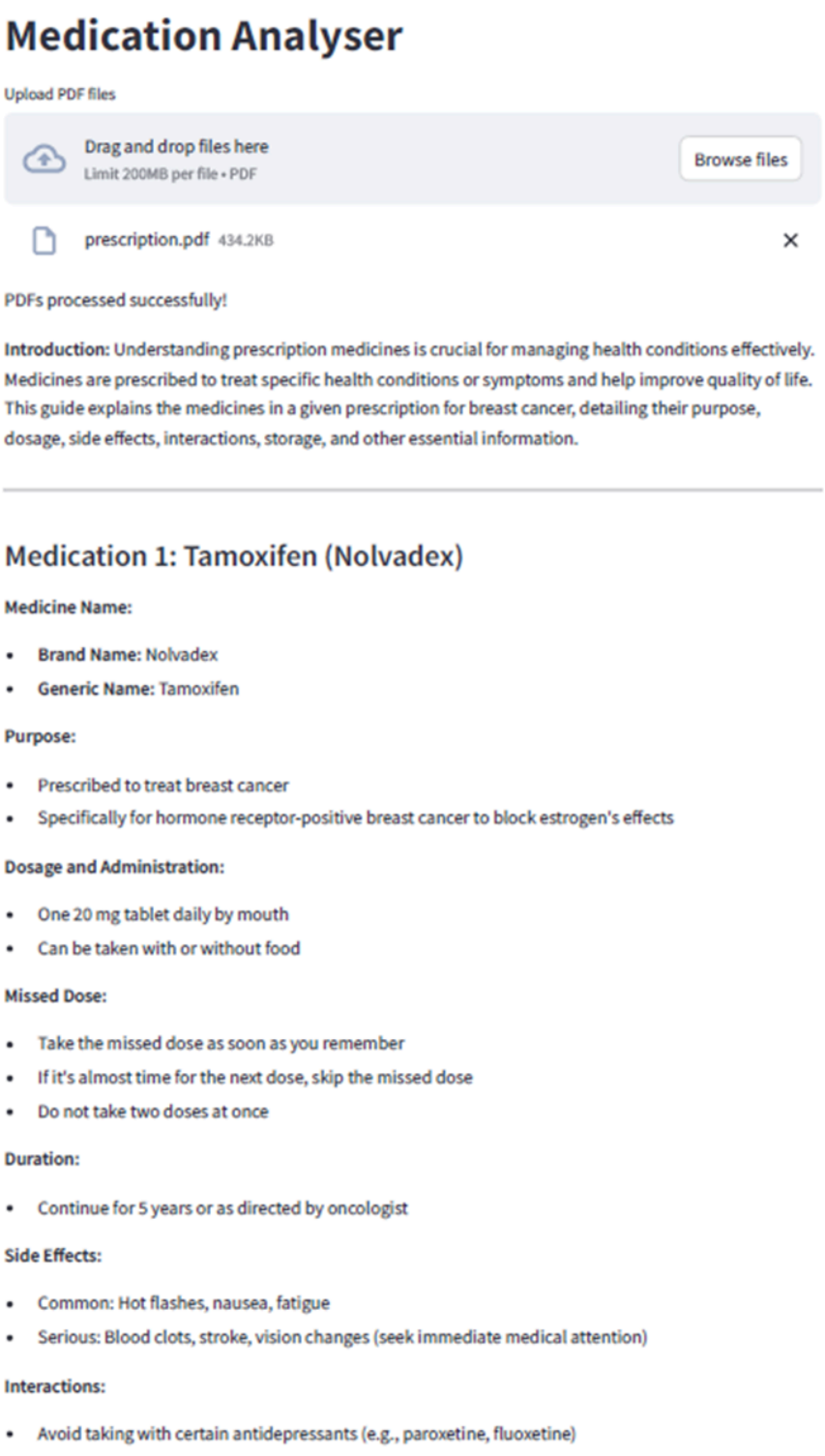
The code for the Medication Analyser aims to assist users in understanding the details of their prescriptions. It processes PDF files containing prescription information, extracts the text, and uses llm models to generate information. When a user queries about a specific medication, the system finds relevant information from the processed texts and generates a detailed response. This includes the medication's name, its purpose, dosage instructions, potential side effects, interactions with other substances, storage guidelines, and any necessary precautions. The goal is to empower users with comprehensive knowledge about their prescribed medications, promoting informed decision-making regarding their healthcare.

Features:

Input: PDF files containing prescription information and user queries about medications.

Output: Detailed explanations about medications, including their purpose, dosage, side effects, interactions, and precautions.

Console Output:



Medication Analyser

Upload PDF files

Drag and drop files here
Limit 200MB per file • PDF

Browse files

prescription.pdf 434.2KB

PDFs processed successfully!

Introduction: Understanding prescription medicines is crucial for managing health conditions effectively. Medicines are prescribed to treat specific health conditions or symptoms and help improve quality of life. This guide explains the medicines in a given prescription for breast cancer, detailing their purpose, dosage, side effects, interactions, storage, and other essential information.

Medication 1: Tamoxifen (Nolvadex)

Medicine Name:

- **Brand Name:** Nolvadex
- **Generic Name:** Tamoxifen

Purpose:

- Prescribed to treat breast cancer
- Specifically for hormone receptor-positive breast cancer to block estrogen's effects

Dosage and Administration:

- One 20 mg tablet daily by mouth
- Can be taken with or without food

Missed Dose:

- Take the missed dose as soon as you remember
- If it's almost time for the next dose, skip the missed dose
- Do not take two doses at once

Duration:

- Continue for 5 years or as directed by oncologist

Side Effects:

- Common: Hot flashes, nausea, fatigue
- Serious: Blood clots, stroke, vision changes (seek immediate medical attention)

Interactions:

- Avoid taking with certain antidepressants (e.g., paroxetine, fluoxetine)

- Inform your doctor of all medications you're taking

Storage:

- Store at room temperature, away from light and moisture

Precautions:

- Avoid activities like driving if you feel dizzy
- Inform doctor if you are pregnant, planning to become pregnant or breastfeeding

Medication 2: Doxorubicin (Adriamycin)

Medicine Name:

- **Brand Name:** Adriamycin
- **Generic Name:** Doxorubicin

Purpose:

- Chemotherapy agent used to treat breast cancer
- Works by slowing or stopping cancer cell growth

Dosage and Administration:

- 60 mg/m^2 administered intravenously once every 21 days

Missed Dose:

- Contact your healthcare provider for instructions

Duration:

- Typically 4 to 6 cycles, as directed by oncologist

Side Effects:

- Common: Hair loss, nausea, vomiting
- Serious: Heart problems, severe allergic reactions (seek immediate medical attention)

Interactions:

- Inform your doctor about all medications, especially those affecting the heart

Storage:

- Healthcare provider manages storage; not stored at home

Precautions:

- May lower ability to fight infections (avoid people with infections)
- Discuss pregnancy and breastfeeding with your doctor

Medication 3: Cyclophosphamide (Cytoxan)

Medicine Name:

- **Brand Name:** Cytoxan
- **Generic Name:** Cyclophosphamide