Question Answering System Technical Document

Introduction

The Question Answering System is designed to answer user queries using a combination of Elasticsearch for document retrieval and Hugging Face Transformers for natural language processing tasks.

Design Choices

Task 1: Document Retrieval (Elasticsearch)

Algorithm: Elasticsearch's full-text search capabilities are utilized for efficient document retrieval.

Libraries: Elasticsearch Python client is used to interact with the Elasticsearch server.

Task 2: Natural Language Processing (Hugging Face Transformers)

Algorithm: Transformer-based language models are employed for text understanding and question answering.

Libraries: Hugging Face Transformers library provides pre-trained models for NLP tasks.

Task 3: User Interface (Streamlit)

Design Patterns: Streamlit is used to create an interactive and user-friendly web interface for the question answering system.

Challenges and Solutions

Challenge: Integrating Elasticsearch with the NLP pipeline.

Solution: Elasticsearch queries are formatted to match the input requirements of the Transformers models.

Challenge: Ensuring real-time responsiveness in the web interface.

Solution: Streamlit's reactive framework is utilized to update UI elements based on user inputs and backend processing.

Conclusion

The Question Answering System successfully combines powerful information retrieval with advanced NLP techniques to provide accurate and efficient responses to user queries. Future improvements could focus on enhancing the system's scalability and handling a wider range of document types.

References

Elasticsearch Documentation: https://www.elastic.co/guide/index.html

Hugging Face Transformers Documentation: https://huggingface.co/transformers/