



The Superior University

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Lab Task 12

Building a Semantic Search-Based Chatbot Using Sentence Transformers and FAISS

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Overview:

This chatbot system uses **semantic similarity** to understand user queries and respond with relevant answers. Instead of relying on exact keyword matches, it uses **sentence embeddings** (via sentence-transformers) and **FAISS** (Facebook AI Similarity Search) for fast and efficient similarity search. It's especially helpful for domain-specific FAQs, like university admissions.

Key Components and Workflow:

Sentence Transformers:

The SentenceTransformer model encodes both user input and predefined questions into high-dimensional **vector embeddings**, capturing semantic meaning rather than surface-level keywords.

FAISS Index:

FAISS is used to store and search these embeddings. When a user asks a question, its vector is compared against the stored ones using **L2 distance**. The closest match is used to retrieve the corresponding answer.

Question & Answer Pool:

A set of predefined **questions** and their **answers** is used to train the chatbot. These cover common queries related to UMT admissions, including application procedures, fees, scholarships, and international student policies.

