# Python Project Report

## 1. Project Overview

This project presents an AI-powered educational chatbot designed for Class X Science students. It leverages the power of vector search using FAISS and language generation through Google Gemini API. Users can input questions based on the NCERT Class X Science syllabus and receive context-aware answers along with relevant image suggestions.

## 2. Technologies Used

- Streamlit (for UI)  
- FAISS (for semantic search)  
- Sentence Transformers (MiniLM)  
- Google Gemini API (for LLM)  
- Python  
- JSON (for metadata)

## 3. System Architecture

1. Load FAISS vector index and metadata.  
2. Convert user query into embeddings using sentence transformers.  
3. Search for relevant context using FAISS.  
4. Provide context and query to Gemini LLM for answer generation.  
5. If relevant, the model includes a diagram description which is used to generate an image.  
6. Answer and image are displayed on the Streamlit app.

## 4. Key Features

- Interactive Streamlit UI  
- Context-based Answer Generation  
- Diagram Description + Image Rendering  
- Integration of AI with Educational Content

## Libraries and Versions Used

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| Library | Version |
| streamlit | 1.32.0 |
| faiss | 1.7.4 |
| sentence-transformers | 2.2.2 |
| google-generativeai | 0.3.2 |
| numpy | 1.24.4 |
| json | builtin |
| Pillow | 10.2.0 |