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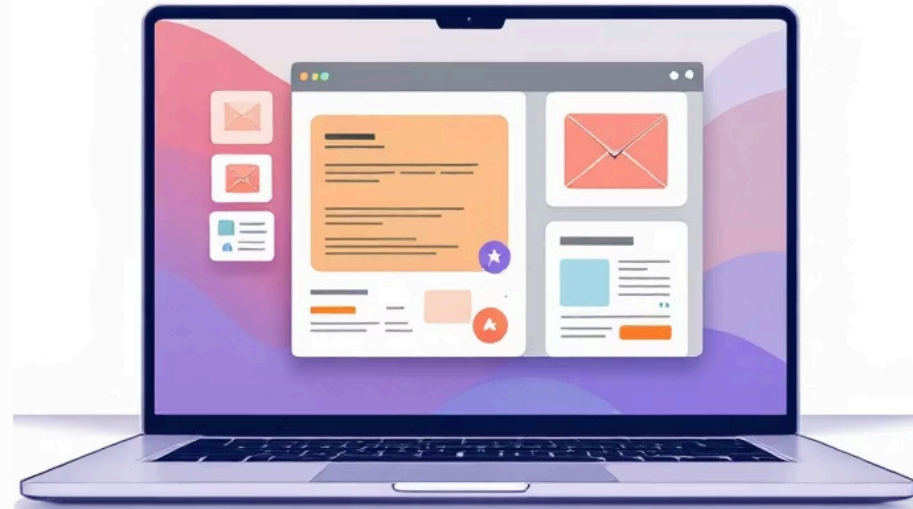
Roll no. – 123241210204

Year – 3rd Year(6th Sem)

Subject – Project Presentation for Generative AI

Scannify - AI-Powered PDF Scanner & Enhancer

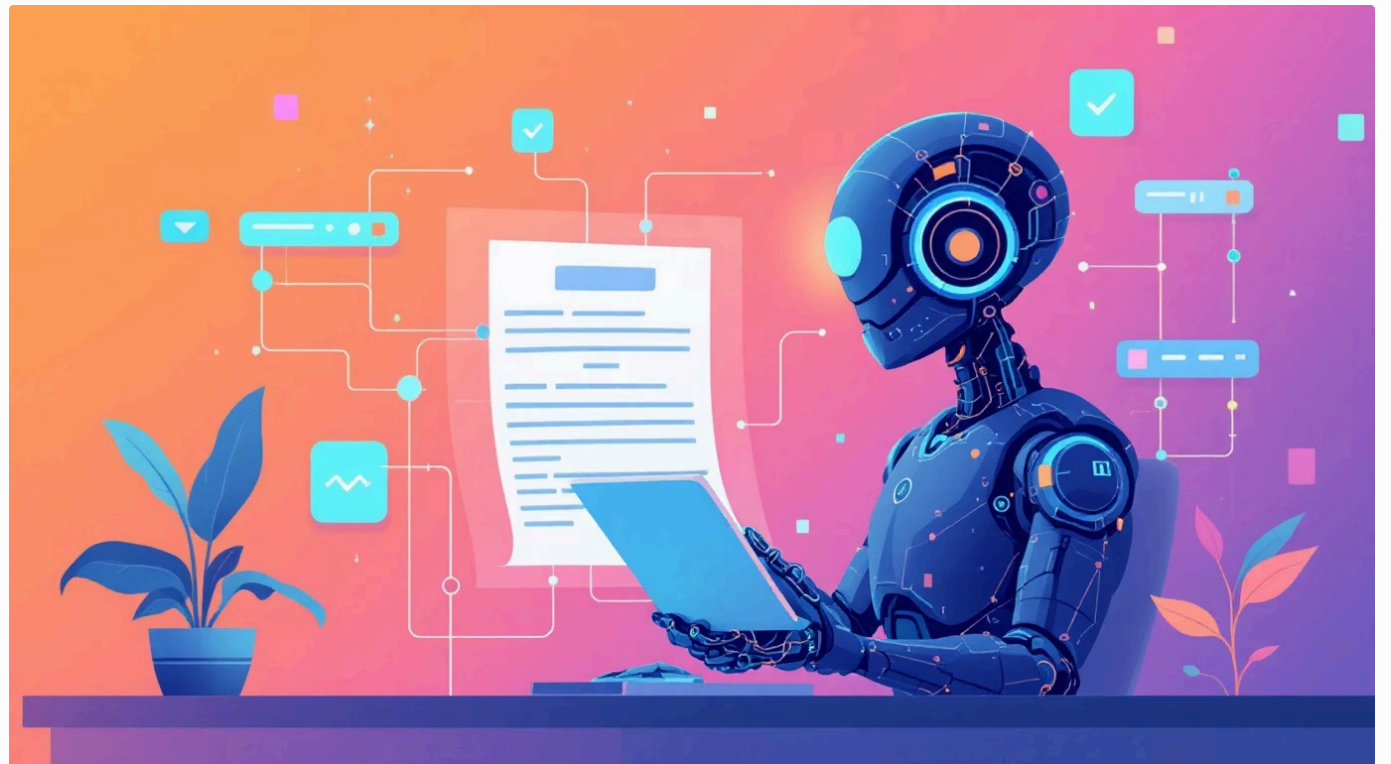
Complete project documentation for an intelligent PDF processing application that transforms documents into actionable insights using cutting-edge AI technology.



Project Overview

Scannify is an advanced AI-powered PDF document processing application that leverages Google's Gemini AI to scan, analyze, enhance, and interact with PDF documents. Built with Python and Streamlit, it provides a modern web interface for intelligent document processing.

The application combines multiple AI capabilities into a single platform, enabling users to extract insights, improve document quality, and engage in natural language conversations with their documents.



Key Value Proposition



Transform Documents

Convert any PDF into actionable insights and structured content



AI Enhancement

Content restructuring and quality improvement powered by Gemini AI



Interactive Q&A

Ask questions and get answers using RAG technology



Professional Output

Generate beautifully formatted enhanced PDFs

Core Features

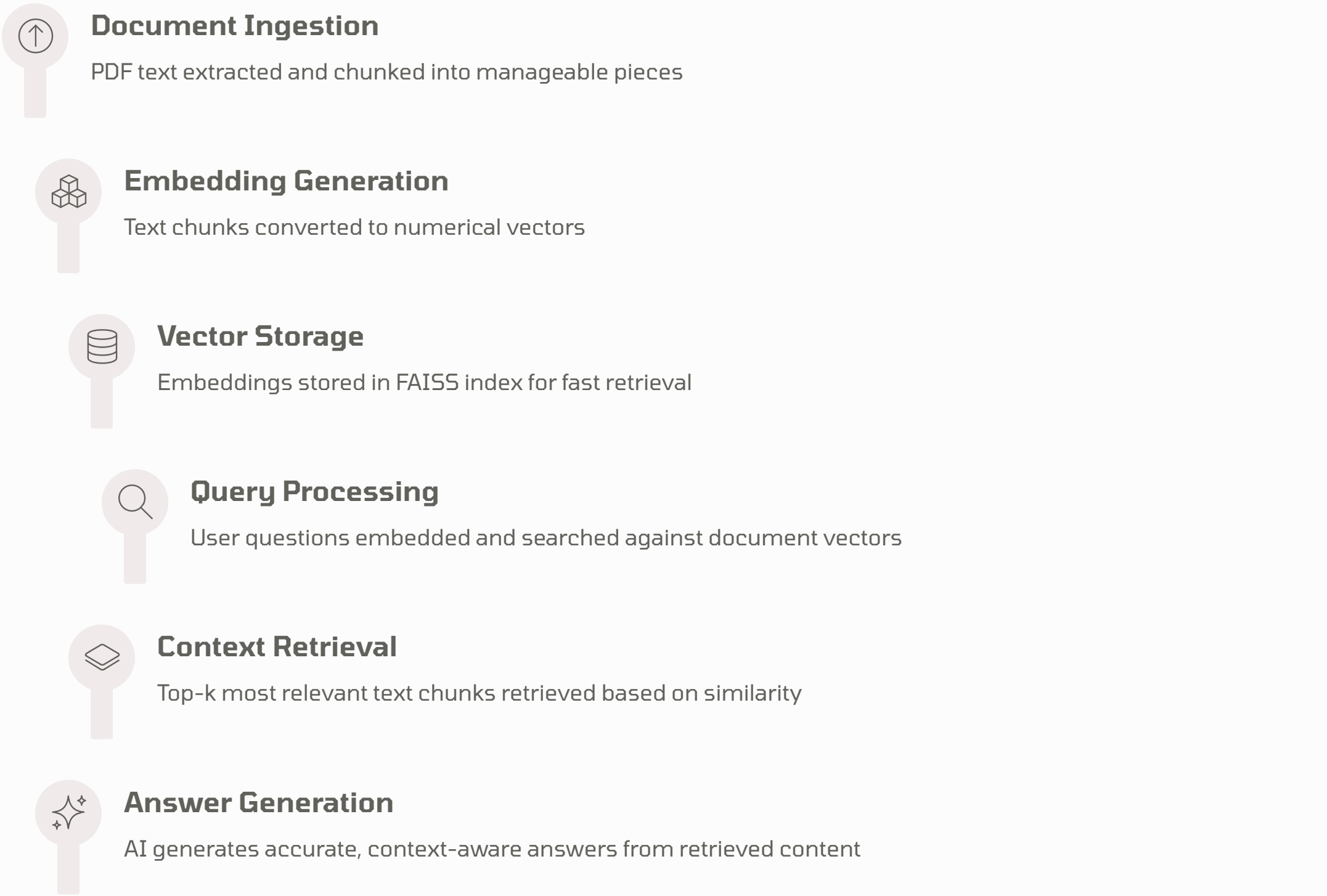
1	Smart PDF Scanning Extract text from any PDF document with multi-page support. Maintain document structure while displaying file information including size, type, and page count.
2	AI-Powered Analysis Get concise summaries, identify key points, assess writing quality, analyze sentiment, and receive actionable improvement recommendations with audience detection.
3	Content Enhancement Reorganize content structure, improve clarity and readability, transform into professional format, optimize conciseness, and generate executive summaries.
4	RAG-Powered Chat Find relevant information using semantic search, get context-aware answers, track chat history, use pre-built questions, and fall back to text search when needed.
5	Enhanced PDF Generation Create professionally formatted PDF output with custom styling, headers, and structured layout. Download with one click while keeping original and enhanced versions.
6	Advanced Tools Receive visual improvement suggestions, deep document insights, and RAG analytics to monitor search performance and relevance.

Technical Architecture

Technology Stack

Frontend	Streamlit (Python Web Framework)
AI Engine	Google Gemini AI (gemini-2.5-flash)
Vector Store	FAISS (Facebook AI Similarity Search)
PDF Processing	PyPDF2, pdfplumber
PDF Generation	ReportLab
Embeddings	Google Generative AI
Framework	LangChain
Language	Python 3.10+

RAG Pipeline



User Interface

Main Dashboard

Scannify features a clean, modern dark theme design with intuitive navigation. Users can drag and drop PDF files directly into the interface, with real-time processing progress indicators showing extraction and analysis status.

The tabbed interface organizes functionality into logical sections, making it easy to switch between document views, AI insights, and interactive features.

Sidebar Features

- Feature highlights and descriptions
- OCR capabilities information
- Processing options and settings
- Quick access to common actions



Tab Structure

01

Original Text

View extracted PDF content with formatting preserved

03

Enhanced Content

AI-improved document version with better structure and clarity

05

Download

Export enhanced PDF with professional formatting

02

AI Insights

Analysis results, recommendations, and document metrics

04

RAG Chat

Interactive Q&A interface with chat history tracking

06

Advanced Tools

Additional AI features and analytics

Key Capabilities



Document Processing

- Text extraction from PDFs
- Multi-page document support
- Large file handling (up to 200MB)
- Progress tracking during processing



AI Analysis

- Automatic content summarization
- Key points identification
- Writing quality evaluation
- Improvement suggestions
- Target audience detection



Content Enhancement

- Structure reorganization
- Clarity improvement
- Professional formatting
- Conciseness optimization
- Executive summary creation



Interactive Features

- Natural language Q&A
- Semantic document search
- Chat history tracking
- Quick analysis questions
- Context display for answers



Output Generation

- Enhanced PDF creation
- Professional formatting
- One-click download
- Multiple enhancement styles

Use Cases

Scannify serves diverse professional needs across multiple industries and use cases.

Business Professionals

Quickly analyze lengthy reports, extract key insights from contracts, generate executive summaries, and improve document clarity for presentations and meetings.

Students & Researchers

Summarize academic papers efficiently, extract key findings from research articles, ask specific questions about complex topics, and improve academic writing quality.

Content Creators

Enhance article structure and flow, improve readability for diverse audiences, receive AI-powered writing suggestions, and generate professional versions from drafts.

Legal & Compliance

Analyze lengthy legal documents, extract important clauses and sections, ask specific questions about terms, and generate compliance summaries.



Installation & Setup

Requirements

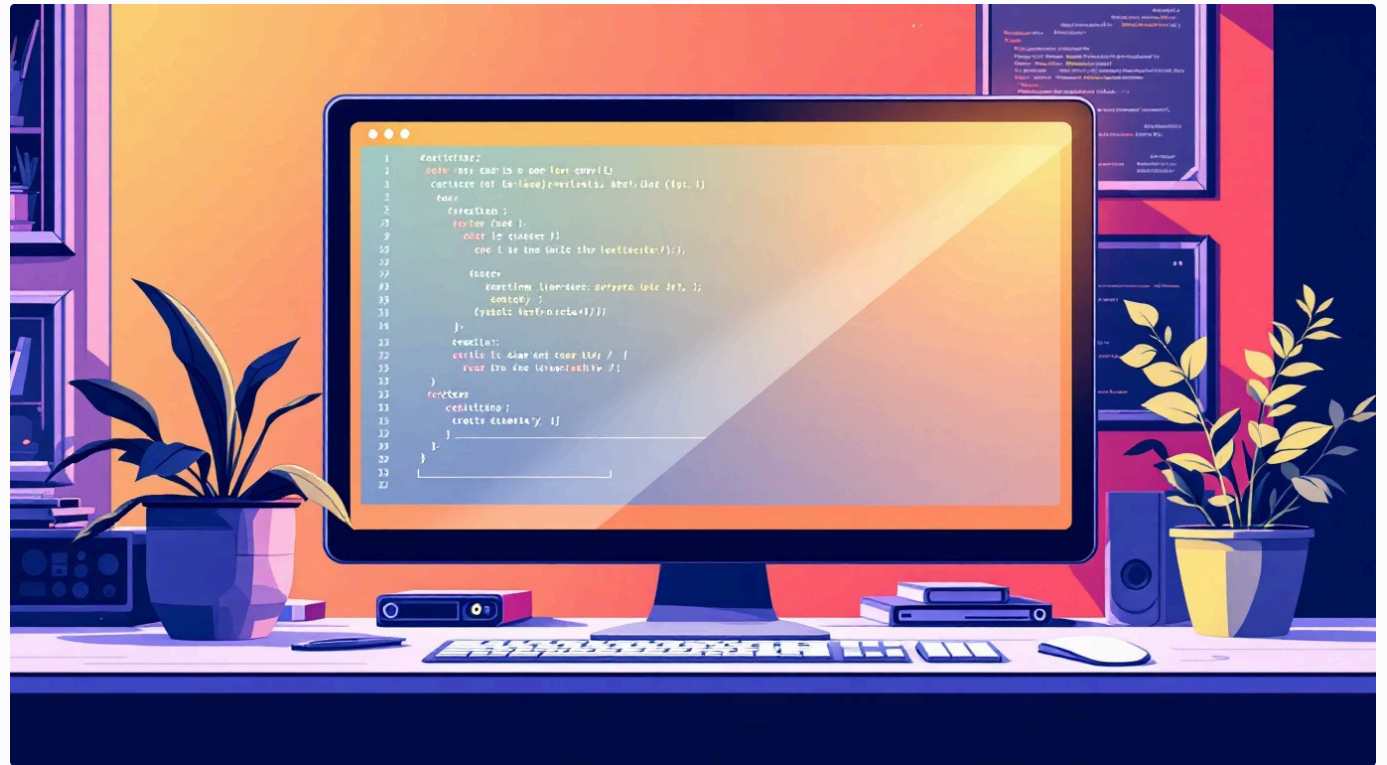
- **Python 3.10 or higher**
Latest Python version with pip package manager
- **Google AI API Key**
Authentication token for Gemini AI access
- **Internet connection**
Required for API calls and AI processing

Quick Start

```
# Install dependencies  
pip install -r requirements.txt
```

```
# Set API key in .env file  
GEMINI_API_KEY=your_api_key_here
```

```
# Run application  
python -m streamlit run main_app.py
```



Dependencies

- streamlit
- langchain
- langchain-google-genai
- faiss-cpu
- PyPDF2
- pdfplumber
- reportlab
- python-dotenv
- Pillow



API Integration

Google Gemini AI

Primary Model

`gemini-2.5-flash` - Fast, cost-effective processing for most document tasks

Fallback Models

`gemini-2.0-flash` and `gemini-2.5-pro` for automatic switching when primary model reaches quota limits

Intelligent Error Handling

Automatic model switching, retry logic, and graceful degradation to maintain functionality

Embeddings

Model Specification

`models/embedding-001` - Google's text embedding model for semantic search

Vector Dimension

768-dimensional vectors for accurate semantic similarity calculations

Purpose

Enables semantic search capabilities in the RAG pipeline for context-aware document analysis



Error Handling



Quota Management

Automatic detection of rate limits with smart model fallback system



User-Friendly Messages

Clear error messages with retry suggestions and wait times



Graceful Degradation

RAG falls back to simple text search when unavailable



Session State

Preservation of user state during recovery operations



Resilient Design: Scannify implements comprehensive error handling strategies including automatic model switching, embedding failure handling, API error recovery, and session state preservation to ensure reliable operation even under challenging conditions.