

02 MailMind - Smart Email Prioritizer & Gmail Assistant

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Project Description

Build **MailMind**, an intelligent email management system that transforms chaotic inboxes into organized, prioritized workspaces. This AI-powered Gmail assistant leverages advanced natural language processing to automatically prioritize emails, detect reply requirements, and generate draft responses through an intuitive Streamlit interface.

The system integrates **LangChain** for sophisticated prompt engineering, supports multiple AI providers (**Google Gemini, OpenAI, Anthropic Claude, or Groq**) for flexible language model inference, and Gmail APIs for seamless email management. Create a production-ready solution that revolutionizes email productivity through intelligent filtering, content summarization, and interactive chat-based email insights with support for Microsoft Office attachments and customizable time-based filtering.

Objectives

Core Email Management

- **Smart Prioritization:** Implement intelligent email scoring system that ranks messages from 1-10 based on importance and urgency
- **Promotional Filtering:** Develop automatic detection and filtering of promotional emails to focus on essential communications
- **Reply Detection:** Create AI-powered system to identify emails requiring responses and flag them appropriately
- **Draft Generation:** Build interactive draft response generator using advanced language models

Advanced Processing Features

- **Content Summarization:** Implement concise email summarization using your chosen AI provider and LangChain for quick content overview
- **Attachment Analysis:** Develop comprehensive Microsoft Office attachment reader supporting PDFs, DOCX, Excel, and other formats
- **Time-based Filtering:** Create customizable time frame selection for email filtering (1 hour to multiple days)
- **Interactive Chat Interface:** Build conversational AI system for natural language email queries and insights

Technical Excellence

- **Gmail API Integration:** Implement secure OAuth authentication and email fetching capabilities
- **Real-time Processing:** Ensure fast response times for email analysis and prioritization
- **Professional UI/UX:** Design clean, intuitive Streamlit interface with markdown formatting and visual hierarchy
- **Scalable Architecture:** Build modular system capable of handling large email volumes efficiently

Tools & Technologies

AI & Language Models (Choose One)

Provider	Integration	Purpose
Google Gemini	langchain-google-genai	High-performance language model with multimodal capabilities
OpenAI	langchain-openai	GPT-4/GPT-3.5-turbo for reliable email analysis and generation
Anthropic Claude	langchain-anthropic	Advanced reasoning and safe AI responses
Groq	langchain-groq	Ultra-fast inference for real-time email processing

Web Development & UI

Tool	Purpose
Streamlit 1.24.0	Interactive web application framework with real-time updates and chat interface
Pandas	Data manipulation and email metadata processing
Pillow	Image processing for email attachments and visual content

Email & Document Processing

Tool	Purpose
SimpleGmail	Gmail API wrapper for secure email fetching and management
MarkItDown	Microsoft Office document parsing and content extraction
Python-dateutil	Advanced date parsing and time frame filtering
Python-dotenv	Secure environment variable management for API credentials
LangChain 0.3.15	Advanced prompt management, chain orchestration, and NLP workflow automation

Project Type

Full-stack AI-powered productivity application specializing in:

- Email Intelligence & Automation
- Natural Language Processing
- Document Analysis & Summarization
- Real-time Web Applications

Key Features

Email Prioritization Engine

- **Automatic Gmail Integration:** Seamlessly fetch and process Gmail inbox contents
- **Promotional Email Filtering:** Intelligent detection and removal of marketing emails

- **AI-Powered Ranking:** Custom scoring algorithm using language models for importance assessment
- **Priority Dashboard:** Visual display of emails ranked by importance with clear scoring indicators

Reply Management System

- **Response Detection:** AI identification of emails requiring replies
- **Dedicated Reply Section:** Organized display of emails needing attention
- **Interactive Draft Generation:** One-click draft response creation with customizable templates
- **Context-Aware Responses:** Generated replies that understand email context and tone

Content Intelligence

- **Smart Summarization:** Concise email content summaries using your chosen AI provider
- **Clean Formatting:** Professional markdown presentation for enhanced readability
- **Key Information Extraction:** Automatic identification of important dates, names, and action items
- **Multi-language Support:** Content processing across different languages

Advanced Attachment Handling

- **Microsoft Office Support:** Comprehensive reading of PDFs, DOCX, Excel, PowerPoint files
- **Attachment Summarization:** AI-generated summaries of document contents
- **Visual Formatting:** Beautiful markdown presentation of attachment insights
- **Batch Processing:** Efficient handling of multiple attachments per email

Interactive Chat Interface

- **Conversational Email Queries:** Natural language interaction with inbox data
- **Real-time Insights:** Instant responses to questions about email contents
- **Contextual Understanding:** AI assistant with full knowledge of inbox contents
- **Query History:** Maintain conversation context for complex multi-turn interactions

Flexible Time Management

- **Customizable Time Windows:** Select from predefined ranges (1 Hour, 6 Hours, 24 Hours, 7 Days)
- **Dynamic Filtering:** Real-time email filtering based on selected time frames
- **Recency Prioritization:** Recent emails automatically weighted higher in importance scoring
- **Historical Analysis:** Ability to analyze email patterns over different time periods

User Workflow Example

Setup & Authentication

1. **Gmail Connection:** Secure OAuth authentication with Gmail API
2. **AI Provider Setup:** Configure chosen language model provider (Gemini/OpenAI/Claude/Groq)
3. **Configuration:** Environment setup with API keys and credentials
4. **Interface Launch:** Streamlit application initialization

Daily Email Management

1. **Inbox Sync:** Automatic fetching of new emails with metadata
2. **AI Processing:** Background analysis and scoring of email importance

3. **Priority Display:** Visual presentation of ranked emails with importance scores
4. **Attachment Analysis:** Automatic processing and summarization of attachments

Interactive Operations

1. **Chat Query:** "Show me urgent emails from this week"
2. **Draft Generation:** Click "Generate Draft" for selected email
3. **Content Summary:** Quick overview of long emails and attachments
4. **Time Filtering:** Adjust time range for focused email analysis

Technical Requirements

Core Dependencies

```
pip install streamlit==1.24.0
pip install pandas python-dateutil python-dotenv
pip install simplegmail langchain==0.3.15
pip install markdown "Pillow<10" --only-binary=:all:
```

AI Provider Dependencies (Choose One)

```
# For Google Gemini
pip install langchain-google-genai

# For OpenAI
pip install langchain-openai

# For Anthropic Claude
pip install langchain-anthropic

# For Groq
pip install langchain-groq
```

Environment Configuration

- **Gmail API Credentials:** OAuth2 client configuration
- **AI Provider API Key:** Language model access authentication
- **Environment Variables:** Secure credential management

System Architecture

- **Modular Design:** Separated components for email processing, AI analysis, and UI
- **Provider Abstraction:** Flexible AI provider switching without code changes
- **Caching Strategy:** Efficient data storage to minimize API calls
- **Error Handling:** Robust exception management for API failures and processing errors

Expected Outcome

Deliver a **production-ready email intelligence platform** that demonstrates:

Technical Mastery

- **Multi-Provider AI Integration:** Flexible language model provider implementation
- **API Integration:** Seamless Gmail and AI service connectivity
- **Real-time Processing:** Fast email analysis and response generation
- **Document Intelligence:** Advanced attachment processing capabilities
- **Conversational AI:** Natural language query processing

User Experience Excellence

- **Intuitive Interface:** Clean, professional Streamlit application
- **Responsive Design:** Fast loading and real-time updates
- **Visual Clarity:** Clear prioritization indicators and formatting
- **Accessibility:** Easy navigation and user-friendly interactions

Deliverables

- **Functional Application:** Complete email management system with all features
- **Source Code:** Well-documented, modular Python codebase
- **Deployment Guide:** Step-by-step setup and configuration instructions
- **Demo Materials:** Video walkthrough and feature showcase
- **Technical Documentation:** API integration guides and architecture overview

Success Metrics

Performance Indicators

- **Processing Speed:** Email analysis completed within 2-3 seconds
- **Accuracy:** 90%+ correct prioritization based on user feedback
- **Attachment Support:** Successfully process 95% of common Microsoft Office formats
- **User Engagement:** Average session duration indicating productive email management

Feature Completeness

- **Core Features:** All primary functionalities working seamlessly
- **Integration Stability:** Reliable Gmail API connectivity with error recovery
- **UI Responsiveness:** Smooth Streamlit interface with real-time updates
- **Chat Intelligence:** Accurate responses to natural language email queries

Production Readiness

- **Security:** Proper OAuth implementation and credential management
- **Scalability:** Efficient handling of large inboxes (1000+ emails)
- **Documentation:** Comprehensive setup and usage guides
- **Deployment:** Ready for cloud deployment and production use

This project showcases advanced AI integration skills while solving real-world productivity challenges, making it an excellent portfolio piece for demonstrating practical AI application development with flexible AI provider support.