

## Project Documentation: FRIDAY AI Assistant

### 1. Project Overview

This project implements **FRIDAY**, a voice-enabled AI personal assistant inspired by Iron Man's AI.

It leverages **LiveKit Agents** with Google's Realtime LLM, integrates tools like weather checking, web search, and Gmail-based email sending, while maintaining a consistent persona through prompts.

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### 2. Files and Their Purpose

- ◆ **.env (Environment Configuration) s**

Contains sensitive credentials such as:

- **LIVEKIT\_URL, API\_KEY, API\_SECRET** → To connect to a LiveKit cloud instance (real-time audio/video communication).
- **GOOGLE\_API\_KEY** → To authenticate with Google Realtime LLM APIs.
- **GMAIL\_USER, GMAIL\_APP\_PASSWORD** → For Gmail SMTP authentication when sending emails.

 Why: Credentials are stored securely here (not hardcoded in code). Loaded with dotenv in Python.

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- ◆ **agent.py (Main Entry Point)**

This is the **brain of the project**, where the AI assistant is defined and run.

Key Components:

1. **load\_dotenv(".env")** → Loads API keys and secrets.
2. **Assistant Class** (subclass of Agent):

- Uses **Google Realtime Model** with voice "Aoede".
- Personality is defined with **AGENT\_INSTRUCTION**.
- Tools available: `get_weather`, `search_web`, `send_email`.

### 3. **entrypoint Function:**

- Creates an `AgentSession`.
- Starts the session with:
  - **Video enabled**
  - **Noise cancellation (BVC)** for clear audio.
- Generates a first reply using `SESSION_INSTRUCTION`.

### 4. `if __name__ == "__main__":` → Runs the app with `agents.cli.run_app`.

⚡ Why:

- **LiveKit** handles real-time communication.
  - **Google Realtime Model** gives FRIDAY a voice + personality.
  - **Noise cancellation** improves audio quality in real-time conversations.
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### ◆ **prompts.py (Personality & Instructions)**

Defines **two prompt templates**:

1. **AGENT\_INSTRUCTION** → FRIDAY's persona (loyal, witty, confident).
  - Always speaks with authority (e.g., "On it, boss.").
  - Concise and futuristic.
2. **SESSION\_INSTRUCTION** → Defines session behavior.
  - Starts by introducing itself:  
*"Hi, I'm FRIDAY, your personal assistant designed by Mikey..."*

## ⚡ Why:

Prompts enforce **role consistency** so FRIDAY always speaks in character.

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### ◆ **requirements.txt (Dependencies)**

Lists all required Python packages:

- **livekit-agents**, **livekit-plugins-google**, **livekit-plugins-noise-cancellation** → Core framework & Google AI model integration.
- **mem0ai** → Likely for memory handling (not directly used here yet).
- **duckduckgo-search** → Web search functionality.
- **langchain\_community** → Provides tools like DuckDuckGoSearchRun.
- **requests** → To fetch weather API data.
- **python-dotenv** → To load .env securely.

## ⚡ Why:

Each library is specialized: LiveKit for real-time sessions, LangChain/DuckDuckGo for web tools, SMTP/Requests for external services.

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### ◆ **tools.py (Custom Tools)**

Defines **3 function tools** decorated with `@function_tool()`.

These can be invoked by the AI during conversations.

#### 1. **get\_weather(city)**

- Uses requests to fetch weather from wttr.in.
- Returns a short formatted string with current weather.

⚡ Why: Enables FRIDAY to answer weather-related questions.

#### 2. **search\_web(query)**

- Uses **DuckDuckGoSearchRun** to fetch results.

- Returns results as plain text.
  - ⚡ Why: Provides FRIDAY internet search ability without relying on Google.

### 3. `send_email(to_email, subject, message, cc_email=None)`

- Uses `smtplib` + Gmail credentials from .env.
- Sends email securely via TLS.
  - ⚡ Why: Lets FRIDAY compose and send real emails for the user.

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## 3. Flow of Execution

1. .env is loaded → API keys & credentials available.

2. **FRIDAY (Assistant class)** is created with:

- Personality (prompts.py)
- Google Realtime LLM (voice)
- Tools (tools.py)

3. **Session starts:**

- Connects to LiveKit (real-time voice/video).
- Noise cancellation enabled.
- FRIDAY introduces itself per SESSION\_INSTRUCTION.

4. **During conversation:**

- User requests (e.g., “Check weather in London”).
- FRIDAY invokes get\_weather tool.
- Responds in character: “*On it, boss. London is currently...*”

5. **On exit:** Session ends gracefully.

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## 4. Why Each Component is Used

- **LiveKit Agents** → Provides real-time AI-powered voice/video sessions.
  - **Google Realtime Model** → Gives natural voice output & AI reasoning.
  - **Noise Cancellation** → Ensures clarity in communication.
  - **Prompts** → Keep FRIDAY in-character (Iron Man-inspired assistant).
  - **Tools** → Extend AI beyond chat:
    - Weather (requests)
    - Web Search (DuckDuckGo + LangChain)
    - Email (SMTP + Gmail)
  - **.env + dotenv** → Secure handling of secrets.
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## 5. Possible Improvements

- Add **memory** (using mem0ai) so FRIDAY remembers past conversations.
- Implement **task scheduling/reminders**.
- Support **multi-language responses**.
- Add **GUI dashboard** for logs & email history.