

Job Application Assistant Agent (Capstone Project – Google x Kaggle AI Agents Intensive 2025)

A lightweight, dependency-safe AI Agent designed to help job seekers instantly analyze job descriptions, match skills, and generate tailored cover letters using their resume data.

This project is created as part of the **AI Agents Intensive (Nov 10–14, 2025)** by **Google & Kaggle** under the **Enterprise Agents Track**.

Project Overview

Applying for jobs is a repetitive and time-consuming process. Every job description must be manually read, compared with the resume, and tailored cover letters must be written.

This agent automates that entire workflow:

- Extracts skills from your resume
- Analyzes any job description
- Produces a similarity score
- Identifies matched & missing skills
- Generates a personalized cover letter
- Saves job applications as memory

This project is built to be **simple, fast, and fully runnable in Google Colab**, without heavy dependencies or GPU usage.

Features

1. Resume Parsing

- Reads resume PDF using pdfplumber
- Extracts meaningful text

2. Skill Extraction

- Uses a curated list of technical skills
- Detects skills present in both resume and JD

3. Resume ↔ Job Description Matching

- Calculates ATS-style similarity score
- Shows matched and missing skills

4. AI Cover Letter Generator

- Creates a clean, customizable cover letter
- Uses job description + resume context
- Perfect for fast applications

5. Application Memory

Stores analyzed JDs in:

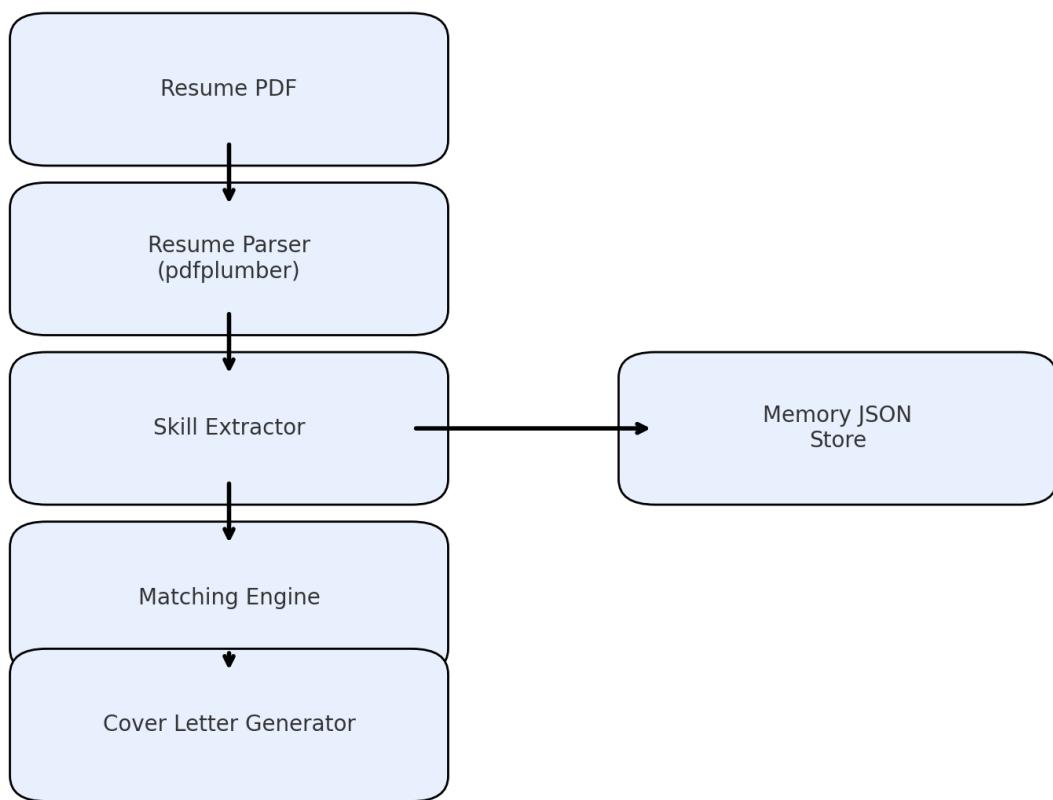
`/content/job_app_memory.json`

This acts like an agent's long-term memory.

6. Lightweight & Error-Free

- No transformers
 - No sentence-transformers
 - No Gradio (avoids dependency issues)
 - Works smoothly in Colab
-

□ Architecture



❖ Technologies Used

Feature	Technology
PDF Parsing	pdfplumber
Skill Extraction	Custom Python
Matching Logic	Keyword Intersection
Cover Letter	Template-based generator
Memory	JSON storage
Runtime Environment	Google Colab

📁 Project Structure

- 📁 job-application-assistant-agent
 - ├ capstone_job_agent.ipynb
 - ├ README.md
 - ├ job_app_memory.json (auto-created)
 - └ architecture.png (optional)

▶ How to Run in Google Colab

1 Upload the notebook

Open Colab → Upload capstone_job_agent.ipynb

2 Upload your resume

Upload your resume as:

/mnt/data/resume.pdf

or change the path in notebook:

```
RESUME_PATH = "/content/resume.pdf"
```

3 Run cells in order

The notebook will:

- Load your resume
- Extract skills
- Analyze sample job descriptions
- Generate cover letters

4 Analyze any JD

Use:

```
analyze_jd_and_save(  
    jd_text,  
    name="Your Name",  
    role="Role Title",  
    save=True  
)
```



Example Output

Similarity Result

```
{  
    "similarity_score": 66.67,  
    "matched_skills": ["java", "mysql", "git"],  
    "missing_skills": ["docker", "linux"],  
    ...}
```

}

Cover Letter (Generated)

Dear Hiring Team,

I am writing to express my interest in Software Engineer. I am Gideon Kingsly Raj.

From my resume: Educated professional with knowledge in Java, MySQL, HTML/CSS...

From the JD: We are hiring a Software Engineer with Java, Spring Boot...

Relevant skills: java, mysql, git.

Thank you.

Gideon Kingsly Raj

❖ Why This Project Fits the Kaggle Capstone Requirements

This project fulfills at least **three major agent concepts**:

✓ Tools

- PDF parsing
- Custom skill extraction
- Memory saving

✓ State & Memory

- Long-term storage in JSON

✓ Multi-Agent Workflow (Conceptual)

- Resume parser
- Skill extractor
- Matching logic
- Cover-letter generator

✓ Enterprise Agent Use Case

Directly improves job-application workflows.

About the Author

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Created as part of Google x Kaggle AI Agents Intensive 2025.

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