**Project Title:**

"Job Recommendation System using CrewAI and Local LLaMA3"

**Problem Statement:**

In the dynamic and competitive job market, identifying relevant job opportunities, matching user skills with market demand, and providing personalized career advice is a time-consuming process. Manual job hunting often lacks intelligent filtering, skill analysis, and data-driven forecasting.

This project aims to build a GenAI-based Job Recommendation Assistant using:

CrewAI Agents

Local Ollama (LLaMA3) as the LLM backend

Live web scraping from job boards **(Website :- https://remoteok.com/remote-python-jobs)**

Resume parsing for user skill extraction **(Pass Resume in PDF or Text Format)**

Market trend detection

Skill gap analysis

The system will provide end-to-end intelligent job recommendations using a team of collaborative AI agents.

**Step-by-Step Breakdown:**

**Step 1: Job Data Collection**

Goal: Extract real-time job postings from a job portal like RemoteOK.

Method: Use requests + BeautifulSoup to scrape Python developer jobs.

Output: A DataFrame of jobs with fields like title, company, tags, and description.

**Step 2: Resume Parsing**

Goal: Analyze a user-provided resume (in .txt or .pdf format).

Method: Use PyPDF2 or basic file reading to extract plain text.

Output: A list of extracted keywords (skills) from the resume.

**Step 3: Define Specialized Tools**

**Each tool answers one question:**

**extract\_resume\_skills:** Extract top keywords from resume.

**match\_jobs:** Match resume with top 5 job descriptions.

**skill\_gap:** Find skills required in jobs but missing from resume.

**trending\_skills:** Analyze job tags to forecast trending skills.

**Step 4: Design AI Agents Using CrewAI**

**Each agent has a specific role, a goal, and access to only the tool it needs:**

ResumeAnalyzer → Reads and extracts skills from resume.

JobMatcher → Matches top 5 jobs using job descriptions.

SkillGapAgent → Finds skill gaps between resume and jobs.

TrendForecaster → Analyzes job tags for in-demand skills.

RecommenderAgent → Synthesizes outputs and generates a final report.

**Step 5: Define Tasks**

**Each agent is assigned a task such as:**

Extract resume skills

Find best job matches

Detect skill gaps

Forecast top trending skills

Summarize and recommend action plan

Tasks are executed sequentially using CrewAI.

**Step 6: Generate Final Report**

The final output includes:

List of resume skills

Top 5 matching jobs

List of missing skills

Trending job market skills

Career recommendation summary

**Questions**

**Resume & Skill Extraction**

What are the top skills extracted from my resume?

Analyze my resume and summarize key strengths.

List technical and soft skills found in my resume.

What does my resume say about my job readiness?

Evaluate the top 10 most frequent keywords in my resume.

**Job Matching**

Find 5 remote jobs matching my resume in Python development.

Suggest the best job roles for me based on my resume.

Are there any job opportunities that match my current skills?

Recommend junior-level jobs based on my resume.

Match me to the top jobs in backend development.

**Skill Gap Analysis**

What skills are missing in my resume for Python jobs?

Identify the top 5 skills I lack for current job trends.

What do job listings expect that I don’t have in my resume?

Compare my resume with the latest job tags and list gaps.

List technical skills in demand that are not in my resume.

**Market Trend Forecasting**

What are the top 5 trending skills in the job market today?

Which tech stacks are in high demand currently?

Identify upcoming skills I should learn in 2025.

What technologies are employers hiring for most now?

Are there any rising trends in remote tech jobs?

**Domain-Specific Recommendations**

Match my resume to jobs in the data science domain.

Suggest skill improvements for a career in AI/ML.

What skills should I add to become a full stack developer?

Recommend job paths in cloud computing based on my resume.

What are the missing skills for DevOps jobs?

**Custom, Strategic Queries**

Analyze my resume and tell if I’m ready for senior roles.

How competitive is my resume for remote tech jobs?

Based on trends and gaps, which 3 courses should I take?

Recommend companies hiring for my skillset.

Which 3 job roles fit me best based on resume + job trends?