Infosys Springboard Virtual Internship 6.0 Completion Report

Team Details <Do not mention any personally identifiable information like email ID, institute details, mobile phone number etc.>

Batch Number: SkillMatch Resume Matcher and Skill Recommender

Start date : 13-09-2025

Names:

1. Manikanta Rashik Bonda
2. Om Kulkarni
3. Omkar Yadav
4. Palash Gupta
5. Ravulu Bindu Priya

Internship Duration: 40-day (12 Weeks)

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1. Project Title

SkillMatch Resume Matcher and Skill Recommender

2. Project Objective

SkillMatch Resume Matcher and Skill Recommender is an AI-driven platform designed to automate resume screening and skill evaluation.
Its core objectives are to:

- **Match candidate profiles to job requirements** using machine learning–based similarity analysis.
- **Identify skill gaps** within resumes by comparing extracted competencies with employer expectations.
- **Recommend tailored upskilling paths** by suggesting relevant learning resources for missing skills.
- **Enable recruiters to shortlist faster** by providing ranked candidate lists backed by analytical scoring.
- **Support job seekers** with career insights and guidance on competencies that improve employability.

The project enhances manual hiring workflows by replacing subjective screening with **data-driven, fair, and scalable assessments**, while simultaneously acting as a **career improvement assistant** for applicants.

3. Project description in detail

The SkillMatch Resume Matcher and Skill Recommender platform is an AI-powered web application designed to automate and enhance recruitment workflows and candidate profiling.

The system allows recruiters to upload multiple resumes (PDF format) alongside a job description, after which it:

1. **Extracts textual data from resumes using PyPDF2.**
2. **Performs text preprocessing and skill keyword detection using custom NLP logic.**
3. **Generates vector representations of text using TF-IDF vectorization.**
4. **Computes similarity between job expectations and applicant resumes through cosine similarity, producing a matching score.**
5. **Highlights:**
    - **Skills possessed by a candidate**
    - **Missing skills compared to recruiters' expectations**
6. **Provides smart recommendations via curated learning links for missing skills (Udemy, Coursera).**
7. **Ranks resumes automatically and presents results visually using:**
    - **Donut score charts**
    - **Color-coded score indicators**
    - **Skill insight grids**
8. **Enhances usability through dark/light mode switching and chatbot support scope.**

This project simultaneously supports recruiters (via faster hire decisions) and job seekers

(via guidance on skill improvement), aligning AI-driven assessment with personalized upskilling pathways.

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4. Timeline Overview

Week	Activities Planned	Activities Completed
Week 1	Requirement study, use-case mapping	Problem definition refined, objectives finalized
Week 2	Tech stack evaluation, architecture planning	Django environment setup completed
Week 3	Resume upload + file handling implementation	File upload and storage verified
Week 4	Resume text extraction logic	PDF parsing & text extraction module built
Week 5	NLP-based skill extraction method	Skill extraction using keyword matching developed
Week 6	Machine learning model development using TF-IDF	Cosine scoring + ranking working
Week 7	UI layout wireframe, basic frontend pages	Core UI integrated with backend
Week 8	Dashboard design (donut charts + scoring visuals)	Score visualization functioning
Week 9	Skill recommendation engine + provider links	Recommendations displayed dynamically
Week 10	Dark/Light theme switch, UI polishing	Theme toggle working across UI
Week 11	Testing (functional + usability), debugging	Integrated testing with sample resumes
Week 12	Documentation, report writing, future enhancements	Project ready for evaluation

5a. Key Milestones

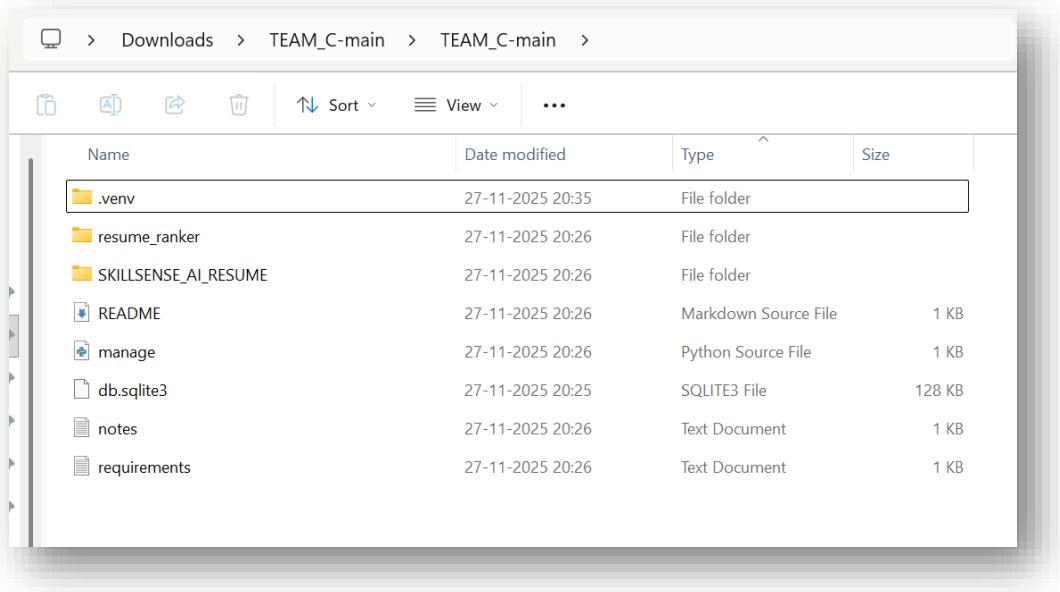
Milestone	Description	Date Achieved
Project Kickoff	Defined project objectives, scope, responsibilities, and success criteria.	**04 Nov 2025**
Prototype / First Draft	Developed initial working prototype covering resume parsing, matching logic, and UI flow.	**11 Nov 2025**
Mid-Term Review	Conducted review to evaluate progress, refine feature priorities, and implement improvement actions.	**25 Nov 2025**
Final Submission	Completed and submitted the fully functional SkillMatch system with reporting and documentation.	**03 Dec 2025**
Final Presentation	Delivered demonstration highlighting system architecture, functionality, results, and impact.	**05 Dec 2025**

5b. Project execution details

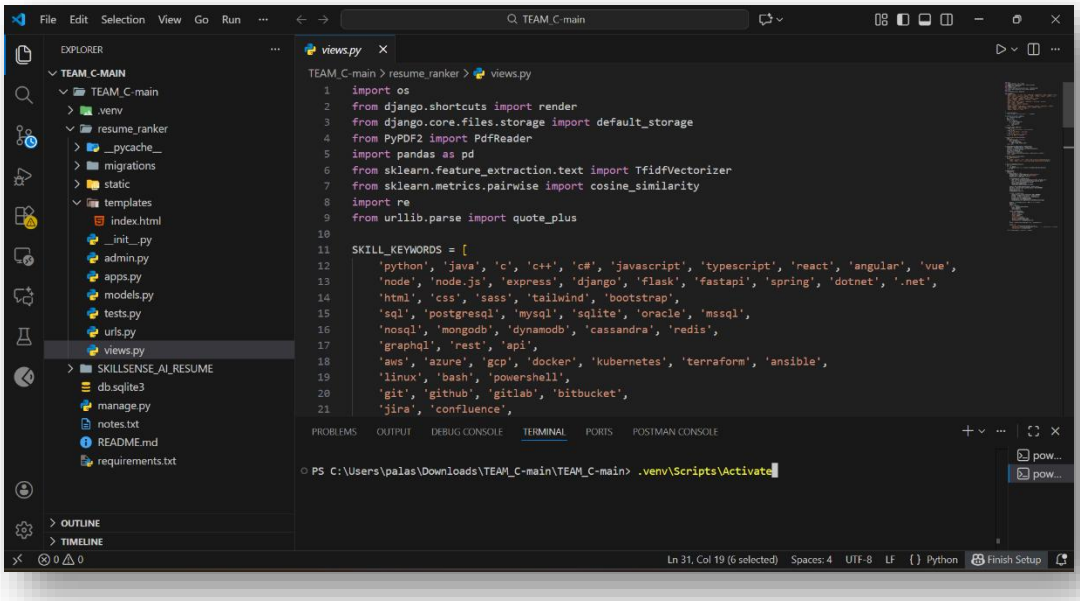
The execution of the SkillMatch system followed a structured and iterative development approach.
The project commenced with **requirement analysis**, defining objectives, problem scope, and mapping AI/ML applicability to resume screening. Sample job descriptions and resumes were collected to simulate real-world hiring scenarios.
Next, **text processing and knowledge extraction** modules were implemented. Resume text was parsed using PDF extractors, normalized, and scanned for skill keywords. Job descriptions were analyzed to identify required competencies. NLP techniques such as **text cleaning, normalization, stop-word removal, and keyword mapping** were applied to enhance accuracy.
A similarity-based scoring engine was built using **TF-IDF vectorization and cosine similarity**, which quantified match strength between candidate resumes and job expectations. This engine was integrated with a **skill gap detector** that identified missing skills and a recommendation module that suggested targeted learning resources for improvement.
Parallelly, a user-friendly **web interface was developed using HTML, CSS, and Django views**, enabling file uploads, scoring visualization, dark/light theme switching, and dashboard-style analytics including donut-based score meters and categorized skill cards.
The system underwent iterative testing with multiple resumes to validate extraction accuracy, scoring alignment, and UI experience. Errors were debugged, UI feedback loops were incorporated, and feature enhancements—such as theme toggling and chatbot provision scope—were added.
Finally, the project was refined, documented, and presented, demonstrating its ability to support **recruiters with automated shortlisting** and **job seekers with skill improvement insights**, achieving its intended outcomes.

6. Snapshots / Screenshots

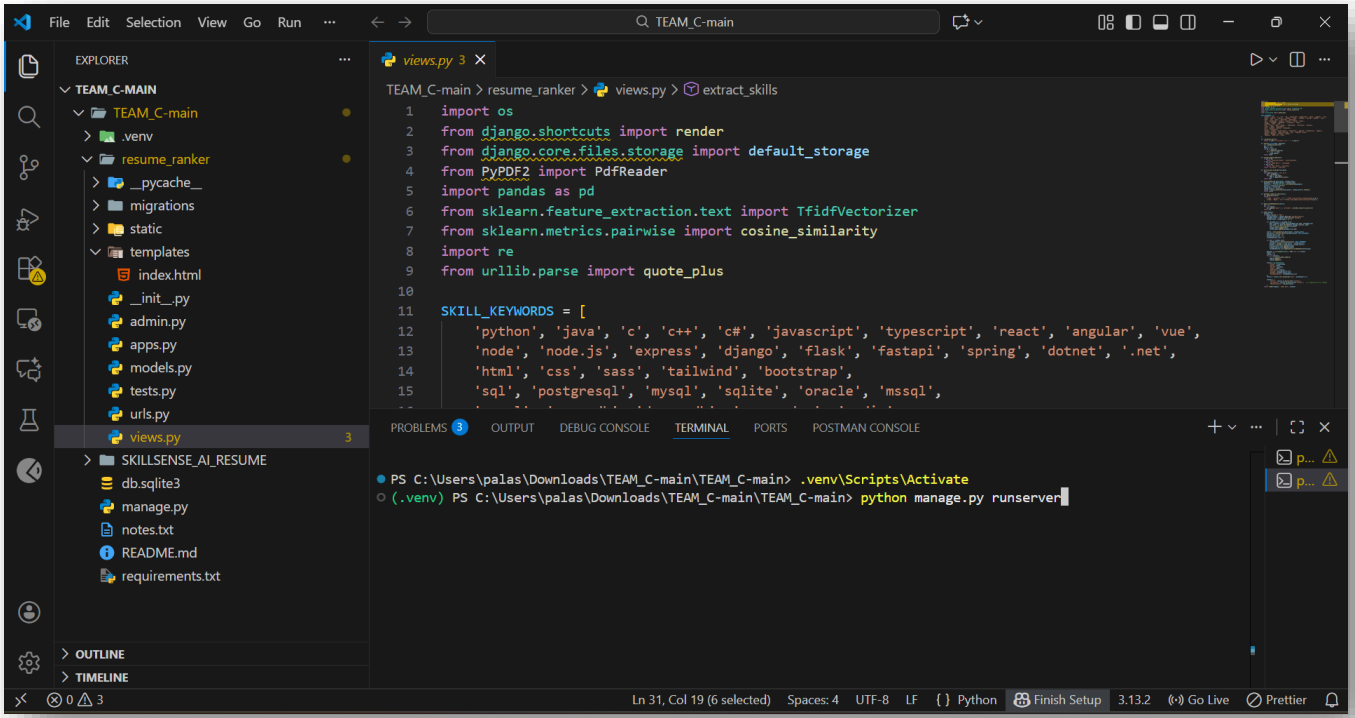
Opening the project folder containing all the main files such as *app.py, matcher.py, templates,* and *static*.



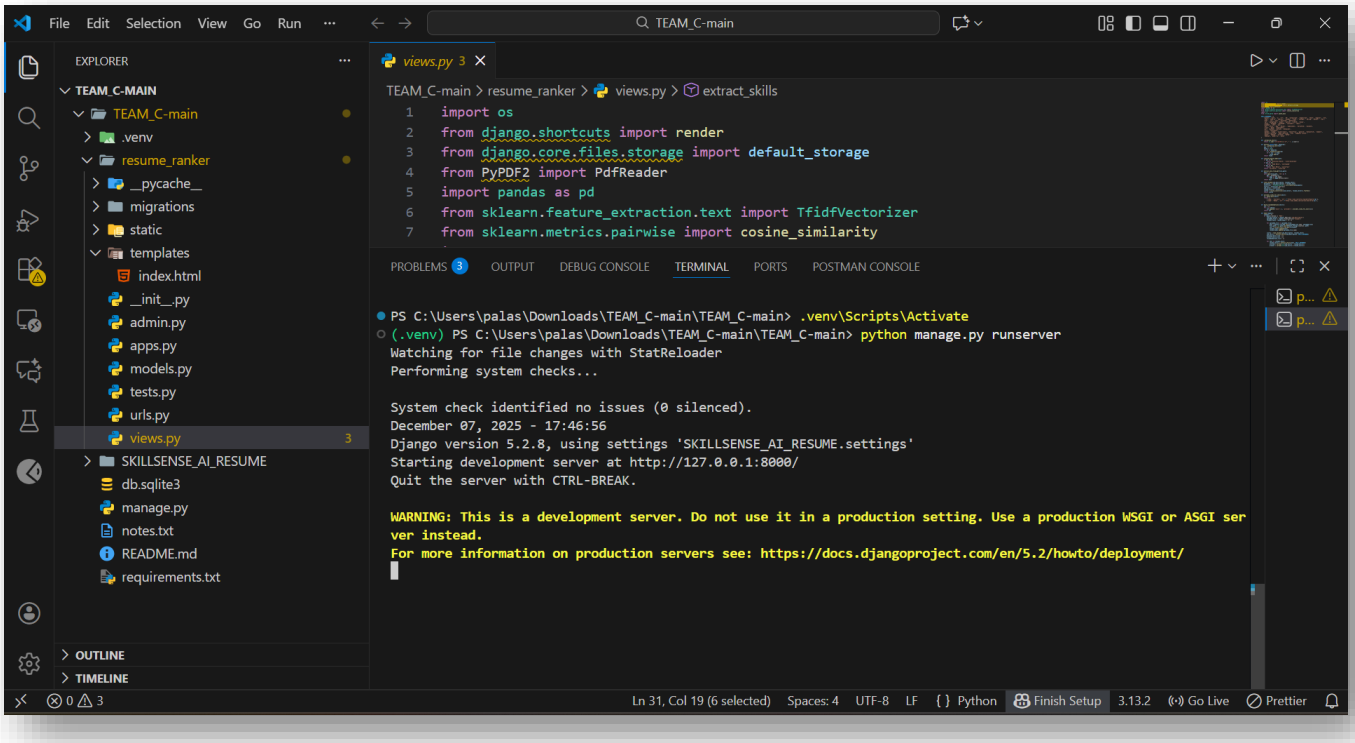
Opening the *app.py* file in VS Code to view the main Flask application code.



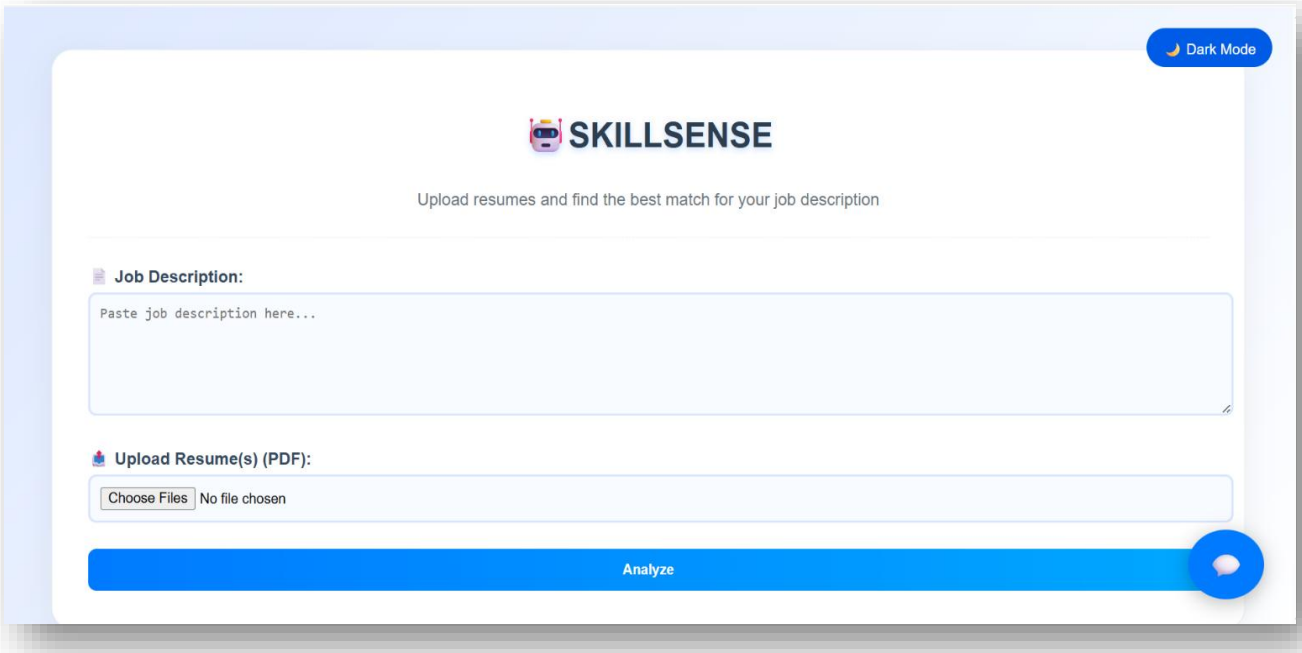
Running the Flask app using the command python app.py in the terminal.



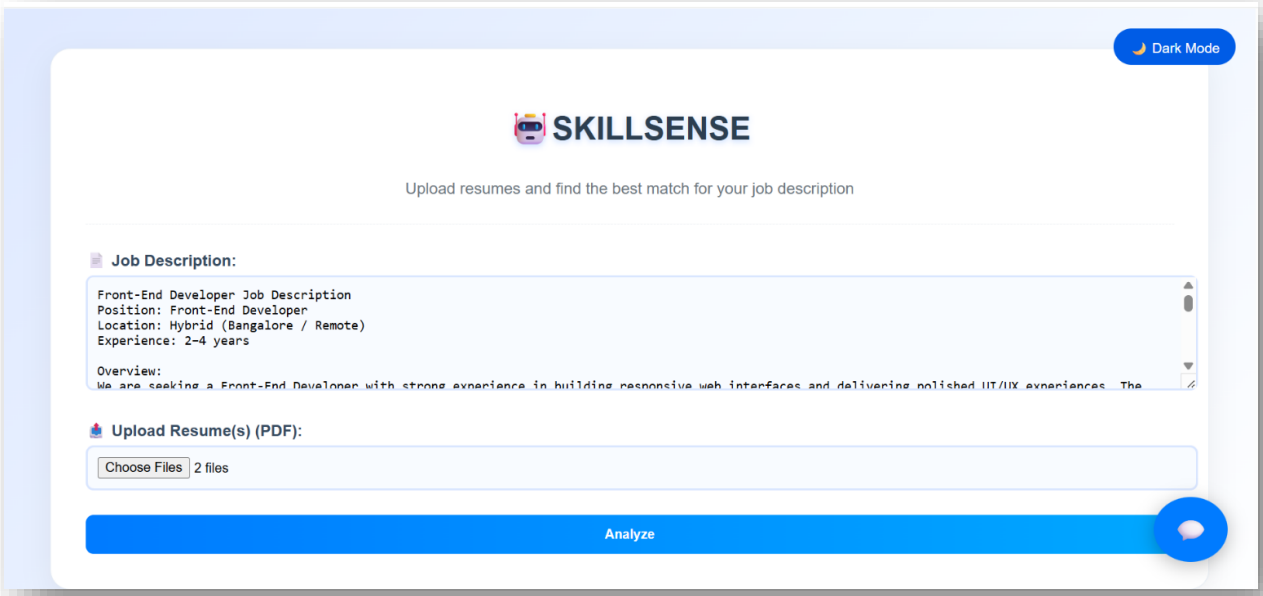
Copying or clicking the local server link provided by Flask (http://127.0.0.1:8000).

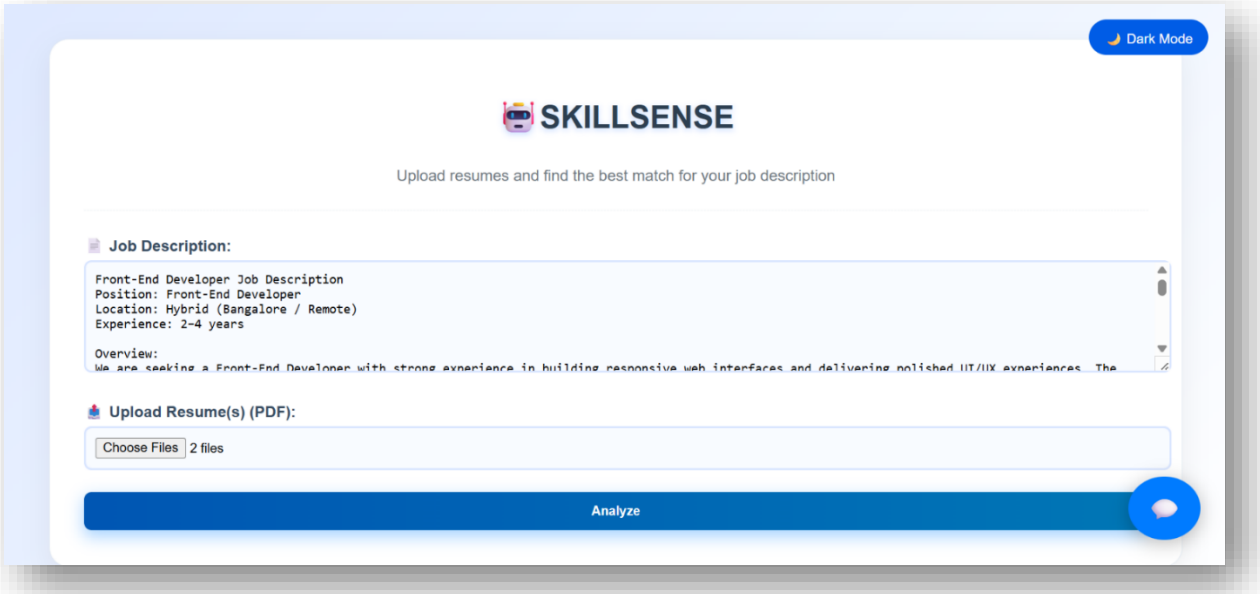


The home page of the SkillMatch Resume web application appears on the browser.

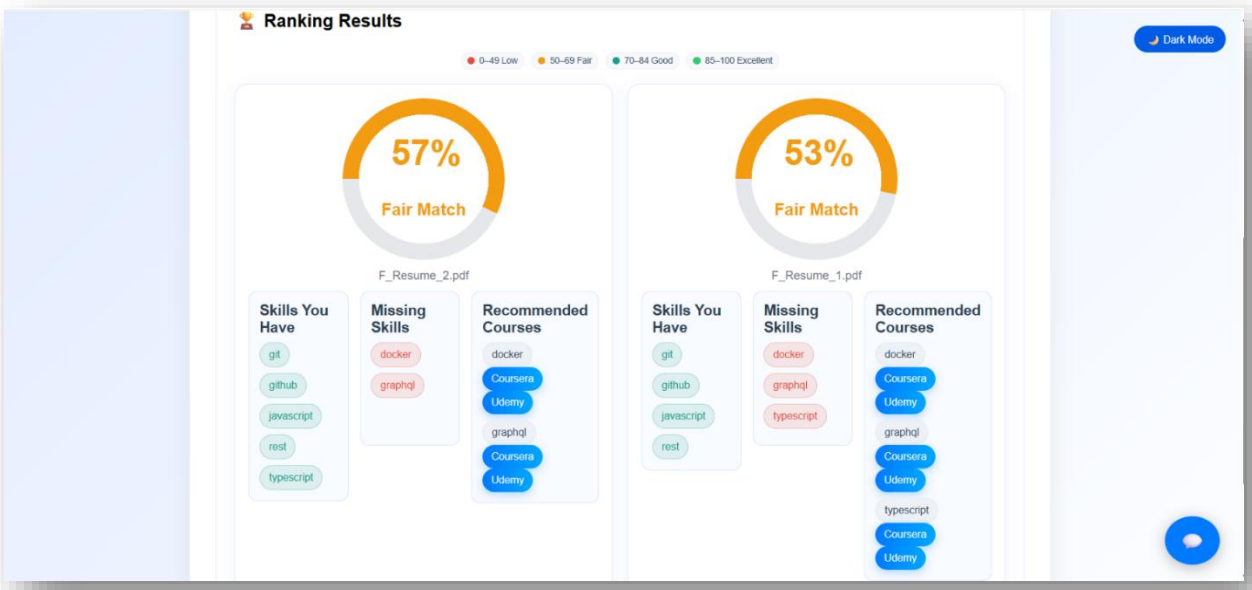


Navigating to the **Portal** page .

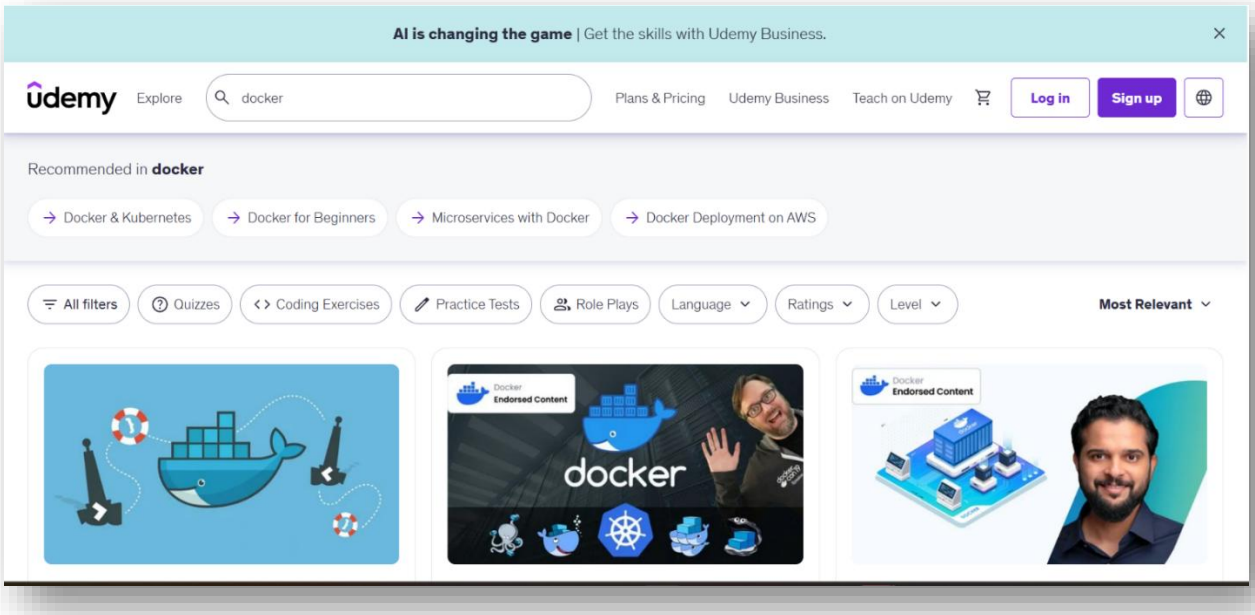




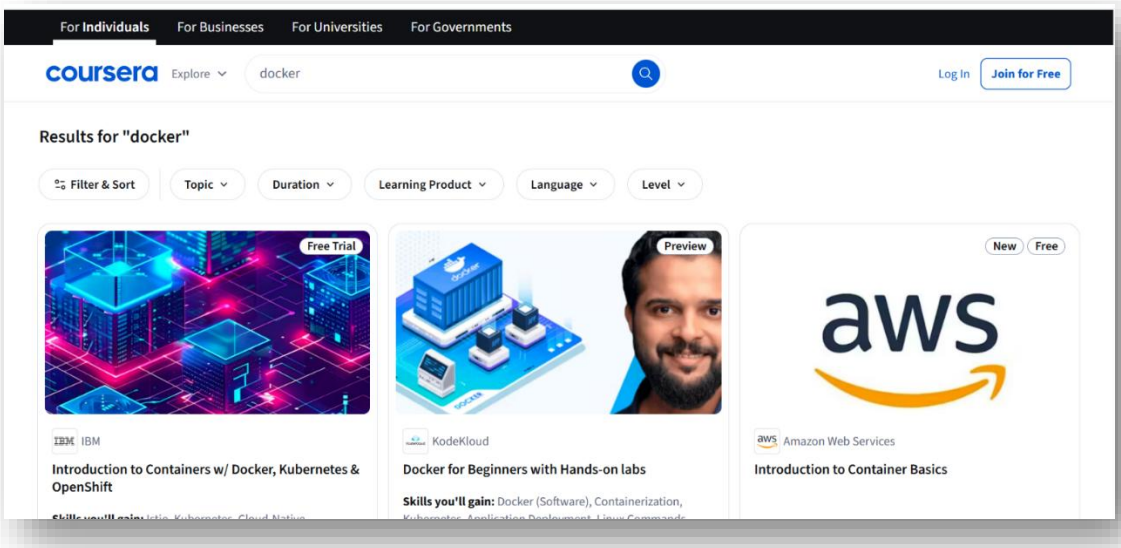
Filling in user details such as Job description portal.



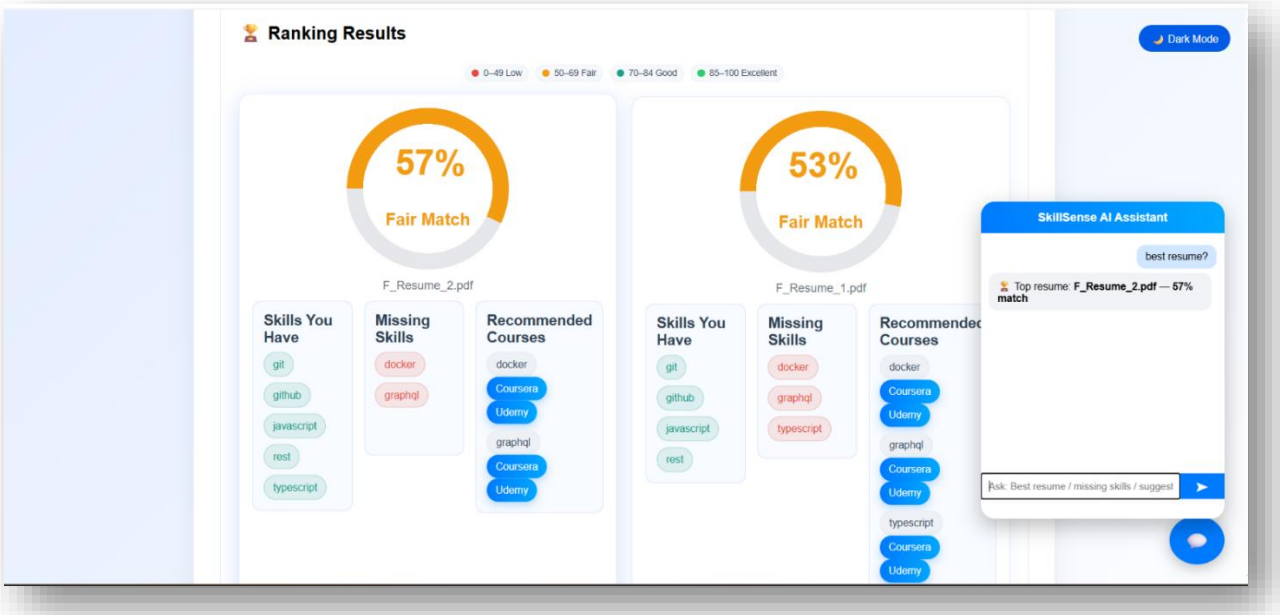
Analyzing the resume : *successfully.*



Course Suggestion page.

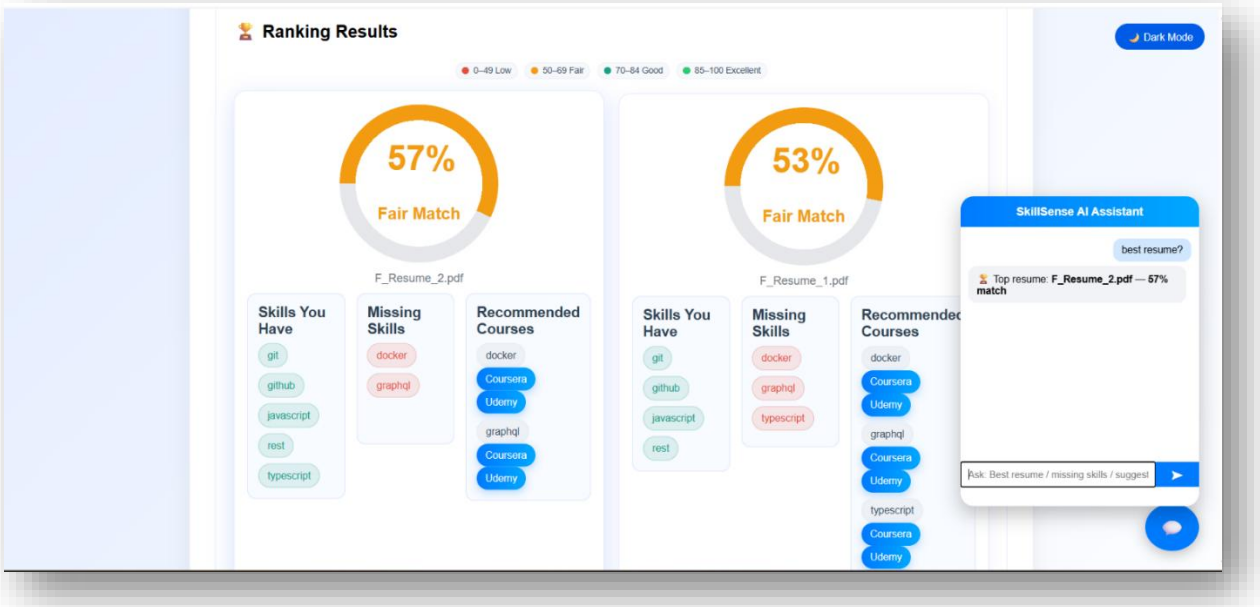


Successful get trending recommended Course , and the dashboard page is loaded.

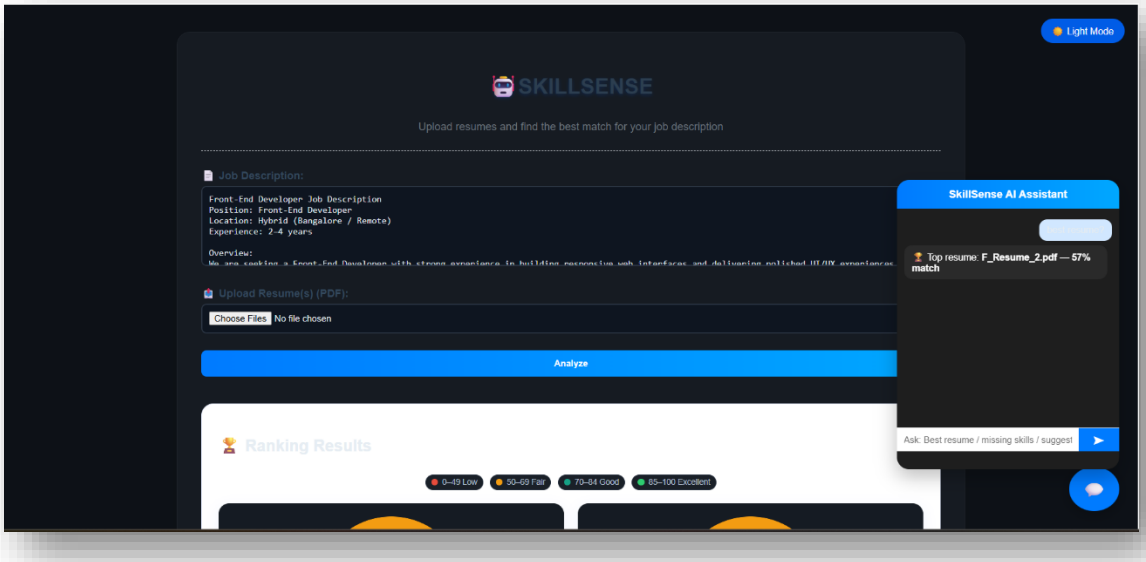


The **Resume Upload Dashboard** is displayed with options to upload a resume and enter a job description.

Clicking the **Bot** button to start the resume–job comparison process.



The **Match Result** page displays the ATS score, matched skills, missing skills, and overall match percentage and suggest top resume .



Viewing the **Original Resume Text** displayed for reference on the same page and Dark Mode and make it attractive to user get clarification.

7. Challenges Faced

During development of the SkillMatch system, several technical and operational challenges were encountered:

1. **PDF Text Extraction Accuracy**
   Different resume formats produced inconsistent text output, requiring fine-tuning of the parser to handle layout issues, missing characters, and multi-column formatting.
2. **Skill Identification Limitations**
   Variations in wording (e.g., "JavaScript developer" vs. "JS expert") caused difficulty in keyword detection, leading to multiple refinements of normalization logic and keyword mapping.
3. **Matching Score Calibration**
   Initial TF-IDF similarity scores did not reflect realistic relevance, requiring multiple iterations to adjust token processing, weighting logic, and threshold interpretation.
4. **UI Responsiveness and Layout Breaks**
   Dynamic result cards, donut charts, and skill grids sometimes misaligned across devices, requiring CSS restructuring and testing for screen adaptability.
5. **Performance Constraints**
   Handling large resume files or multiple uploads simultaneously slowed processing due to PDF parsing overhead, necessitating optimization and caching strategies.
6. **Troubleshooting Library Conflicts**
   Version mismatches in libraries (especially numpy, pandas, sklearn, PyPDF2) caused compatibility issues that required environment recreation and dependency isolation.
7. **User Interaction Enhancements**
   Integrating dark mode toggle and planning chatbot assistance introduced challenges in state persistence, theme retention, and UI integration without altering system logic.
8. **Testing & Validation Challenges**
   Collecting diverse sample resumes and validating output consistency was time-consuming, especially when skill detection varied across formats and domains.

Despite these challenges, iterative debugging, testing, and UI refinement allowed the system to achieve stable performance, accurate matching, and an improved user experience.

8. Learnings & Skills Acquired

The development of the SkillMatch Resume Matcher resulted in significant technical, analytical, and professional learning outcomes:

1. **Practical Understanding of NLP & Text Analytics**
   Gained hands-on experience in preprocessing text, keyword mapping, TF-IDF vectorization, and similarity-based matching.
2. **AI-Driven Decision Systems**
   Understood how machine learning models can support real-world automation such as candidate screening and skill evaluation.
3. **Backend Development & Workflow Integration**
   Learned to design Django-based backend logic for handling file uploads, request routing, data flow, and output rendering.

4. **UI/UX Development & Dashboards**
   Enhanced skills in HTML, CSS, UI structuring, theme toggling, analytics visualization, and responsive layouts.
5. **Debugging & Dependency Management**
   Encountered and solved version conflicts, library errors, and environment configuration challenges—strengthening troubleshooting skills.
6. **System Testing & Iterative Improvement**
   Practiced evaluating output accuracy using sample datasets, identifying mismatch patterns, and fine-tuning algorithms.
7. **Research & Skill Mapping Insight**
   Understood how industry job descriptions translate into competency requirements and how skill gaps inform learning recommendations.
8. **Technical Communication & Documentation**
   Improved ability to document system architecture, progress tracking, reporting, and structured presentation delivery.

Overall, the project strengthened both **AI-technical competencies** and **software engineering mindset**, enhancing capability to build scalable, user-centric solutions.

9. Testimonials from team

- **Team Member 1:**

"This project deepened my understanding of text-based machine learning and exposed me to practical NLP workflows for extracting insights from unstructured resumes."

- **Team Member 2:**

"I gained hands-on exposure to resume parsing and skill recommendation logic, along with developing analytics-driven dashboards that strengthened my applied engineering skills."

- **Team Member 3:**

"SkillMatch improved my ability to collaborate within cross-functional roles, manage milestones effectively, and integrate AI features into a working web application."

- **Team Member 4:**

"The project allowed me to develop stronger analytical thinking through NLP, data preprocessing, visualization techniques, and boosted my confidence in solving real-world AI problems."

- **Team Member 5:**

"This project helped me understand complete pipeline development — from requirement gathering to deployment — enhancing my communication, problem solving and innovation skills."

10. Conclusion

The SkillMatch Resume Matcher successfully demonstrates how AI, NLP, and machine learning can transform hiring and career development processes. The system efficiently analyzes resumes, extracts relevant skills, matches them to job requirements, and provides personalized upskilling recommendations — delivering value to both recruiters and job seekers.

Throughout development, the team strengthened its expertise in end-to-end pipeline design, from data extraction and text processing to UI development and algorithm deployment. The project validated that intelligent screening tools can significantly reduce manual workload, improve decision accuracy, and support candidate growth.

Overall, SkillMatch stands as a practical, scalable, and industry-aligned AI solution with potential for further enhancement, such as chatbot assistance, dark-light UI mode switching, and richer recommendation analytics — showcasing the team's innovation mindset and future readiness.

11. Acknowledgements

We express our sincere gratitude to **Infosys Springboard** for providing us with an excellent learning environment, industry-level curriculum support, and access to resources that helped shape this project effectively.

We extend heartfelt thanks to **Ms. Sangeetha**, our mentor, for her continuous guidance, constructive feedback, and encouragement throughout the development lifecycle. Her insights played a pivotal role in refining our approach, validating our methods, and enhancing our learning experience.

We also appreciate the support from our faculty members, peers, and family for their motivation, collaboration, and valuable suggestions, which helped us stay committed and deliver the SkillMatch project successfully