AI-BASED RESUME ANALYZER USING NLP

PRESENTED BY : RISHABH CHAUHAN

STUDENT NAME: RISHABH CHAUHAN

COLLEGE NAME: GREATER NOIDA INSTITUTE OF TECHNOLOGY(GNIOT)

DEPARTMENT : CSE

EMAIL ID: crishabh384@gmail.com

AICTE STUDENT ID: STU67cf1151a87dc1741623633

PROBLEM STATEMENT

The manual review of resumes by recruiters has become increasingly inefficient due to the overwhelming volume and inconsistency in resume formats. Many applicants fail to structure their resumes properly, often omitting essential information or lacking relevant keywords that match job descriptions. This results in missed opportunities for candidates and additional workload for hiring teams. An AI-based resume analyzer can address this challenge by using Natural Language Processing to intelligently assess resume quality, suggest improvements, and ensure alignment with industry expectations.

PROPOSED SOLUTION

The solution developed is an AI-powered web application that automates the process of resume evaluation using advanced Natural Language Processing (NLP) techniques. Users can upload their resumes in PDF format, which are processed through several modules:

I. Text Extraction: Using PyPDF2, the system reads and extracts raw text content from the PDF file.

II. Keyword Extraction: With spaCy, the application identifies key nouns and proper nouns that represent skills, roles, or tools, helping to understand the core strengths in the resume.

III. Grammar and Spelling Analysis: TextBlob is used to detect and correct grammatical errors and misspellings in the resume content.

IV. Intelligent Suggestions: Based on the content analysis, the system provides targeted suggestions—for example, recommending the inclusion of an Education or Work Experience section if missing.

The front-end interface built using Streamlit makes the tool easily accessible, allowing users to receive real-time feedback on how to improve the quality, clarity, and relevance of their resumes. This solution significantly reduces manual screening time and helps applicants align their resumes with current industry standards.

SYSTEM APPROACH

The system approach for the AI-Based Resume Analyzer is modular and streamlined to ensure efficiency, accuracy, and user accessibility. It follows a step-by-step processing pipeline:

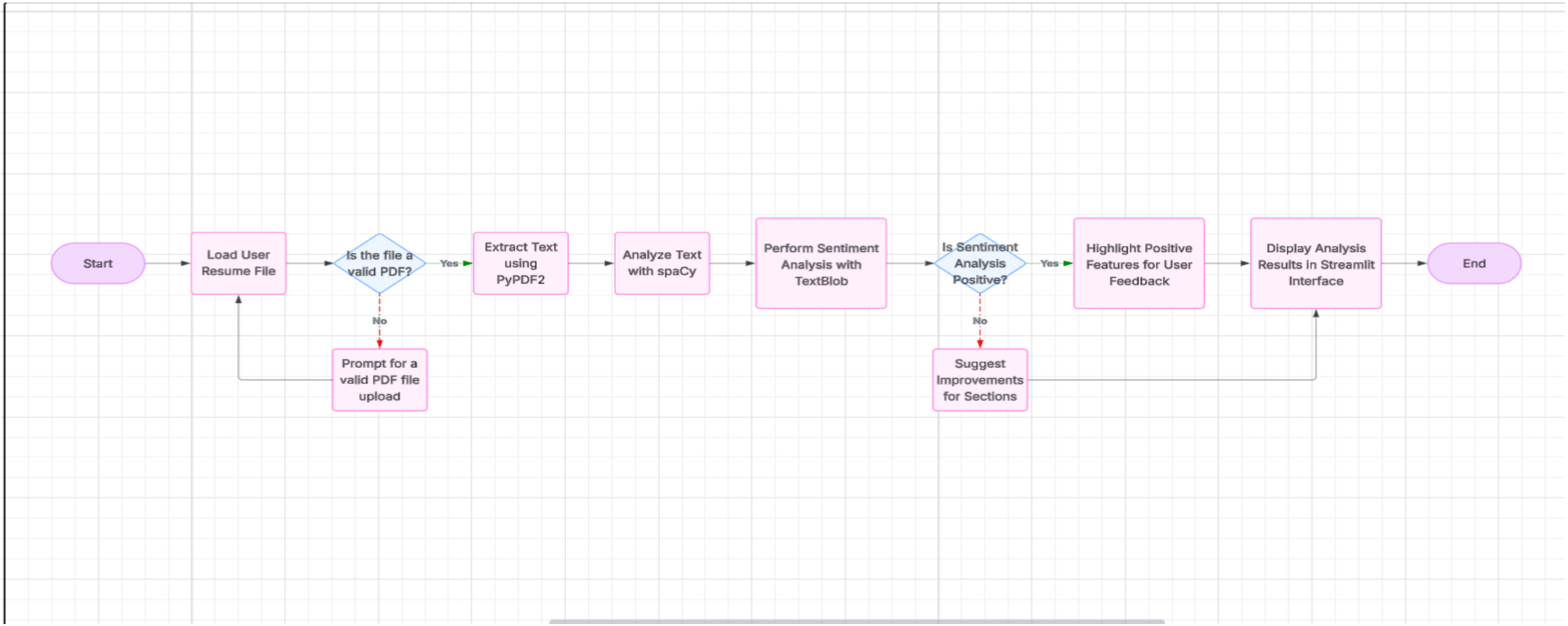
1. Input Layer: The user uploads their resume as a PDF through a web interface built with Streamlit.
2. Text Extraction Module: PyPDF2 is used to read and extract text content from the uploaded document.
3. Natural Language Processing (NLP) Module
    - spaCy analyzes the text to identify key phrases, nouns, and proper nouns as potential skills and job roles.
    - TextBlob checks for grammar and spelling errors, offering corrective suggestions.

SYSTEM APPROACH

4. Analysis & Evaluation Layer:
    - The system evaluates resume quality based on length, keyword richness, and section completeness.
    - It detects the presence or absence of vital sections such as education and experience.

5. Feedback & Output Layer:
    - Displays keywords, grammar feedback, and personalized improvement suggestions.
    - Presents results in real-time on the same Streamlit interface.

FLOW CHART


Start
Load User Resume File
Is the file a valid PDF?
Yes
No
Prompt for a valid PDF file upload
Extract Text using PyPDF2
Analyze Text with spaCy
Perform Sentiment Analysis with TextBlob
Is Sentiment Analysis Positive?
Yes
No
Suggest Improvements for Sections
Highlight Positive Features for User Feedback
Display Analysis Results in Streamlit Interface
End

ALGORITHM & DEPLOYMENT

Algorithm Selection:

- Chosen Algorithm: NLP Techniques for Text Analysis
- Overview: The core algorithm utilizes NLP techniques to analyze resumes. Key modules include:
- spaCy: For keyword extraction (identifying relevant skills, roles, and tools)
- TextBlob: For grammar and spelling correction.
- Justification: NLP allows for accurate, automated text analysis without manual intervention. It helps identify important keywords, correct errors, and evaluate the overall structure of resumes.

Data Input:

- Input: PDF Resume (user uploads the resume in PDF format)
- Text Extraction: Using PyPDF2, the resume text is extracted and processed.
- NLP Processing: The extracted text is then processed using spaCy for keyword extraction and TextBlob for grammar correction.

ALGORITHM & DEPLOYMENT

Training Process:

- No Traditional Training: Since this solution doesn't use machine learning models, the focus is on rule-based processing.
- Keyword Extraction: spaCy processes the resume text to identify important nouns and proper nouns, which represent key skills, job roles, and tools.
- Grammar Correction: TextBlob performs grammar and spelling checks based on predefined rules.

Prediction Process:

- Text Analysis: The resume's content is analyzed based on the presence of key sections (e.g., education, experience), keyword density, and grammar/spelling.
- Suggestions: Based on the analysis, the system generates suggestions (e.g., adding missing sections like Education or improving keyword usage).
- Real-time Output: The results are displayed on a Streamlit web interface, where users can see their resume's strengths and weaknesses.

ALGORITHM & DEPLOYMENT

Deployment:

- Web Application: Built using Streamlit, the tool is deployed as a simple web app that allows users to upload resumes and receive instant feedback.

- Hosted Online: Can be hosted on platforms like Heroku or Streamlit Sharing to make it accessible for a wider audience.

RESULT

Key Results:

- **Accurate Text Extraction:** The system successfully extracts text from resumes, even with varied formatting, using the PyPDF2 library.
- **Keyword Extraction:**
  - Identified critical keywords (skills, job roles, tools) from the resume text using spaCy.
  - Top 10 keywords relevant to job roles are presented to help the applicant highlight core strengths.

- **Grammar & Spelling Feedback:**
  - The TextBlob library automatically detects and corrects grammatical errors and spelling mistakes.
  - It provides real-time suggestions for improvement, enhancing the professionalism of the resume.

RESULT

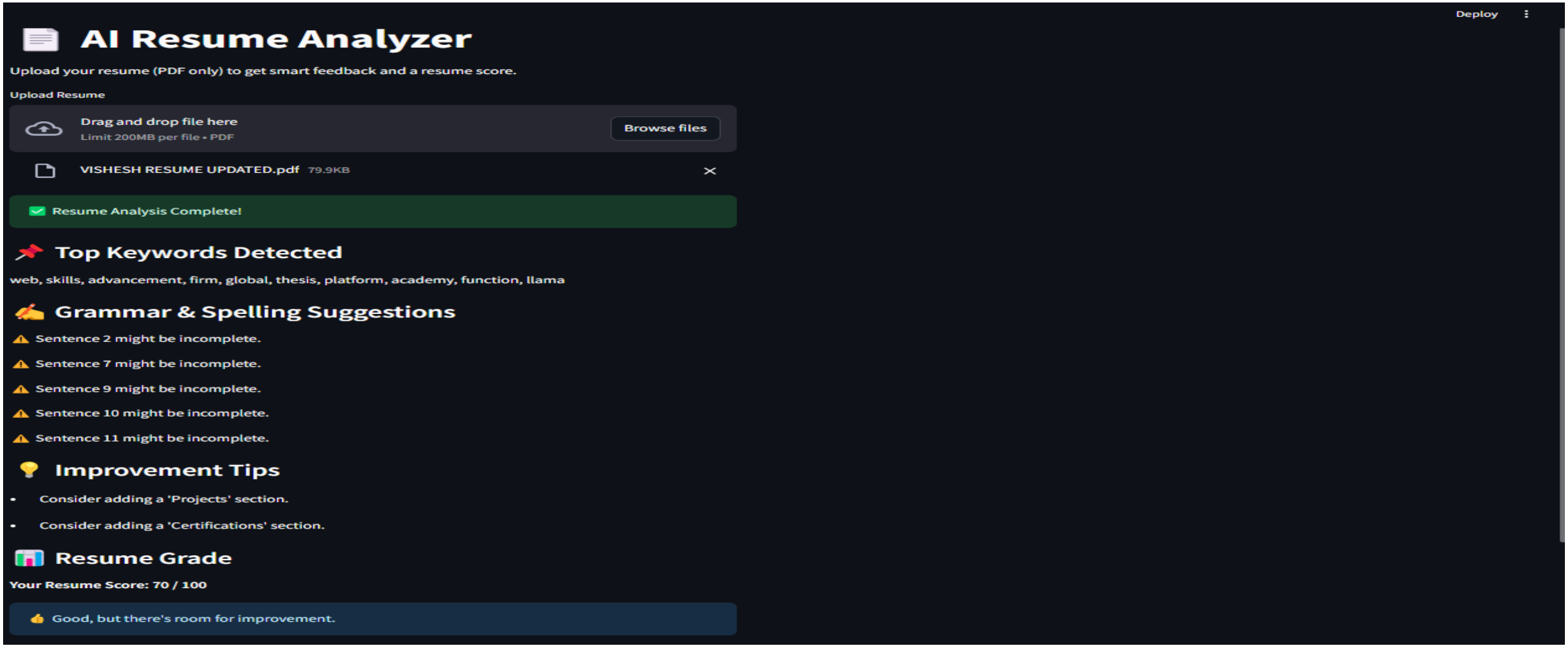
Improvement Suggestions:

- Missing Sections: The system identifies essential sections like Education, Experience, or Skills that may be missing from the resume.
- Weak Keyword Density: If the resume lacks important industry-related keywords, the system flags this, suggesting areas to improve for better visibility in automated recruitment systems.
- Clarity and Structure: Suggestions for better structure, including advice on layout and formatting.

Impact:

- Instant Feedback: Users receive immediate suggestions to improve their resumes, making it easier to align with job requirements.
- Improved Resume Quality: Helps job seekers refine their resumes by focusing on the most important content, correcting errors, and making them more competitive for recruitment processes.

RESULT(OUTPUT):



CONCLUSION

The AI-based resume analyzer automates the resume review process, significantly saving time for recruiters while providing immediate, actionable feedback to job seekers. It not only detects and corrects grammar and spelling errors but also suggests improvements in resume structure and keyword relevance. By ensuring that resumes are aligned with industry standards, the tool enhances the chances of applicants securing interviews and simplifies the recruitment process for hiring teams.

FUTURE SCOPE

The AI-based resume analyzer has significant potential for expansion. Future enhancements could include seamless integration with LinkedIn profiles, enabling automatic resume updates and making the process more efficient. Additionally, introducing a feature that matches resumes to specific job descriptions and assigns a job-fit score could provide more personalized and relevant feedback. To cater to a global audience, adding multilingual support would make the tool accessible to non-English speaking job seekers. Furthermore, incorporating advanced AI techniques could enable deeper insights into candidate skills and industry trends, ensuring a more robust and comprehensive resume analysis.

REFERENCES

- Streamlit: https://streamlit.io
- spaCy: https://spacy.io
- TextBlob: https://textblob.readthedocs.io
- PyPDF2 Documentation: https://pythonhosted.org/PyPDF2

❖**My project Github link**: https://github.com/rishi7838/AI-Resume-Analyzer-for-EDUNET_Internship

Thank you