

Industry Project / IBM Project Report On Artificial Intelligence Based Solutions for Corporate Employees

Developed By: -

Mayan Suthar (21162172005)

Mahendra Dod (2116210202)

Nawaz Bakali (20162121003)

Guided By:-

Prof. Neha Rajput (Internal)

Mr. Nirav Rajgor (External)

**Submitted to
Faculty of Engineering and Technology
Institute of Computer Technology
Ganpat University**



**Institute of
Computer
Technology**



Year - 2024

CERTIFICATE

This is to certify that the **IBM** Project work entitled “**Artificial Intelligence Based Solutions for Corporate Employees**” by Mayan Suthar(Enrolment No.21162172005), Mahendra Dod(Enrolment No.21162102002) and Nawaz Bakali(EnrolmentNo.20162121003) of Ganpat University, towards the partial fulfillment of requirements of the degree of Bachelor of Technology – Computer Science and Engineering, carried out by them in the CSE(CBA/BDA/CS) Department. The results/findings contained in this Project have not been submitted in part or full to any other University / Institute for award of any other Degree/Diploma.

Name & Signature of Internal Guide

Name & Signature of Head

Place: ICT - GUNI

Date:

ACKNOWLEDGEMENT

IBM project is a golden opportunity for learning and self-development. I consider myself very lucky and honored to have so many wonderful people lead me through in completion of this project. First and foremost, I would like to thank Dr. Rohit Patel, Principal, ICT, and Prof. Dharmesh Darji, Head, ICT who gave us an opportunity to undertake this project. My grateful thanks to Prof. Neha Rajput & Prof. Nirav Rajgor for their guidance in project work Artificial Intelligence Based Solutions for Corporate Employees, who despite being extraordinarily busy with academics, took time out to hear, guide and keep us on the correct path. We do not know where would have been without his/her help. CSE department monitored our progress and arranged all facilities to make life easier. We choose this moment to acknowledge their contribution gratefully.

ABSTRACT

The AI Resume Analyzer for corporate employee is an innovative tool designed to streamline corporate employee hiring processes by automating resume screening. In today's competitive job market, HR departments are inundated with a large volume of resumes for every job opening. Benefits include time and cost savings, improved candidate quality, and enhanced diversity and inclusion. Overall, it revolutionizes recruitment, offering a powerful solution for efficient and effective hiring.

INDEX

Title	Page No
CHAPTER1: INTRODUCTION	01-02
CHAPTER 2: PROJECT SCOPE	03-04
CHAPTER 3: SOFTWARE AND HARDWARE REQUIREMENT	05-06
CHAPTER 4: PROJECT PLAN	07-08
4.1 List of Major Activities	08
CHAPTER 5: IMPLEMENTATION DETAILS	09-18
5.1 ER Diagram of Implementation	10
5.2 Project Site Map	11
5.3 Data Dictionary	12
5.4 Project Details	13
5.5 Implementation	16
CHAPTER 6: CONCLUSION AND FUTURE WORK	26-27
CHAPTER 7: REFERENCE	28-29

CHAPTER: 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

The AI project is to streamline the hiring process for corporate employees by leveraging artificial intelligence (AI) and natural language processing (NLP) technologies. This project aims to automate and enhance the resume screening process, enabling recruiters to efficiently identify qualified candidates from a large pool of applicants.

A tool which parses information from a resume using natural language processing and finds the keywords, cluster them onto sectors based on their keywords. And lastly show recommendations, predictions, and analytics to the applicant / recruiter based on keyword matching

Manual process of resume screening and Recruitment is time consuming and less accuracy. It Reduce manual effort and time spent on resume screening. Improve the accuracy and consistency of resume evaluation.

- Programing Language(Python)
- HTML/CSS, Scripting language for front end
- Ai Frameworks(Spacy,PyResparser,pandas)
- Database(MySql)

CHAPTER: 2 PROJECT SCOPE

CHAPTER 2 PROJECT SCOPE

Key Focus Areas:

- **Automated Resume Parsing:** Develop algorithms to extract relevant information from resumes such as education, work experience, skills, and achievements using natural language processing (NLP) techniques.
- **Skill and Experience Matching:** Implement algorithms to match the skills and experience listed in resumes with the requirements of the job roles
- **Semantic Analysis:** Utilize NLP techniques to understand the contextual meaning of phrases and sentences within resumes, allowing for deeper comprehension of candidates' qualifications and potential fit for different positions.
- **Applicant Ranking and Scoring:** Develop algorithms to rank and score candidates based on their compatibility with job roles, enabling recruiters to prioritize candidates efficiently.
- **Bias Mitigation:** Implement measures to mitigate unconscious biases in the resume screening process, promoting fair and equitable candidate evaluation.
- **User-Friendly Interface:** Design an intuitive and user-friendly interface for recruiters and hiring managers to interact with the resume analysis system, allowing for easy navigation, customization, and decision-making.

CHAPTER: 3 SOFTWARE AND HARDWARE REQUIREMENTS

CHAPTER 3 SOFTWARE AND HARDWARE REQUIREMENTS

Minimum Hardware Requirements

Processor	2.0 GHz
RAM	4GB
HDD	40GB

Table 3.1 Minimum Hardware Requirements

Minimum Software Requirements

Operating System	Any operating system which can support an Python interpreter.
Programming language	Python
Other tools & tech	MySQL server, pyresparser.

Table 3.2 Minimum Software Requirements

CHAPTER: 4 PROJECT PLAN

CHAPTER 4 PROJECT PLAN

4.1 List of Major Activities

- 1) Integration: Develop a user-friendly interface for corporate employees to upload resumes and view analysis results.
- 2) Data Collection: Gather a diverse set of resumes representing various job roles and industries.
- 3) Preprocessing: Clean and preprocess the resumes to remove irrelevant information, standardize formatting, and extract key features.
- 4) Feature Extraction: Utilize NLP techniques to extract relevant features such as skills, experience, education, and achievements from the resumes.
- 5) Model Development: Train machine learning models, such as classification algorithms or neural networks, to classify resumes based on job fit.
- 6) Deployment: Deploy the Resume Analyzer as a website

CHAPTER: 5 IMPLEMENTATION DETAILS

CHAPTER 5 IMPLEMENTATION DETAIL

5.1 Er Diagram of Implementation

G21 IBM Project ER Diagram

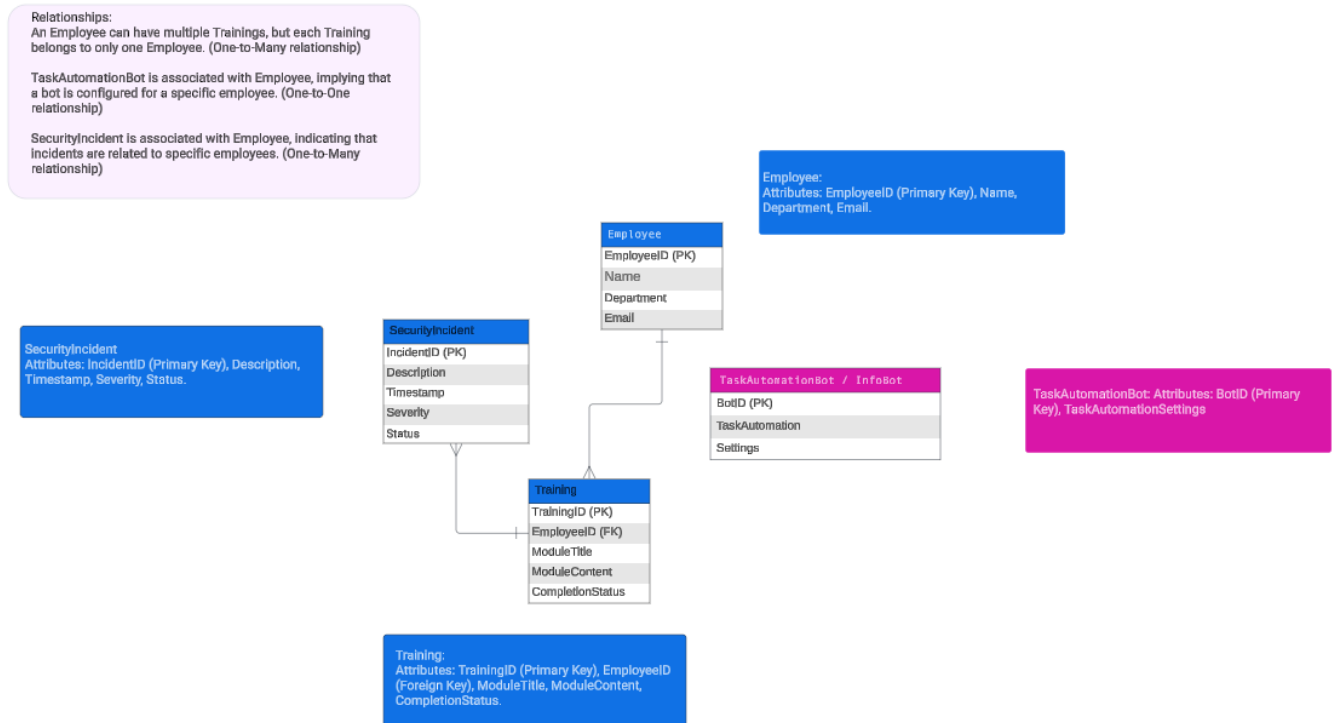


Figure 5.1 Project Implementation ER Diagram

5.2 Project Site Map

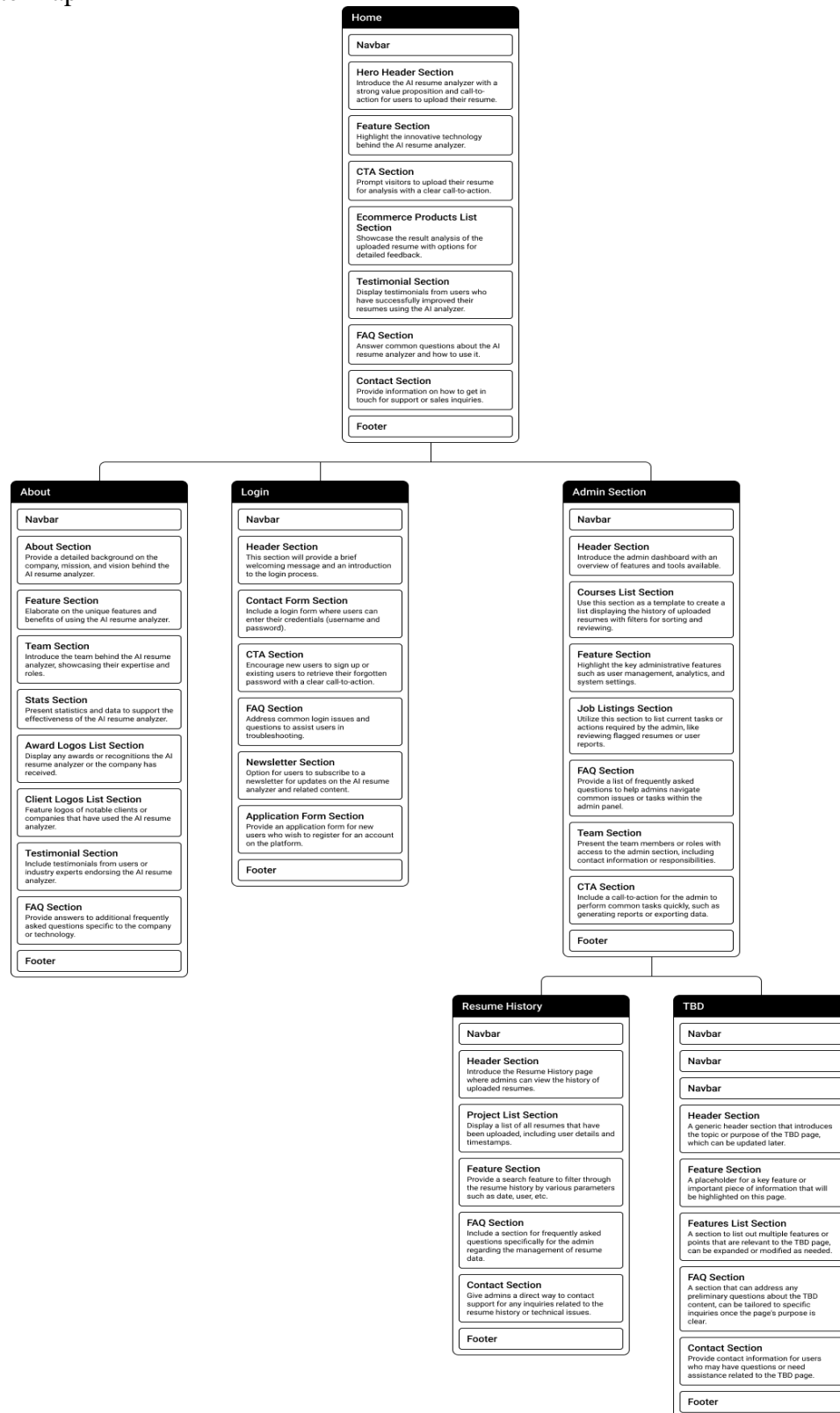


Figure 5.2 Project Sitemap

5.3 Data Dictionary

Quary Used
<pre>CREATE DATABASE g21_ibm_project; USE g21_ibm_project; CREATE TABLE Employee (EmployeeID INT NOT NULL AUTO_INCREMENT PRIMARY KEY, Name VARCHAR(50) NOT NULL, Department VARCHAR(50) NOT NULL, Email VARCHAR(100) NOT NULL UNIQUE); CREATE TABLE SecurityIncident (IncidentID INT NOT NULL AUTO_INCREMENT PRIMARY KEY, Description VARCHAR(255) NOT NULL, Timestamp DATETIME NOT NULL, Severity VARCHAR(20) NOT NULL, Status VARCHAR(20) NOT NULL, EmployeeID INT NOT NULL, FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID)); CREATE TABLE Training (TrainingID INT NOT NULL AUTO_INCREMENT PRIMARY KEY, EmployeeID INT NOT NULL, ModuleTitle VARCHAR(100) NOT NULL, ModuleContent TEXT NOT NULL, CompletionStatus VARCHAR(20) NOT NULL, FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID)); CREATE TABLE TaskAutomationBot (BotID INT NOT NULL AUTO_INCREMENT PRIMARY KEY, TaskAutomationSettings TEXT NOT NULL, EmployeeID INT NOT NULL, FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID));</pre>

Figure 5.3 Sample SQL code for creating database tables

5.4 Project Details

A Natural Language Processing tool is utilized to extract information from resumes, identifying keywords and clustering them into sectors based on their relevance. The tool then provides recommendations, predictions, and analytics to both applicants and recruiters by matching keywords.

Tech Stack:

Frontend

- Streamlit
- HTML
- CSS
- JavaScript

Backend

- Streamlit
- Python
- Database
- MySQL

Modules

- pandas
- pyresparser
- pdfminer3
- Plotly
- NLTK

Library and Tools Used in Project:

Pandas: pandas is a Python package that provides fast, flexible, and expressive data structures designed to make working with "relational" or "labeled" data both easy and intuitive. It aims to be the fundamental high-level building block for doing practical, real world data analysis in Python.

pip install pandas

Streamlit-aggrid: used aggrid library to visualize Data in Data Tables.

pip install streamlit-aggrid

Streamlit: Streamlit lets you transform Python scripts into interactive web apps in minutes, instead of weeks. Build dashboards, generate reports, or create chat apps. Once you've created an app, you can use our Community Cloud platform to deploy, manage, and share your app

pip install streamlit

Pyresparser: Pyresparser is a simple resume parser used for extracting information from resumes

pip install pyresparser

Plotly: Plotly is Open Source Graphing Library for Python

pip install plotly

NLTK: The Natural Language Toolkit (NLTK) is a Python package for natural language processing(NLP).

pip install nltk

Cryptography: Python Cryptography Library For Encryption Of chat. The cryptography library in Python offers robust support for symmetric encryption algorithms such as AES

pip install cryptography

Each Module Info:

Client: -

- Fetching Location and Miscellaneous Data Using Parsing Techniques to fetch
- Basic Info
- Skills
- Keywords

Admin: -

- Get all applicant's data into tabular format
- Download user's data into csv file
- View all saved uploaded pdf in Uploaded Resume folder
- Get user feedback and ratings

Pie Charts for: -

- Ratings
- Predicted field / roles
- Experience level
- Resume score
- User count
- City
- State
- Country

Feedback: -

- Form filling
- Rating from 1 – 5
- Show overall ratings pie chart
- Past user comments history

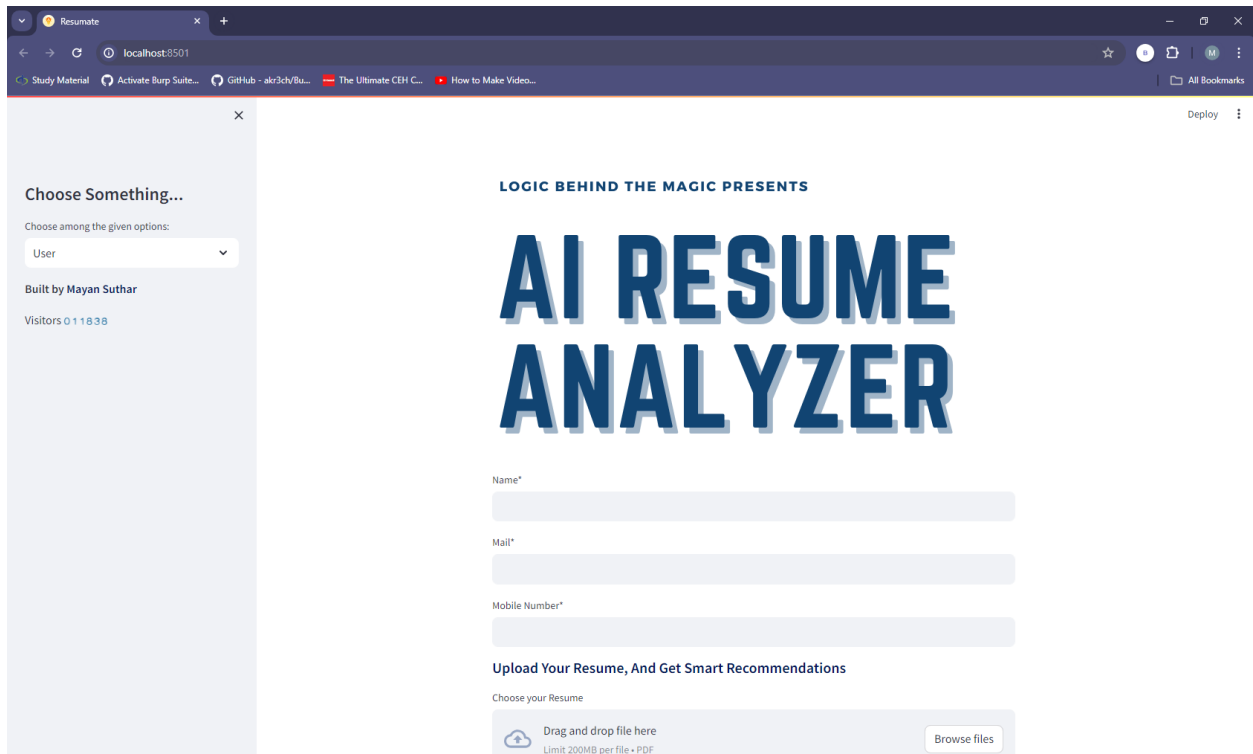
Requirements:

Have these things installed to make your process smooth

- Python <https://www.python.org/downloads/>
- MySQL <https://www.mysql.com/downloads/>
- Visual Studio Code (Preferred Code Editor) <https://code.visualstudio.com/Download>
- Visual Studio build tools for C++ https://aka.ms/vs/17/release/vs_BuildTools.exe

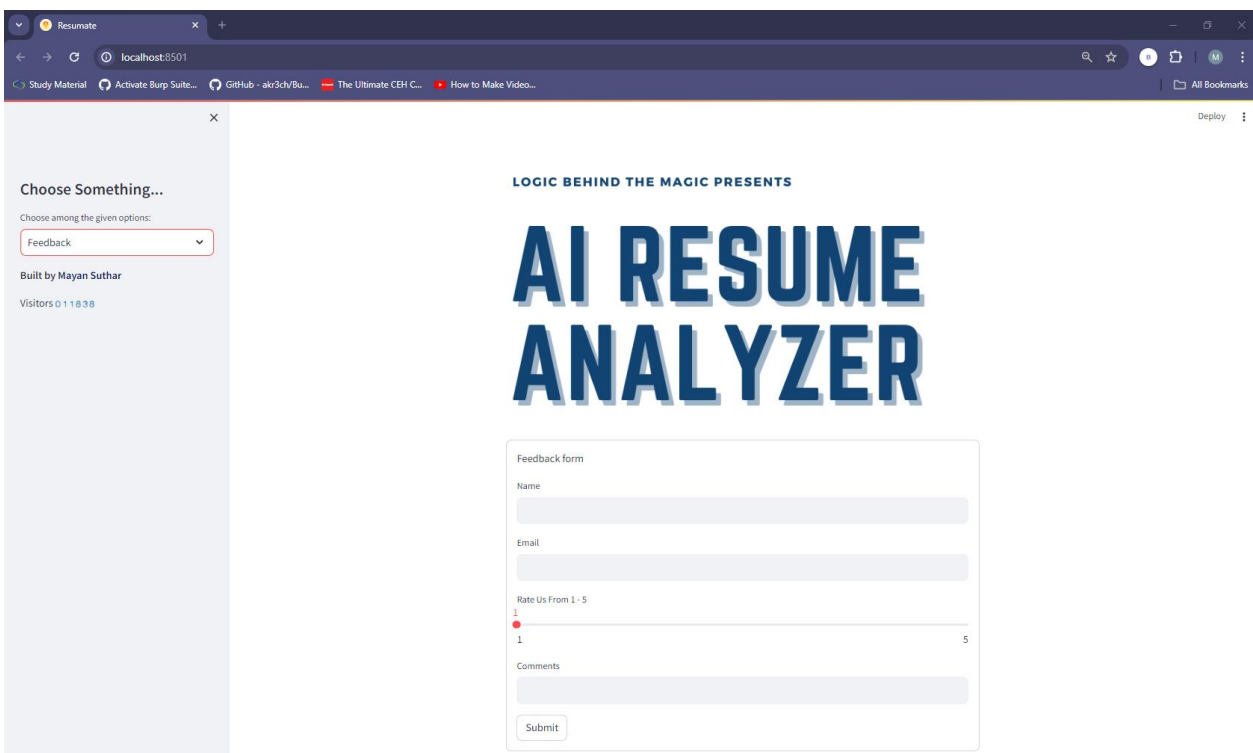
5.5 Implementation

Implement Website on Python Streamlit.



The screenshot shows the home page of the 'AI RESUME ANALYZER' application. The browser address bar shows 'localhost:8501'. On the left, a sidebar contains a 'Choose Something...' dropdown menu with 'User' selected, and text indicating it was 'Built by Mayan Suthar' with 'Visitors 011838'. The main content area features the title 'LOGIC BEHIND THE MAGIC PRESENTS' above the large heading 'AI RESUME ANALYZER'. Below the heading are three input fields for 'Name*', 'Mail*', and 'Mobile Number*'. Further down is a section titled 'Upload Your Resume, And Get Smart Recommendations' with a 'Choose your Resume' label. This section includes a file upload area with a cloud icon and text 'Drag and drop file here' and 'Limit 200MB per file • PDF', along with a 'Browse files' button.

Figure 5.5.1 Home Page.



The screenshot shows the feedback page of the 'AI RESUME ANALYZER' application. The browser address bar shows 'localhost:8501'. The sidebar is identical to the home page, but the 'Choose Something...' dropdown menu now has 'Feedback' selected. The main content area features the title 'LOGIC BEHIND THE MAGIC PRESENTS' above the large heading 'AI RESUME ANALYZER'. Below the heading is a 'Feedback form' containing three input fields for 'Name', 'Email', and 'Rate Us From 1 - 5'. The 'Rate Us From 1 - 5' field is a horizontal slider with a red dot at the '1' position and a '5' at the end. Below the slider is a 'Comments' input field and a 'Submit' button.

Figure 5.5.2 Feedback Page.

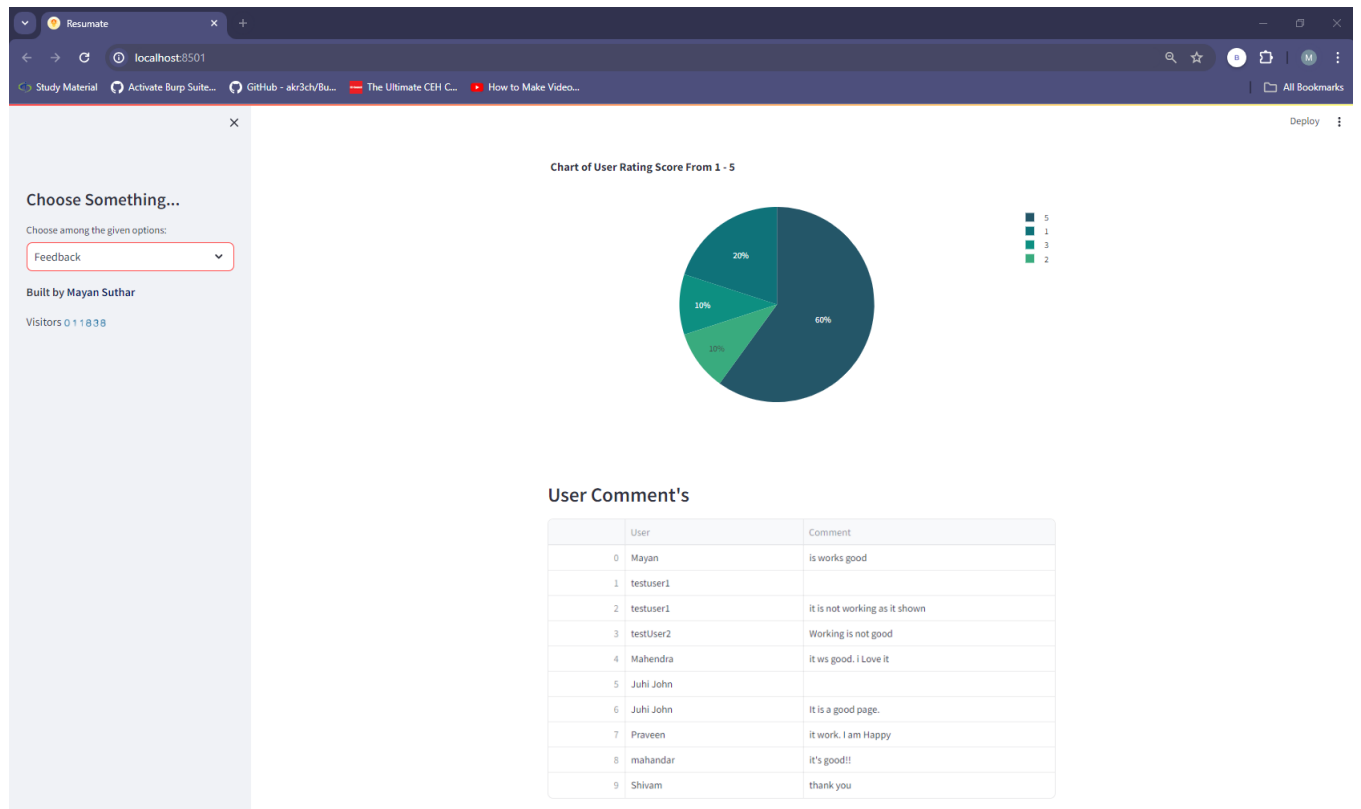


Figure 5.5.3 Feedback Page - Pie Chart Summarizes of Other Users' Comments.

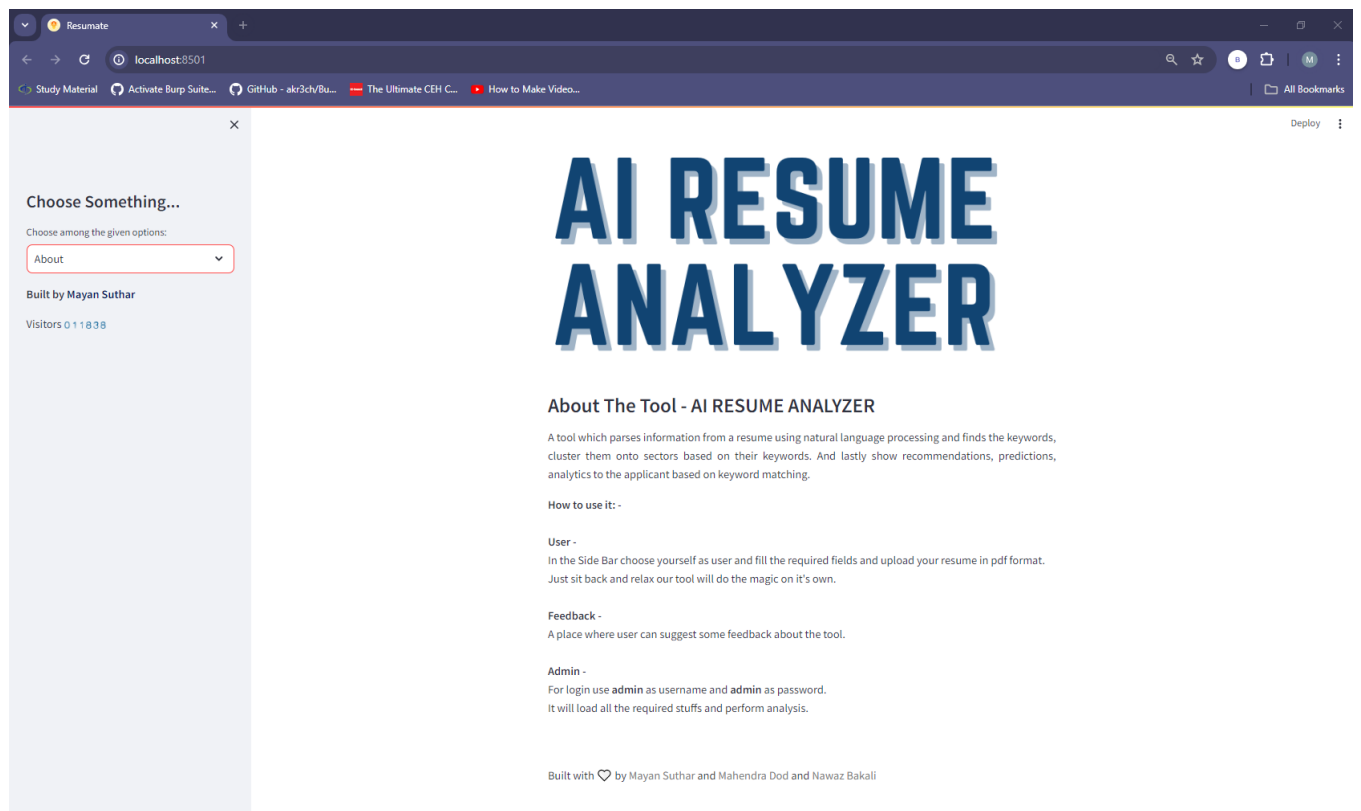


Figure 5.5.4 About Us Page.

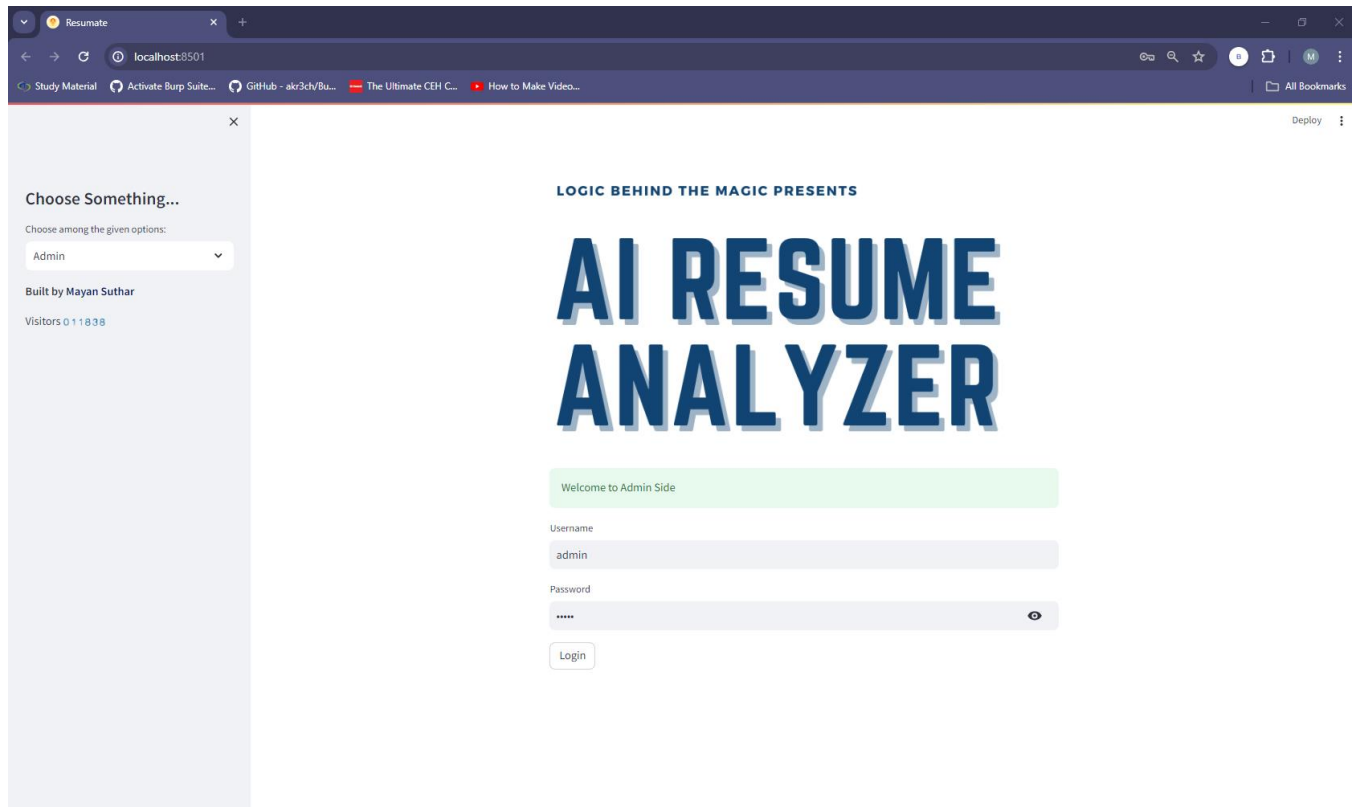


Figure 5.5.5 Admin Login.

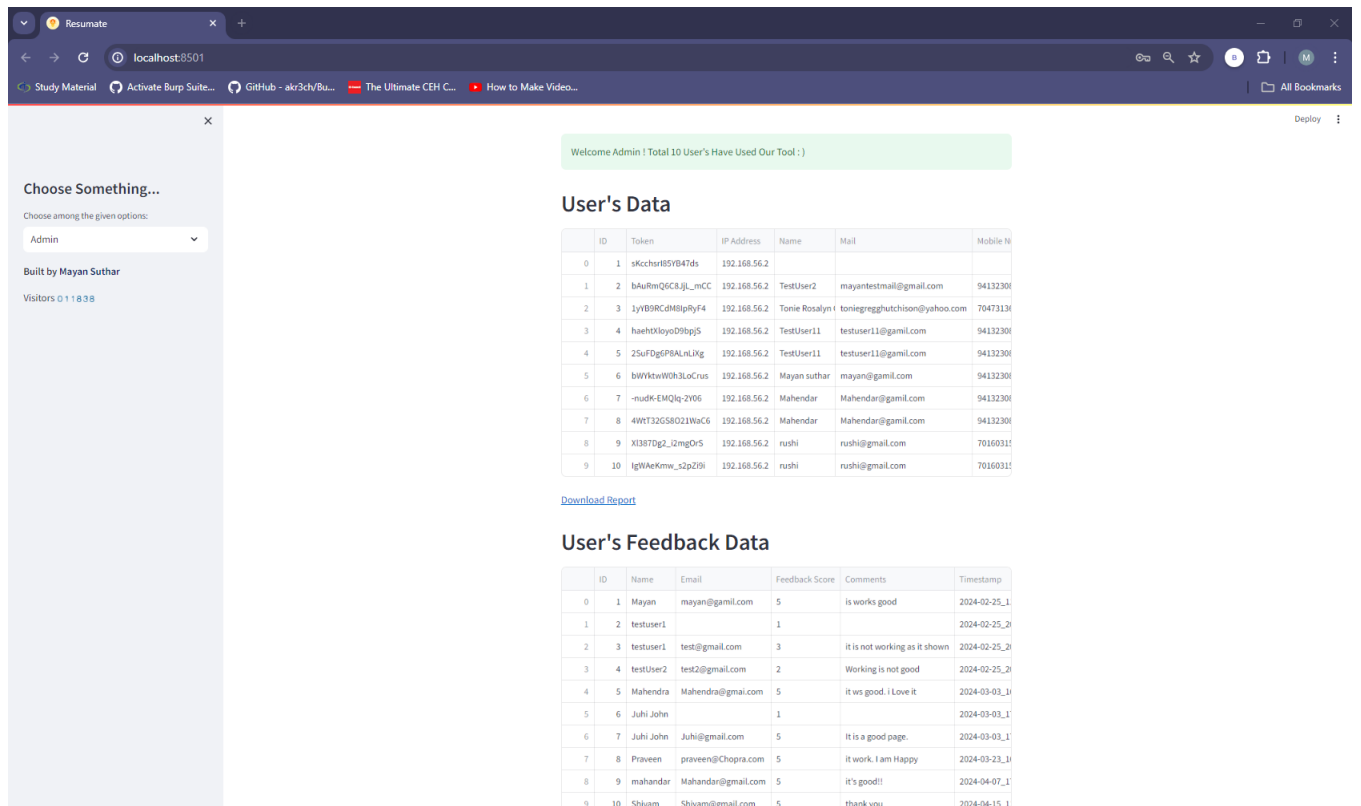


Figure 5.5.6 Admin Page - User Resume Data and Feedback Data. It also has the Download Report option on the page.

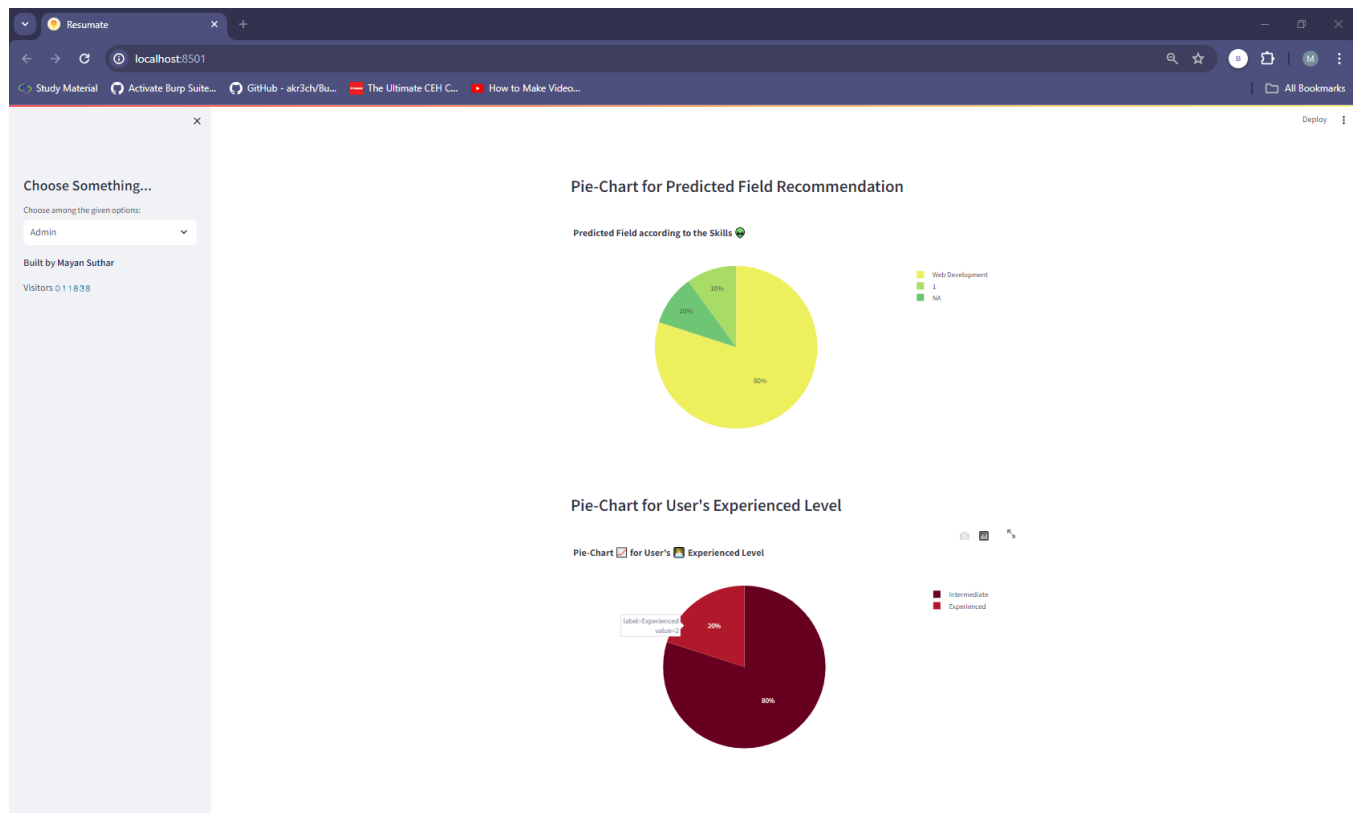


Figure 5.5.7 Admin Page - Pie-Chart for User's Experienced Level and for Predicted Field Recommendation.

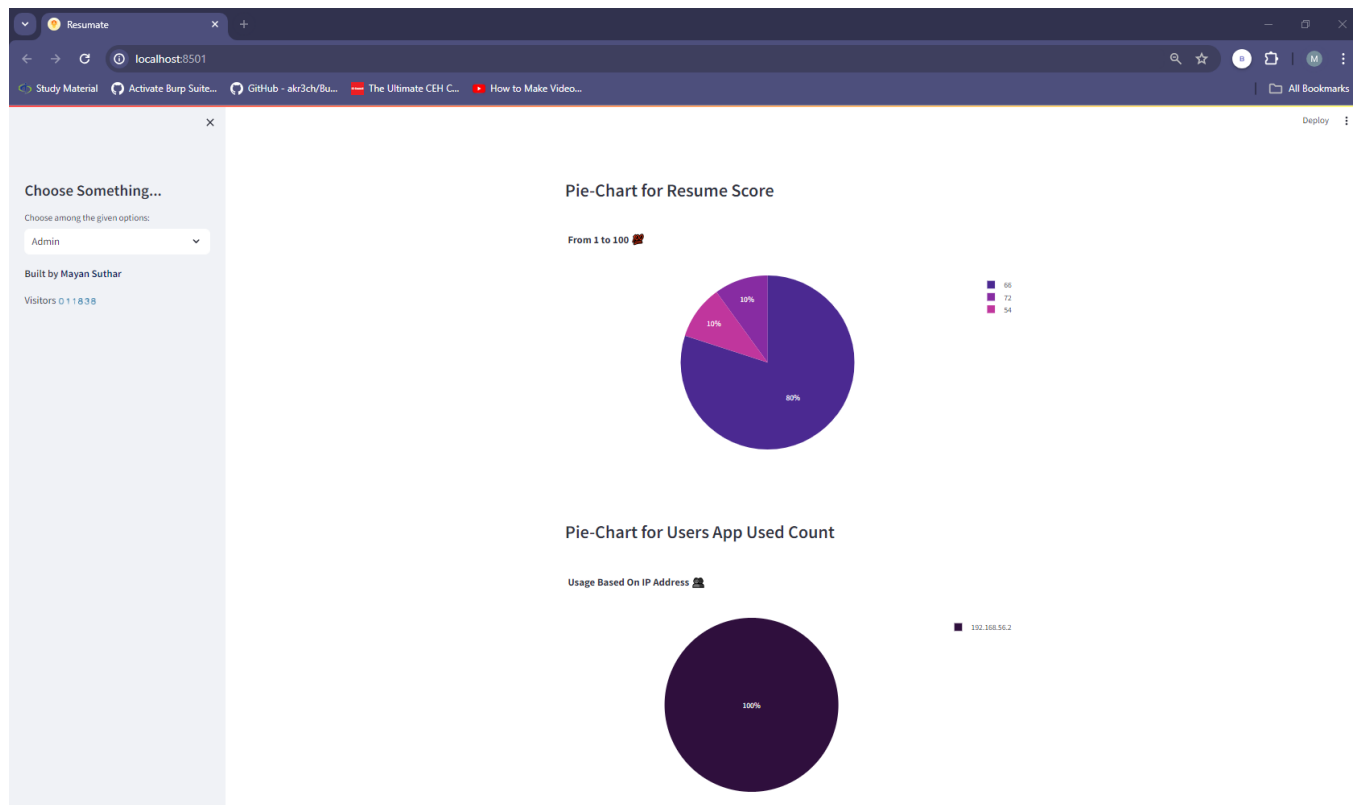
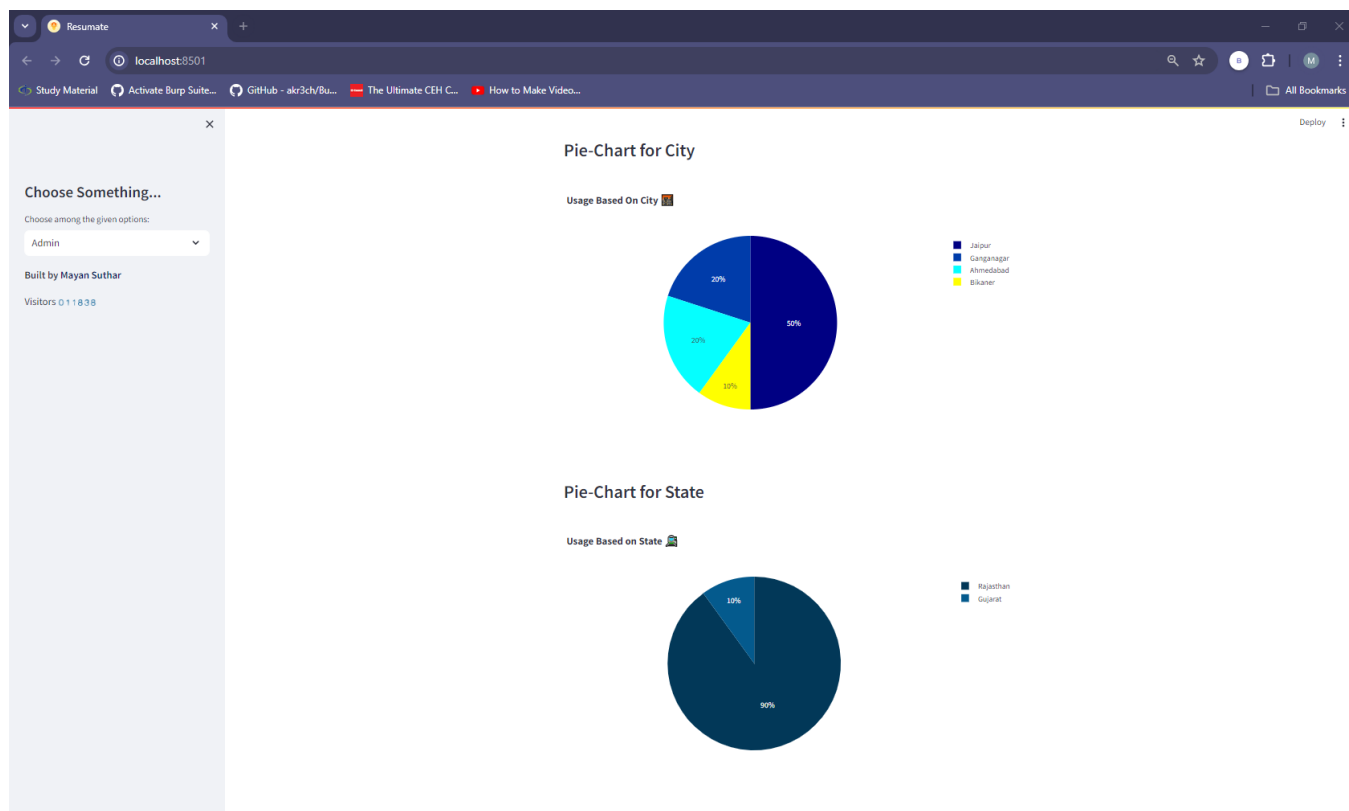


Figure 5.5.8 Admin Page - Pie-Chart for Users App Used Count and for Users App Used Count.



The screenshot displays a web browser window with the address bar showing 'localhost:8501'. The application interface includes a sidebar on the left with a 'Choose Something...' dropdown menu currently set to 'User', and a visitor count of '011833'. The main content area features a large heading 'ANALYZER' and a form with the following fields:

- Name***: Mahendra
- Mail***: Mahendra@gmail.com
- Mobile Number***: 8200729066

Below the form is a section titled 'Upload Your Resume, And Get Smart Recommendations'. It contains a file upload area with the text 'Drag and drop file here' and 'Limit 200MB per file • PDF'. A 'Browse files' button is visible. A file named 'Analyzer Test Resume .pdf' (37.3KB) is shown as uploaded. At the bottom, a preview of the resume is displayed, showing the name 'Mahendra Doshi' and contact information.

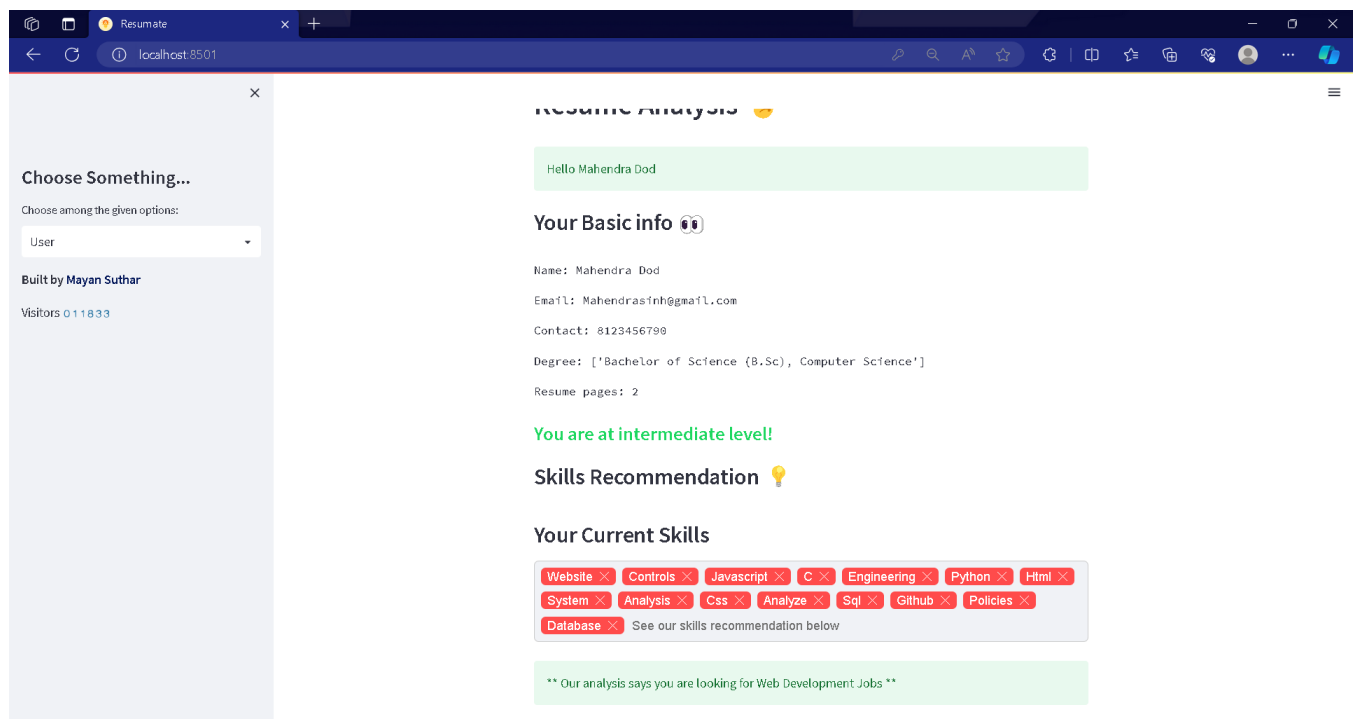


Figure 5.5.10 Parser Resume Result.

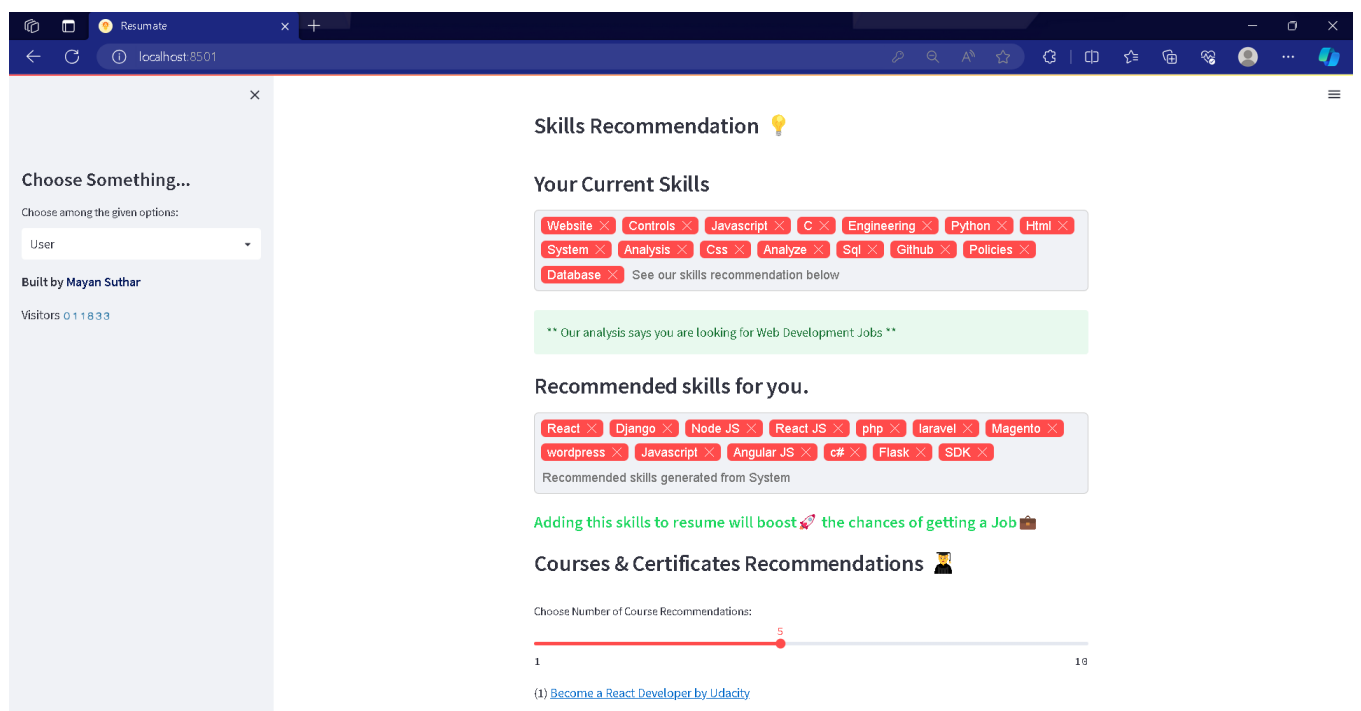


Figure 5.5.11 Parser Resume Result.

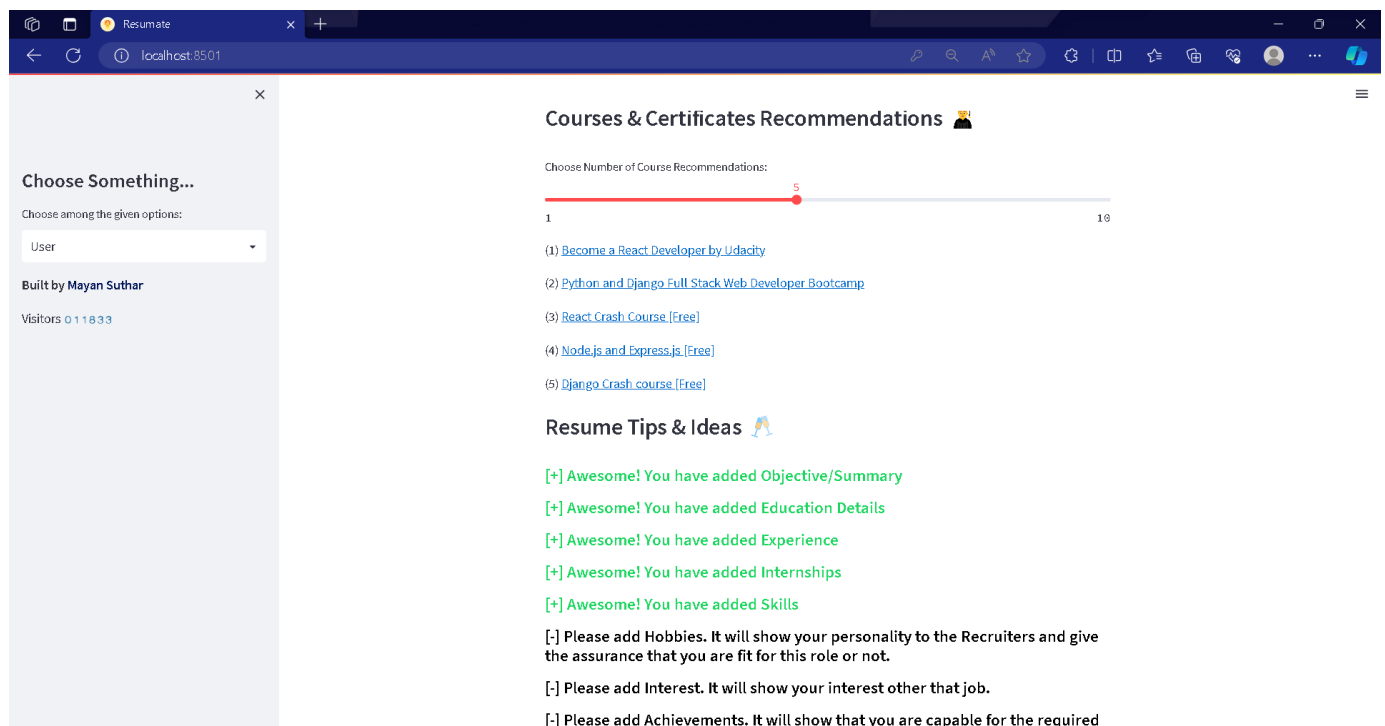


Figure 5.5.12 Parser Resume Result.

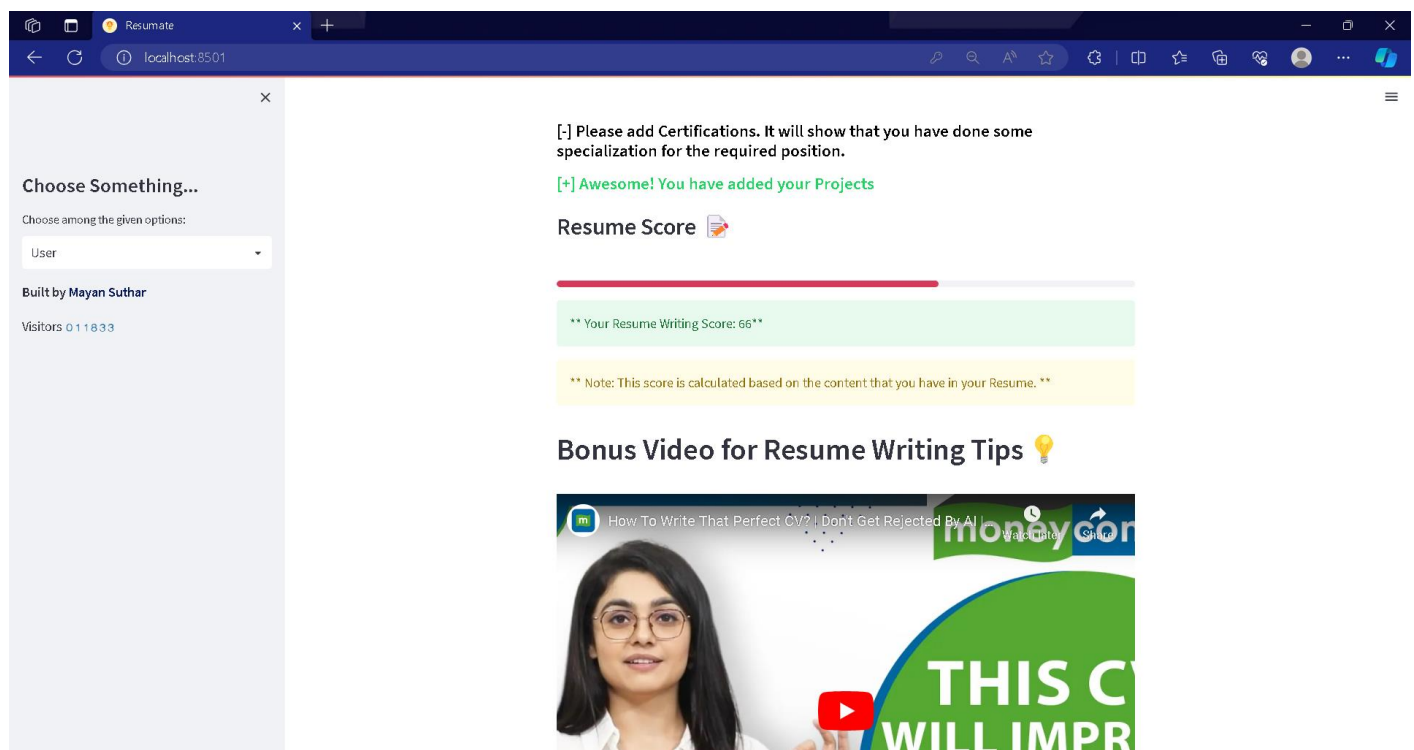


Figure 5.5.13 Parser Resume Score.

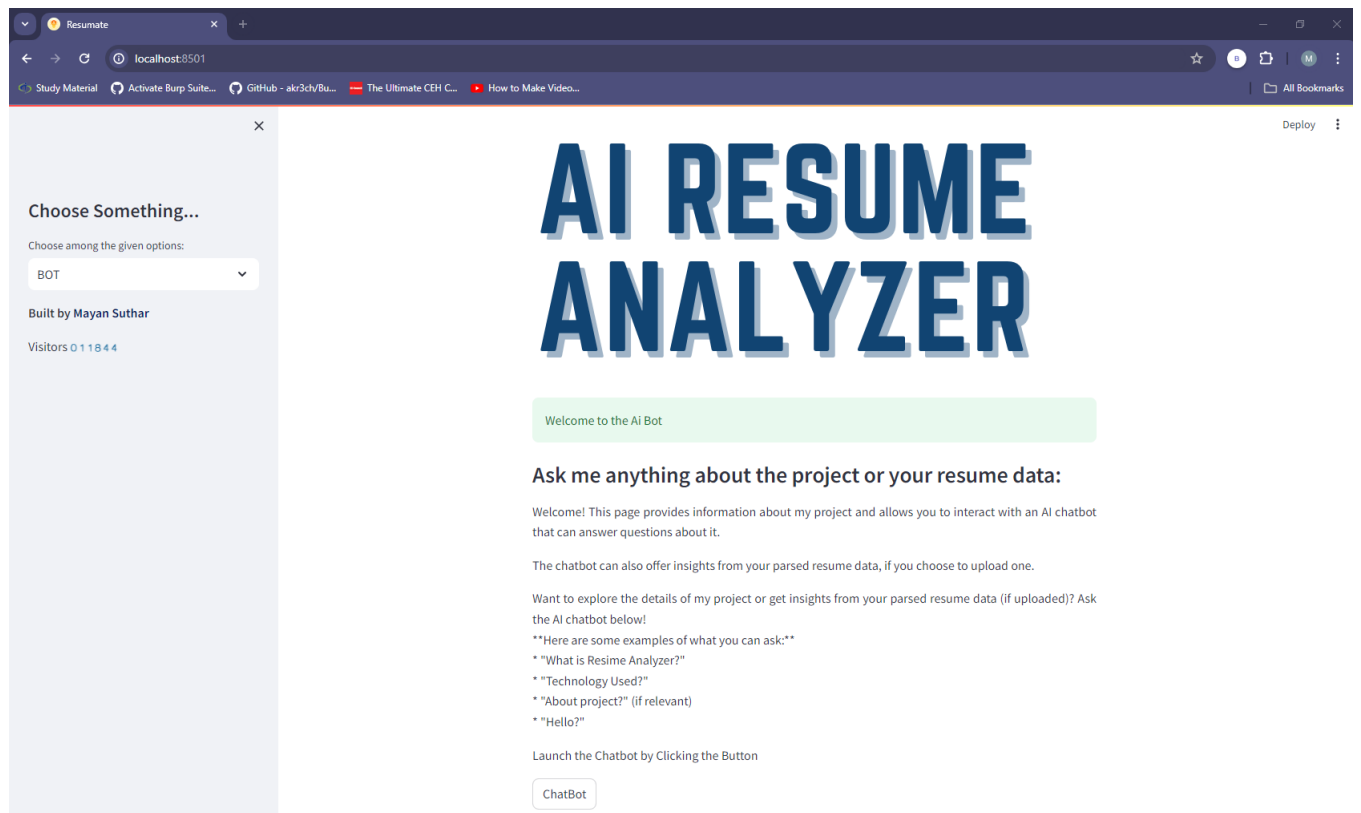


Figure 5.5.14 Chatbot Page.

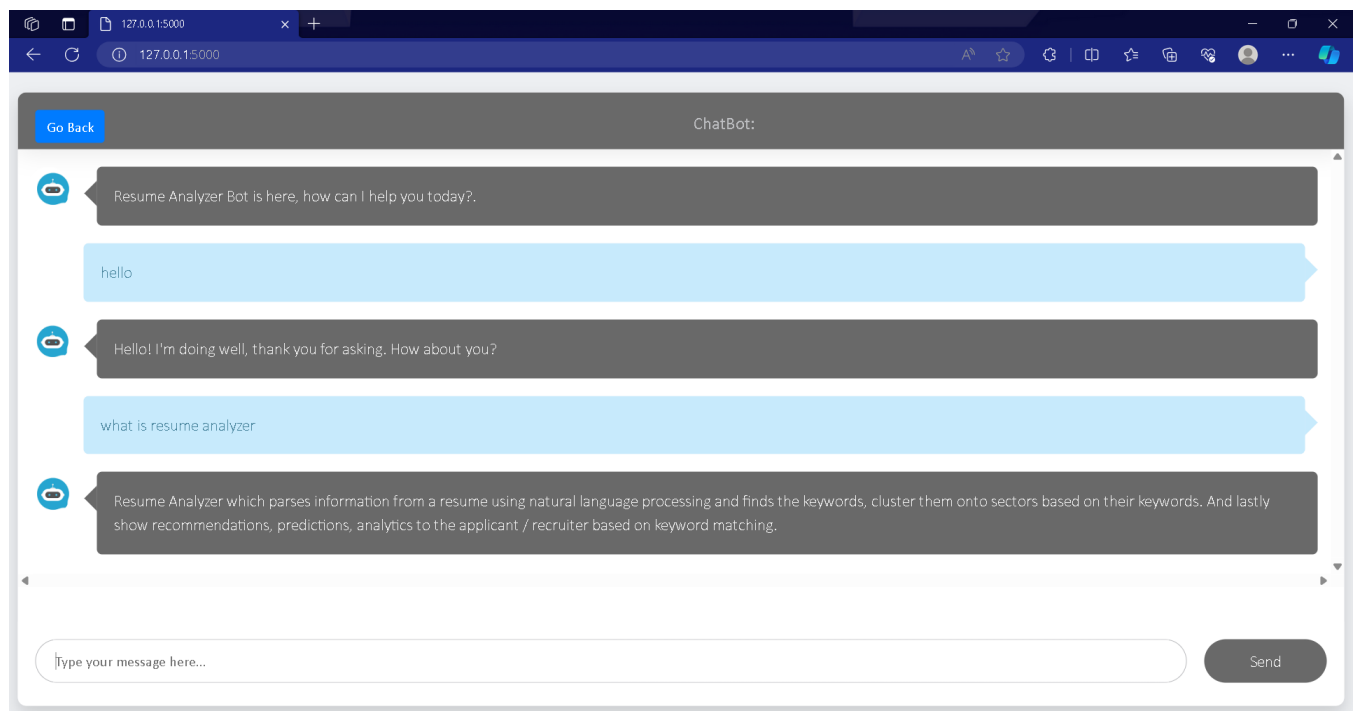


Figure 5.5.15 Chabot Page.

```

132 def run():
133     st.subheader("**Resume Tips & Ideas 📌**")
134     resume_score = 0
135
136     ## Predicting Whether these key points are added to the resume
137     if 'Objective' or 'Summary' in resume_text:
138         resume_score = resume_score + 6
139         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Objective/Summary</h5>'", unsafe_allow_html=True)
140     else:
141         st.markdown("**<h5 style='text-align: left; color: #000000;'>[-] Please add your career objective, it will give your career intension to the Recruiters.</h5>'", unsafe_allow_html=True)
142
143     if 'Education' or 'School' or 'College' in resume_text:
144         resume_score = resume_score + 12
145         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Education Details</h5>'", unsafe_allow_html=True)
146     else:
147         st.markdown("**<h5 style='text-align: left; color: #000000;'>[-] Please add Education. It will give Your Qualification level to the recruiters.</h5>'", unsafe_allow_html=True)
148
149     if 'EXPERIENCE' in resume_text:
150         resume_score = resume_score + 16
151         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Experience</h5>'", unsafe_allow_html=True)
152     elif 'Experience' in resume_text:
153         resume_score = resume_score + 16
154         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Experience</h5>'", unsafe_allow_html=True)
155     else:
156         st.markdown("**<h5 style='text-align: left; color: #000000;'>[-] Please add Experience. It will help you to stand out from crowd</h5>'", unsafe_allow_html=True)
157
158     if 'INTERNSHIPS' in resume_text:
159         resume_score = resume_score + 6
160         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Internships</h5>'", unsafe_allow_html=True)
161     elif 'INTERNSHIP' in resume_text:
162         resume_score = resume_score + 6
163         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Internships</h5>'", unsafe_allow_html=True)
164     elif 'Internships' in resume_text:
165         resume_score = resume_score + 6
166         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Internships</h5>'", unsafe_allow_html=True)
167     elif 'Internship' in resume_text:
168         resume_score = resume_score + 6
169         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Internships</h5>'", unsafe_allow_html=True)
170     else:
171         st.markdown("**<h5 style='text-align: left; color: #000000;'>[-] Please add Internships. It will help you to stand out from crowd</h5>'", unsafe_allow_html=True)
172
173     if 'SKILLS' in resume_text:
174         resume_score = resume_score + 7
175         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Skills</h5>'", unsafe_allow_html=True)
176     elif 'SKILL' in resume_text:
177         resume_score = resume_score + 7
178         st.markdown("**<h5 style='text-align: left; color: #1ed76b;'>[+] Awesome! You have added Skills</h5>'", unsafe_allow_html=True)
179

```

Figure 5.5.16 Code Snippet.

Table	Action	Rows	Type	Collation	Size	Overhead
user_data	Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	16.0 KiB	-
user_feedback	Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	16.0 KiB	-
2 tables	Sum	20	InnoDB	utf8mb4_general_ci	32.0 KiB	0 B

Figure 5.5.17 Database.

ID	feed_name	feed_email	feed_score	comments	Timestamp
1	Mayan	mayan@gamil.com	5	is works good	2024-02-25_11:53:38
2	testuser1	2 testuser1	1		2024-02-25_20:16:41
3	testuser1	test@gmail.com	3	it is not working as it shown	2024-02-25_20:17:04
4	testUser2	test2@gmail.com	2	Working is not good	2024-02-25_20:17:45
5	Mahendra	Mahendra@gmail.com	5	it ws good. i Love it	2024-03-03_16:46:11
6	Juhi John	6 Juhi John	1		2024-03-03_17:40:46
7	Juhi John	Juhi@gmail.com	5	It is a good page.	2024-03-03_17:41:20
8	Praveen	praveen@Chopra.com	5	it work. I am Happy	2024-03-23_16:28:20
9	mahandar	Mahandar@gmail.com	5	it's good!!	2024-04-07_17:10:13
10	Shivam	Shivam@gmail.com	5	thank you	2024-04-15_11:45:23

Figure 5.5.18 DataBase – user_data table (ID, feed_name, feed_email, feed_score, comments).

Showing rows 0 - 9 (10 total. Query took 0.0002 seconds)

SELECT * FROM `user_data`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

ID	sec_token	ip_add	host_name	dev_user	os_name_ver	latlong	city	state	country	act_name	act_mail	act_mob	Name	Email_ID
1	sKccharI85YB47ds	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[26.9196, 75.7878]	Jaipur	Rajasthan	India				Deepak Padhi	dnoobnerd@gmail.com
2	bAuRmQ6C8JlL_mCC	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[26.9196, 75.7878]	Jaipur	Rajasthan	India	TestUser2	mayantestmail@gmail.com	9413230848	Mayan	~mayan230848@gmail.com
3	1yY8RCdM8lpRyF4	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[26.9196, 75.7878]	Jaipur	Rajasthan	India	Tonie Rosalyn Gregg Hutchison	toniegregghutchison@yahoo.com	7047313626	Tonie Rosalyn	toniegregghutchison@yahoo.com
4	haehXloyoD9bpJS	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[29.5201, 73.875]	Ganganagar	Rajasthan	India	TestUser11	testuser11@gamil.com	9413230848	Deepak Padhi	dnoobnerd@gmail.com
5	2SufDg6P8ALnLIXg	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[29.5201, 73.875]	Ganganagar	Rajasthan	India	TestUser11	testuser11@gamil.com	9413230848	Deepak Padhi	dnoobnerd@gmail.com
6	bWYktwW0h3LoCrus	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[23.6258, 72.5873]	Ahmedabad	Gujarat	India	Mayan suthar	mayan@gamil.com	9413230848	Deepak Padhi	dnoobnerd@gmail.com
7	-nudK-EMQlq-ZY06	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[26.9196, 75.7878]	Jaipur	Rajasthan	India	Mahendar	Mahendar@gamil.com	9413230848	Deepak Padhi	dnoobnerd@gmail.com
8	4Wt32GS8Q21WaC6	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[26.9196, 75.7878]	Jaipur	Rajasthan	India	Mahendar	Mahendar@gamil.com	9413230848	Deepak Padhi	dnoobnerd@gmail.com
9	XI387Dg2_L2mgOrS	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[28.0176, 73.3149]	Bikaner	Rajasthan	India	rushi	rushi@gmail.com	7016031546	Deepak Padhi	dnoobnerd@gmail.com
10	lgWAekmw_s2pZ9i	192.168.56.2	DESKTOP-3M8P22N	Asus	Windows 10	[28.0176, 73.3149]	Bikaner	Rajasthan	India	rushi	rushi@gmail.com	7016031546	Deepak Padhi	dnoobnerd@gmail.com

Check all | With selected | Edit | Copy | Delete | Export

Console w all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Figure 5.5.18 DataBase – user_feedback table (ID,sec_token,ip_add, host_name, dev_user, os_name_ver, latlong, city, state ,country, act_name, act_mail, act_mob, Name, Email_ID, resume_score, Timestamp, Page_no, Predicted_Field, User_level, Actual_skills, Recommended_skills, Recommended_courses, pdf_name).

CHAPTER: 6 CONCLUSION AND FUTURE WORK

CHAPTER 6 CONCLUSION

Conclusion

The AI resume checker helps corporate workers by making it easier to go through resumes when hiring. It saves time, cuts down on unfair treatment, and picks better candidates. With AI, companies can hire people more efficiently and choose the right person for the job with more confidence. Till now we have made algorithm in python for resume parsing. And prepare ChatBot

CHAPTER: 7 REFERENCES

CHAPTER 7 REFERENCES

- 1) <https://www.geeksforgeeks.org/project-how-to-build-a-resume-parser-using-python/>
- 2) <https://pypi.org/project/pyresparser/>
- 3) <https://spacy.io/usage/spacy-101>
- 4) <https://pypi.org/project/cryptography/>
- 5) [NLTK :: Natural Language Toolkit](#)
- 6) Site Map: <https://www.figma.com/file/xQFjFq7g2f2Yg1IO6Pkt8y/IBM---AI-Resume-Analyzer?type=design&node-id=0-1&mode=design&t=IpOPSLQAz7FOdBjG-0>
- 7) ER-Diagram: https://lucid.app/lucidchart/773b9ec9-7324-45eb-a1d6-070067ec19d4/edit?invitationId=inv_9ba6c9d4-8fe7-4aed-94fc-fbccfafc4ab3&page=0_0#