AI-RESUME ANALYZER

Submitted in partial fulfillment of the requirements of the degree of

BACHELOR OF COMPUTER ENGINEERING

by

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Guide:

Prof. Ramya.R.B

Department of Computer Engineering

A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE

(2024-2025)

A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE

CERTIFICATE

This is to certify that the Mini Project 2B entitled "**AI-RESUME ANALYZER**" is a bonafide work of **"Aniket Asawale(22102140), Aditya Jayaraman (22102117), Palak Boricha (22102193), Priya Bugade (22102186)"** submitted to the University of Mumbai in partial fulfillment of the require- ment for the award of the degree of **Bachelor of Engineering** in **Computer Engineering.**

Guide	Project Coordinator	Head of Department
Prof. Ramya .R.B	Prof. R. R. Nikam	Dr S.H. Malave

A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE

Project Report Approval for Mini Project-2B

This project report entitled "**AI-resume analyzer"** by Priya Bugade**,** Aditya Jayaraman**,** Aniket Asawale**,** Palak Boricha is approved for the partial fulfillment of the degree of ***Bachelor of Engineering*** in ***Computer Engineering***, ***2024-25***

Examiner Name Signature

1. _____

2. _____

Date:

Place:

Declaration

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabri - cated or falsified any idea/data/fact/source in my submission. weunderstand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Date:

Abstract

The aim of this project is to design and develop a tool that results into an easy and helpful solutions for applicants. “AI-RESUME ANAYLZER” which parses information from resume using natural language processing, find the keywords, cluster them into sectors based on their keywords and lastly show recommendations, predictions, analytics to the applicant based on keyword matching. The AI-RESUME project introduces an innovative solution aimed at transforming the traditional resume-building and evaluation process through the use of artificial intelligence. In today’s competitive job market, candidates often struggle to create resumes that meet both human and automated screening standards. This project addresses these challenges by developing an AI-powered platform capable of analyzing resumes in real time, offering insightful feedback on formatting, structure, keyword usage, grammar, and overall relevance to specific job roles. Using Natural Language Processing (NLP) and machine learning algorithms, the system intelligently assesses each section of a resume - such as summary, skills, experience, and education - and provides personalized recommendations to enhance its quality and impact. The platform is user-friendly and accessible, designed to assist not only job seekers but also career coaches, HR professionals, and educational institutions. By simulating the behavior of modern hiring systems, AI-RESUME empowers users to tailor their resumes to industry standards, improving visibility and increasing the chances of landing interviews. This project represents a significant step forward in the automation of career development tools and sets the stage for future enhancements

Keywords: Artifical Intellingence, Resume Evaluation**,** Job Application, Ai- Resume scoring.

CONTENTS

LIST OF FIGURES

Chapter 1

Introduction

In today's competitive job market, a well-crafted resume is often the first step toward securing employment opportunities. However, many applicants struggle to create resumes that effectively communicate their skills, experience, and potential to recruiters and automated systems alike. The AI-RESUME project addresses this challenge by introducing an intelligent, AI-powered solution designed to analyze, evaluate, and enhance resumes in a systematic and user-friendly manner. Leveraging the capabilities of Natural Language Processing (NLP) and machine learning, the platform interprets the structure and con- tent of resumes to provide constructive feedback and personalized suggestions. Unlike traditional resume builders, AI-RESUME goes beyond formatting support and spelling checks by assessing keyword optimization, section relevance, content clarity, and alignment with specific job roles. Its ability to simulate the evaluation process of Applicant Tracking Systems (ATS) ensures that users can tailor their resumes for better visibility and ranking during recruitment screenings. This project serves not only as a tool for individual job seekers but also holds potential value for HR professionals and educational institutions aiming to prepare students for professional success. By integrating artificial intelligence into the resume-building process, AI-RESUME bridges the gap between applicants and recruiters, making resume creation more strategic, effective, and future-ready.

Chapter 2

Literature Survey

E. Galanki, “The decision to recruit online: a descriptive study,” Career Development International, vol. 7, pp. 243-251, 2002.
This study outlines traditional recruitment methods such as job fairs, print media ads, employee referrals, and campus recruitment. It highlights the limitations of these manual approaches, including time consumption and limited reach. The AI Resume Analyzer aims to modernize this process by digitizing resume evaluation and matching, offering a faster and more scalable solution for both job seekers and recruiters.

Pooja T. Killewale & Prof. A.R. Mune, “A Review on Job Portal - A Web Application for Distributed Clients.”
This paper reviews how job search methods have evolved from offline approaches like referrals and agency visits to online portals. It emphasizes the convenience and efficiency of digital job search tools. The AI Resume Analyzer aligns with this shift by offering intelligent resume insights and personalized recommendations, streamlining the job-seeking experience.

McDonald, P., & Thompson, P. (2013). “Social media and the reshaping of public/private boundaries in employment relations,” International Journal of Management Reviews.
This paper discusses how social media platforms use personalized ads based on user profiles. Similarly, the AI Resume Analyzer uses extracted resume data and job role profiles to provide targeted feedback and role-specific suggestions, enhancing relevance and increasing hiring potential through data-driven personalization.

Research Paper	ANALYSIS
1. Pooja T. Killewale, Prof. A.R. Mune – A Review on Job Portal - A Web Application for Distributed Clients	This paper explains the working of a basic online job portal from both job seekers' and recruiters' perspectives. It helped in understanding how an AI-powered system like ours can enhance the seeker side by improving resume quality before submission.
2. E. Galanki – The Decision to Recruit Online: A Descriptive Study, 2002	This paper explains the need for online recruitment platforms for better efficiency and convenience. It supports the idea of our project, which focuses on automating the resume screening and improving process through intelligent analysis.
3. McDonald, P., & Thompson, P. – Social Media and the Reshaping of Public/Private Boundaries in Employment Relations, 2013	The influence of social media and the internet as a whole is explained in this paper. The paper highlights how the internet and social media have influenced recruitment. Our project builds on this by using AI to help users prepare better resumes for digital platforms and recruiter screening tools.
4. Goyal, S. – Advertising on Social Media, 2018	This paper explains the use of social media in the recruitment process. The applications like LinkedIn are widely used.
5. Syagga, P. M. Report of the interregional workshop on employment generation in urban works programs through efficient use of local resources	The working of local job agencies in the recruitment and job-finding system in the older days.

Chapter 3

Problem Statement, Objective & Scope

Problem Statement: -

To create an intelligent, AI-powered resume analysis system that assists job seekers in improving the quality, structure, and effectiveness of their resumes. In today's highly competitive job market, applicants often struggle to meet the expectations. As a result, many qualified candidates are overlooked due to poorly structured or non-optimized resumes. By doing so, the system will enable users to tailor their resumes more effectively to job descriptions, thereby increasing their chances of being shortlisted for interviews and improving overall employability.

Objective: -

- To develop an AI-based system capable of analyzing resumes for content quality, formatting, and relevance.
- To design a user-friendly interface that allows seamless resume uploads and interpretation of evaluation results.
- To support career growth by helping users build more compelling and professionally structured resumes.

Scope: -

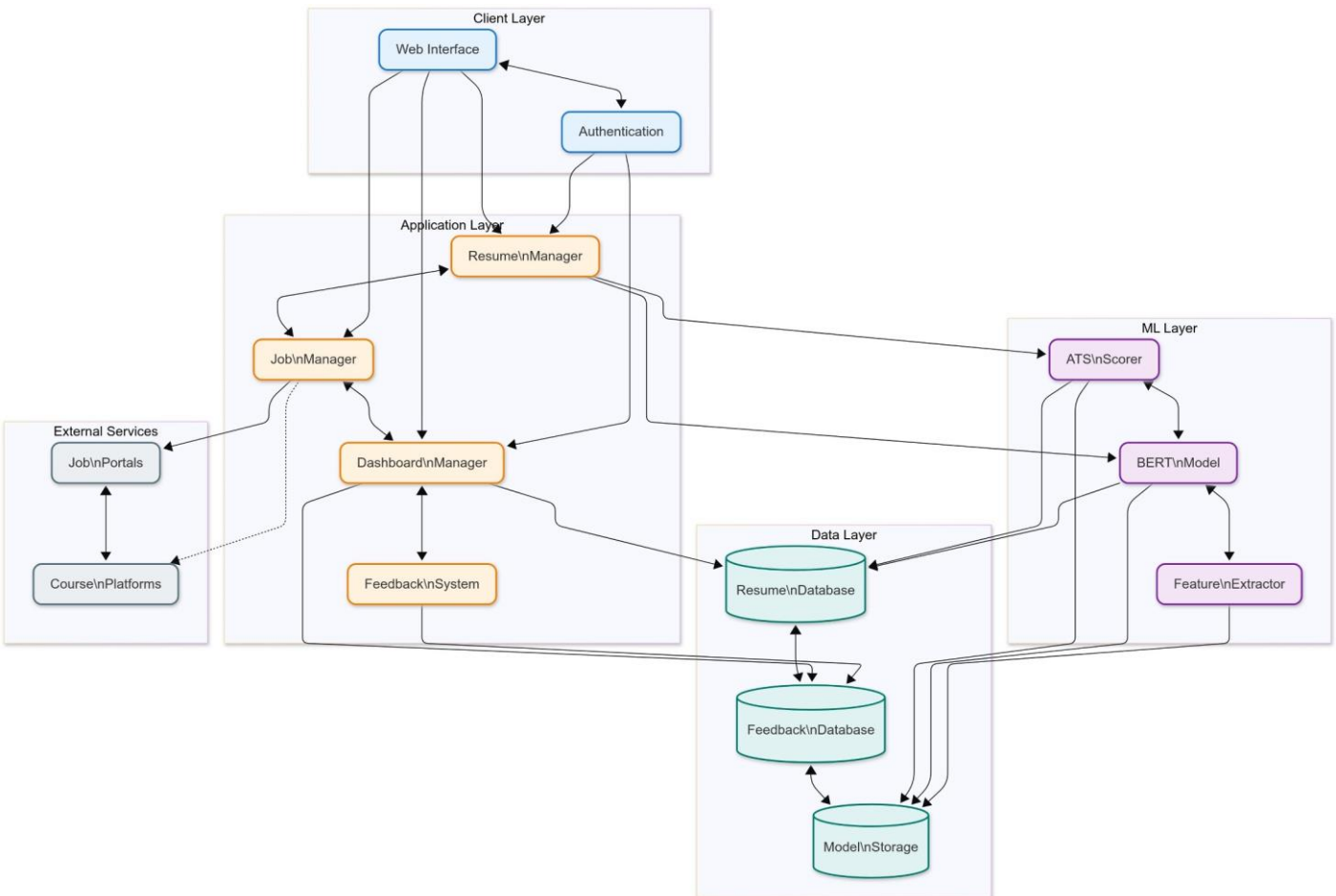
This project aims to develop an AI-powered resume analysis system that helps users improve their resumes for better job prospects. The scope includes:

- **Analyze Resume:** Users can upload resumes in PDF or DOCX format.
- **Resume builder:** Builds a resume based on the information provided by the user.
- **Formatting Evaluation:** Checks layout, font, spacing, and structure for professional presentation.

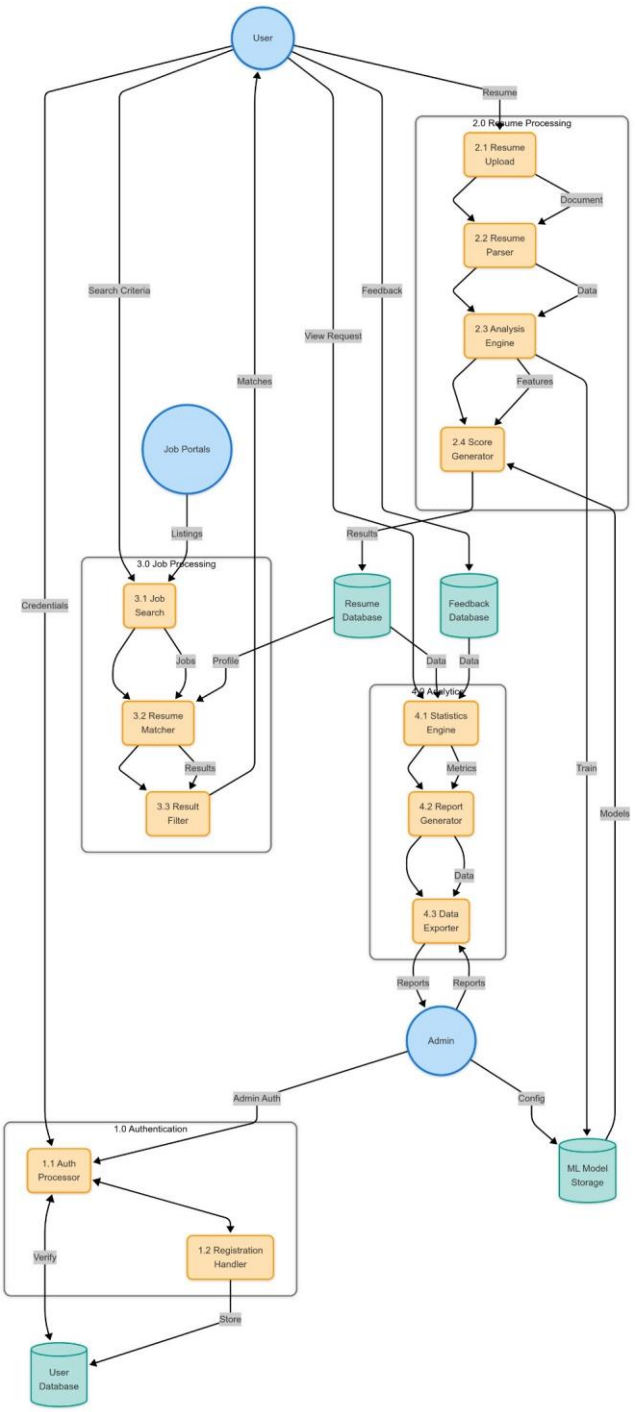
Chapter 4

Proposed System Achitecture

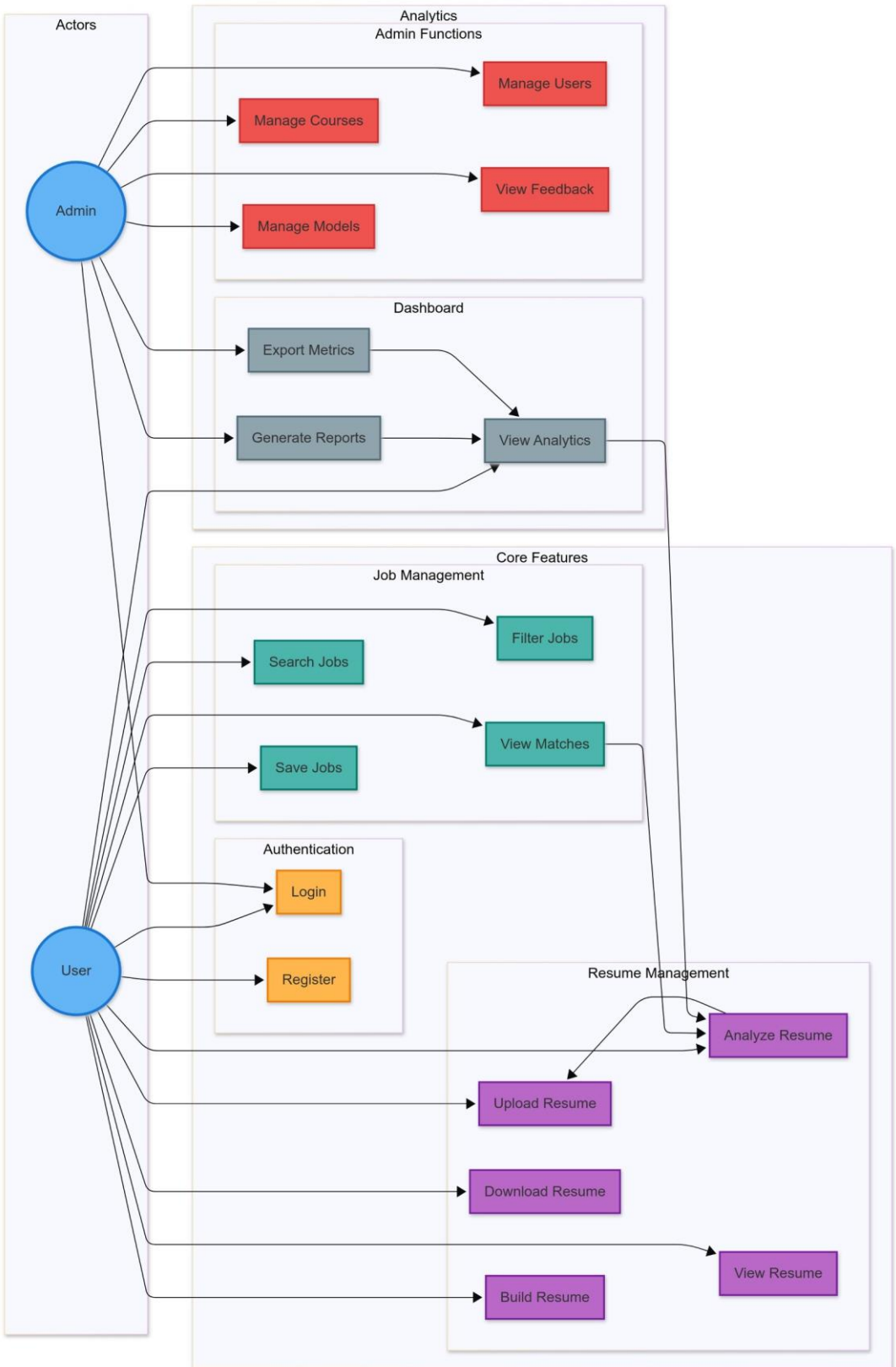
Architecture / Block Diagram



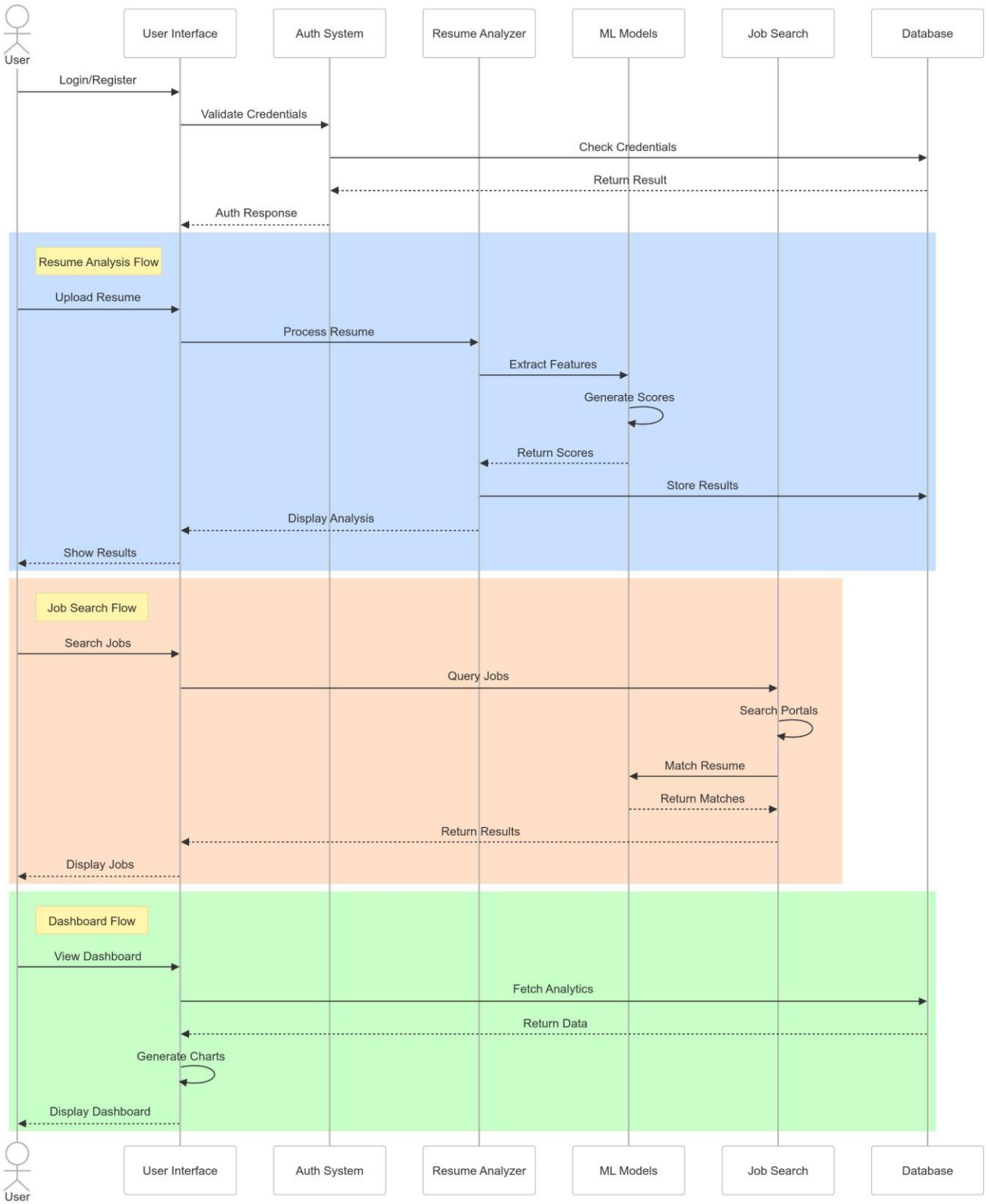
Data Flow Diagram (Level 0, Level 1 S Level 2)



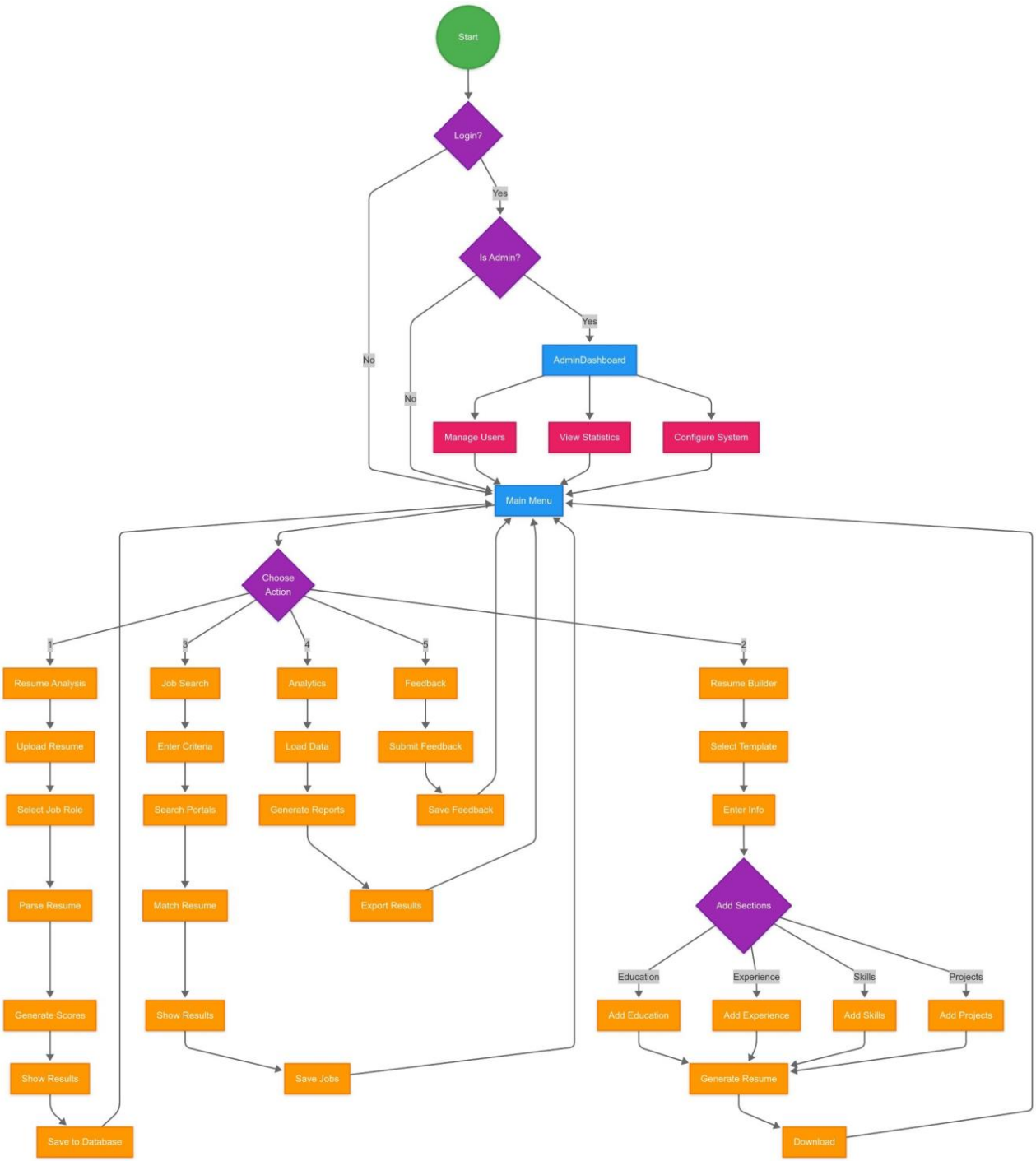
UseCase Diagram



Sequence Diagram



Activity Diagram



Project Planning

Project Planning & Timeline (6 Weeks

Task Category	Week	1	2	3	4	5	6
Planning & Research – Define problem – Finalize features an: ATS							
System Design – Build UI mockups – Design DFDs (Level 0,1, 2) – Plan Data flow							
Backend Development – Implement resume parsers – Integrate NLP/ML models							
Testing & Evaluation – Deploy app – Final presentation/report							

Experimental Setup

Software Requirements:

1. **Programming Language:** Python 3.7 or higher
2. **Framework:** Streamlit (for web UI)
3. **Libraries & Tools:**
    - Pandas, NumPy (data processing)
    - TensorFlow and BERT(ML models)
    - NLTK / spaCy (NLP tasks)
    - python-docx, PyMuPDF (resume parsing)
    - Matplotlib / Plotly (visualization)
    - SQLite (lightweight database)

Operating System: Windows 10/11, macOS, or Linux

Hardware Requirements:

1. **Processor:** Intel Core i5 or AMD Ryzen 5 (or higher)
2. **RAM:** Minimum 8 GB (recommended for ML tasks)
3. **Storage:** At least 20 GB free disk space
4. **GPU:** Optional, but recommended for faster ML model training (e.g., NVIDIA GTX 1050 or higher)
5. **Display:** Standard resolution (recommended 1366x768 or higher)

Chapter 7

Implementation Details

1. Frontend/UI (Streamlit)

- Framework: Streamlit with custom CSS
- Features: Responsive layout, cards, forms, data visualizations

2. Core Modules

- **Resume Analytics**: NLP, ML (TensorFlow/PyTorch), ATS scoring, keyword matching
- **Resume Builder**: PDF/DOCX handling, text extraction, professional templates
- **Job Search Integration**: Job portal links, company info, skill-job match

3. Database (SQLite)

- Stores: Users, resumes, analytics, feedback, admin data

4. Authentication

- Basic login, admin access, session control

5. Analytics Dashboard

- Charts, metrics, performance tracking, PDF reports

6. Utilities

- Resume parser, skill extractor, format validator, score calculators

7. Configuration

- Job roles, learning resources, DB settings

8. Assets & Styling

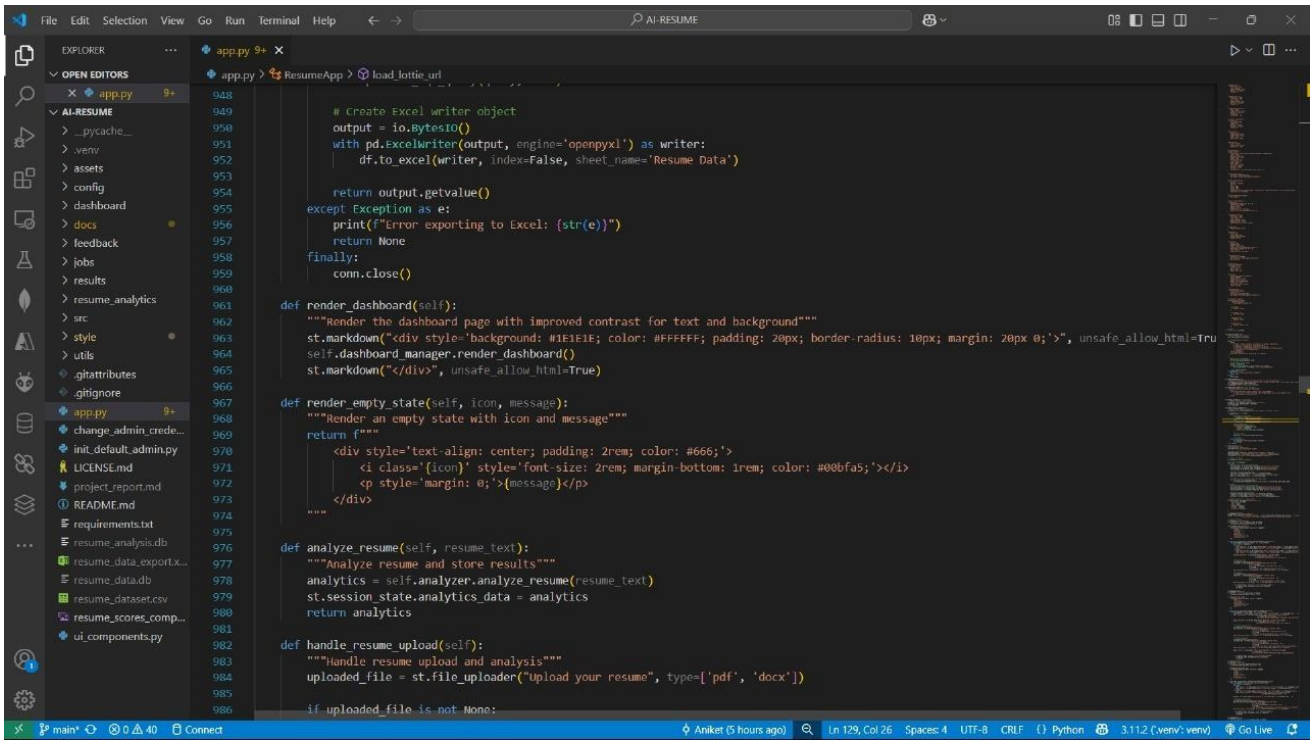
- Logos, images, custom themes, responsive CSS

9. Documentation

- API docs, technical specs, usage guides, diagrams

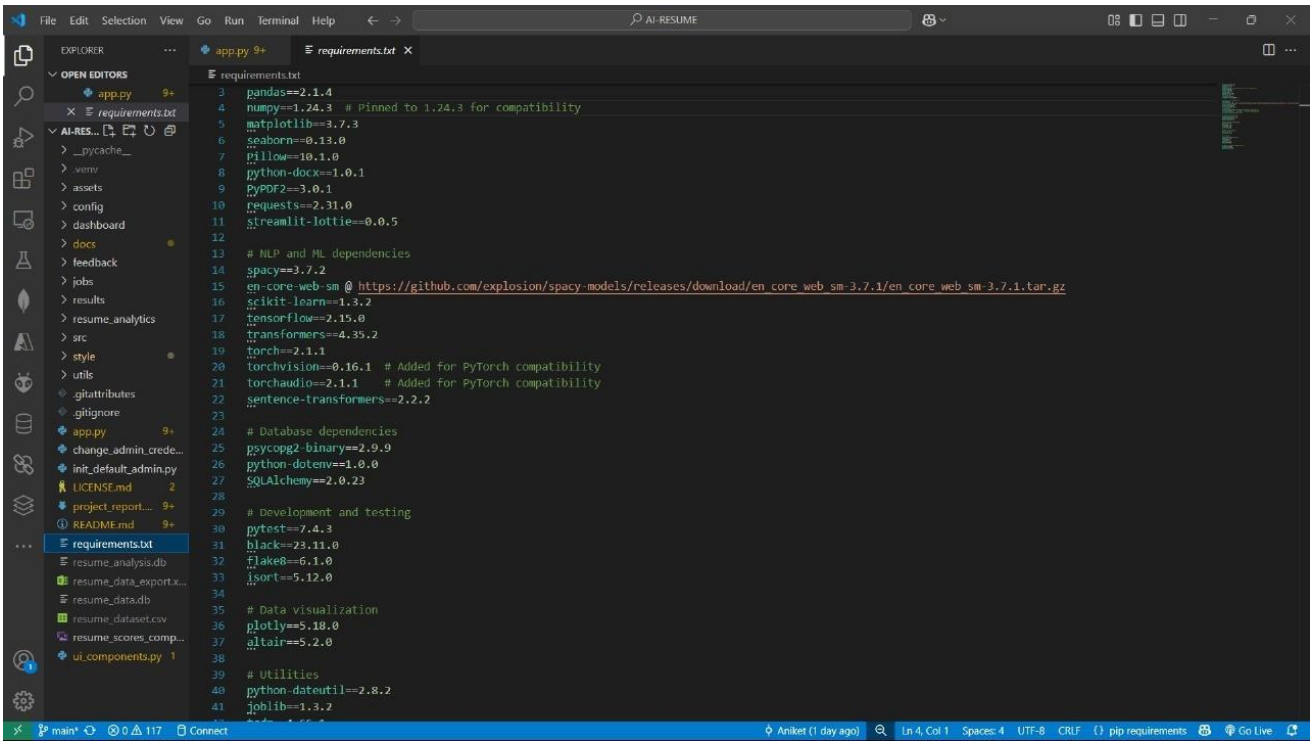
Chapter 8

Result



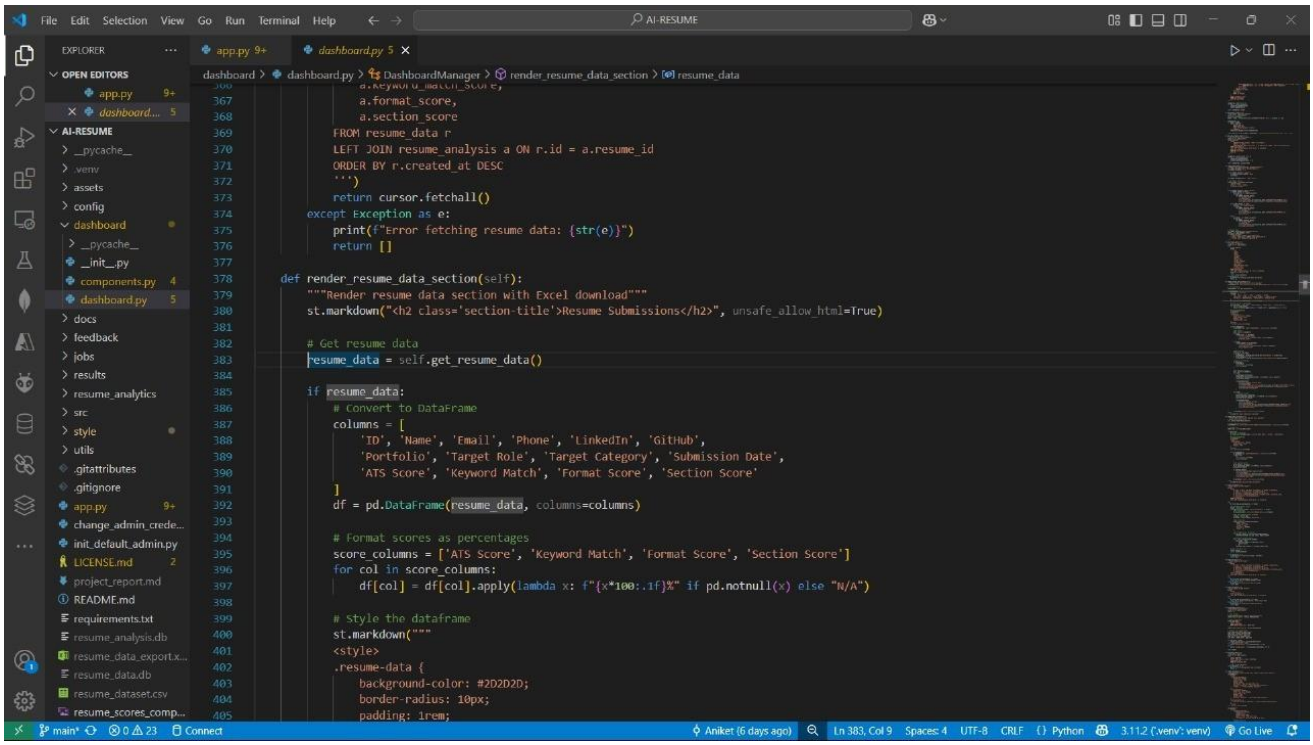
```
            # Create Excel writer object
            output = io.BytesIO()
            with pd.ExcelWriter(output, engine='openpyxl') as writer:
                df.to_excel(writer, index=False, sheet_name='Resume Data')

            return output.getvalue()
        except Exception as e:
            print(f"Error exporting to Excel: {str(e)}")
            return None
        finally:
            conn.close()

    def render_dashboard(self):
        """Render the dashboard page with improved contrast for text and background"""
        st.markdown("<div style='background: #1E1E1E; color: #FFFFFF; padding: 20px; border-radius: 10px; margin: 20px 0;'>", unsafe_allow_html=Tru
        self.dashboard_manager.render_dashboard()
        st.markdown("</div>", unsafe_allow_html=True)

    def render_empty_state(self, icon, message):
        """Render an empty state with icon and message"""
        return f"""
            <div style='text-align: center; padding: 2rem; color: #666;'>
                <i class='{icon}' style='font-size: 2rem; margin-bottom: 1rem; color: #00bfa5;'></i>
                <p style='margin: 0;'>{message}</p>
            </div>
        """

    def analyze_resume(self, resume_text):
        """Analyze resume and store results"""
        analytics = self.analyzer.analyze_resume(resume_text)
        st.session_state.analytics_data = analytics
        return analytics

    def handle_resume_upload(self):
        """Handle resume upload and analysis"""
        uploaded_file = st.file_uploader("Upload your resume", type=['pdf', 'docx'])

        if uploaded_file is not None:
```

App.py



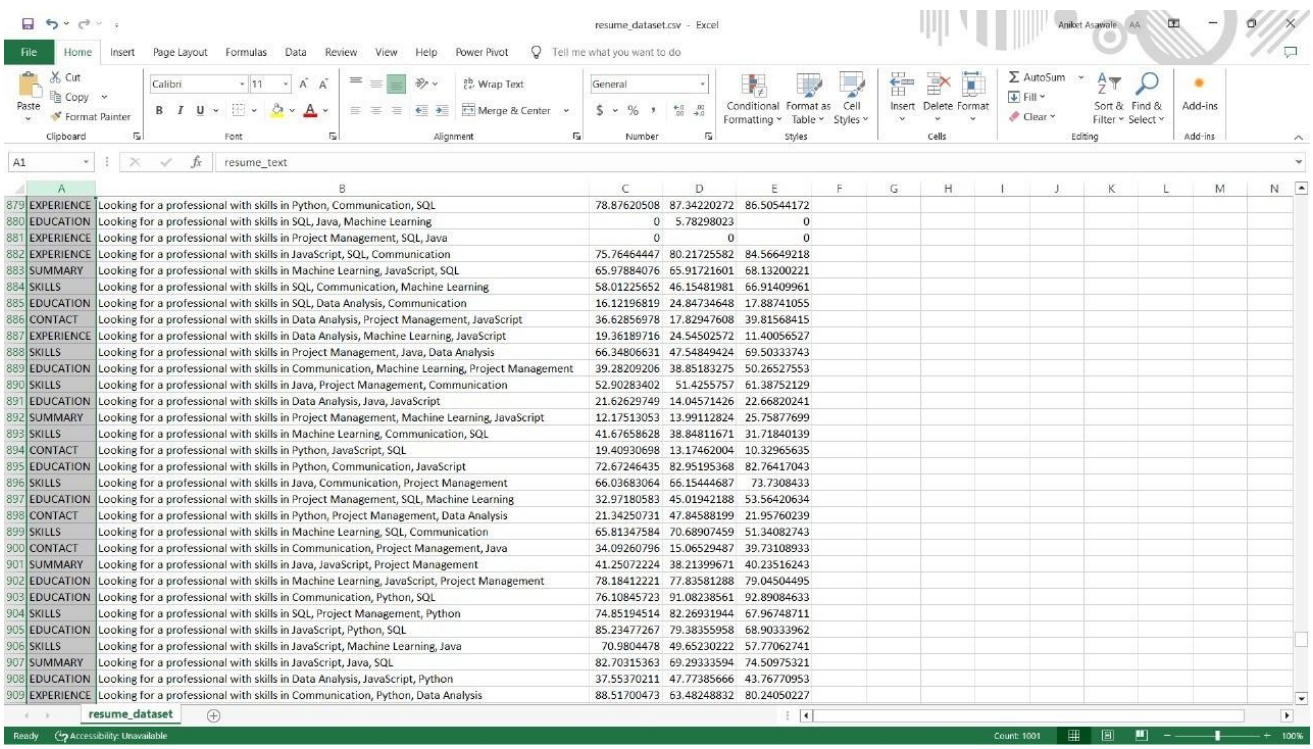
```
pandas==2.1.4
numpy==1.24.3  # Pinned to 1.24.3 for compatibility
matplotlib==3.7.3
seaborn==0.13.0
pillow==10.1.0
python-docx==1.0.1
PyPDF2==3.0.1
requests==2.31.0
streamlit-lottie==0.0.5

# NLP and ML dependencies
spacy==3.7.2
en-core-web-sm @ https://github.com/explosion/spacy-models/releases/download/en_core_web_sm-3.7.1/en_core_web_sm-3.7.1.tar.gz
scikit-learn==1.3.2
tensorflow==2.15.0
transformers==4.35.2
torch==2.1.1
torchvision==0.16.1  # Added for PyTorch compatibility
torchaudio==2.1.1    # Added for PyTorch compatibility
sentence-transformers==2.2.2

# Database dependencies
psycopg2-binary==2.9.9
python-dotenv==1.0.0
SQLAlchemy==2.0.23

# Development and testing
pytest==7.4.3
black==23.11.0
flake8==6.1.0
isort==5.12.0

# Data visualization
plotly==5.18.0
altair==5.2.0

# Utilities
python-dateutil==2.8.2
joblib==1.3.2
```

Backend



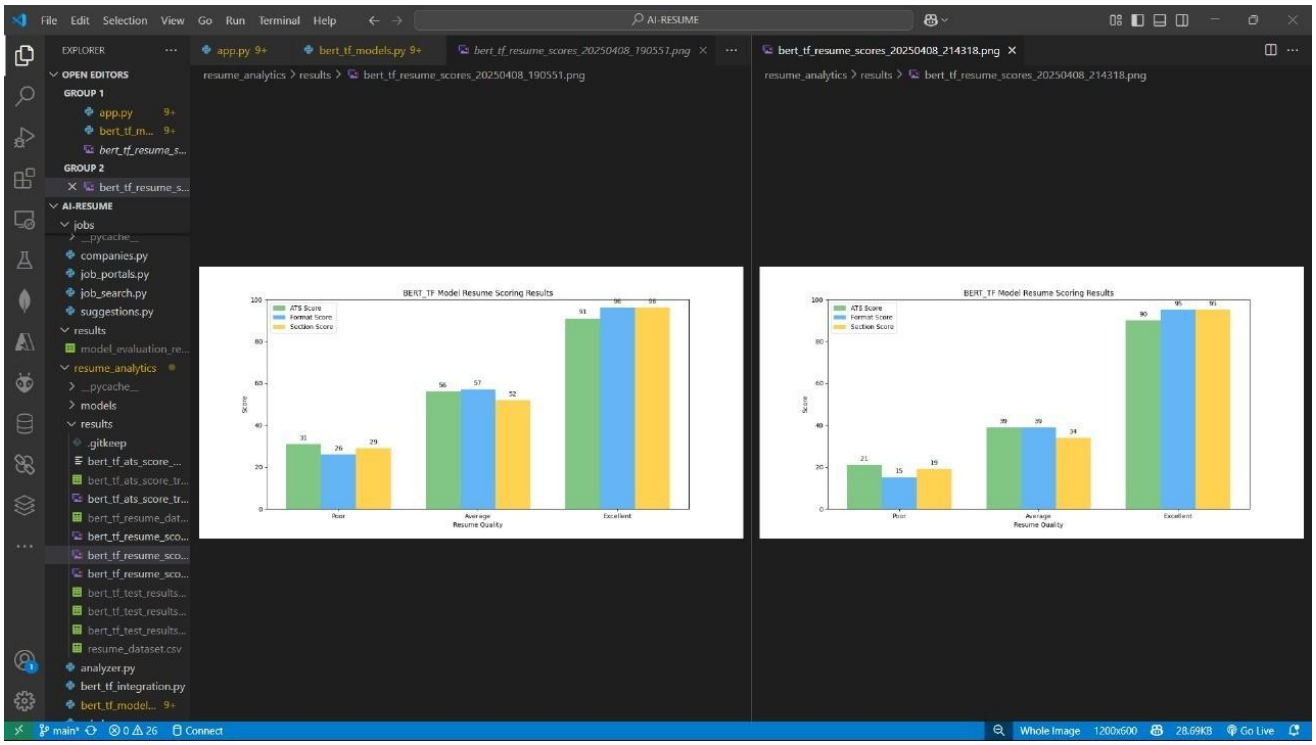
```
                    a.keyword_match_score,
                    a.format_score,
                    a.section_score
                FROM resume_data r
                LEFT JOIN resume_analysis a ON r.id = a.resume_id
                ORDER BY r.created_at DESC
                ''')
                return cursor.fetchall()
            except Exception as e:
                print(f"Error fetching resume data: {str(e)}")
                return []

    def render_resume_data_section(self):
        """Render resume data section with Excel download"""
        st.markdown("<h2 class='section-title'>Resume Submissions</h2>", unsafe_allow_html=True)

        # Get resume data
        resume_data = self.get_resume_data()

        if resume_data:
            # Convert to DataFrame
            columns = [
                'ID', 'Name', 'Email', 'Phone', 'LinkedIn', 'GitHub',
                'Portfolio', 'Target Role', 'Target Category', 'Submission Date',
                'ATS Score', 'Keyword Match', 'Format Score', 'Section Score'
            ]
            df = pd.DataFrame(resume_data, columns=columns)

            # Format scores as percentages
            score_columns = ['ATS Score', 'Keyword Match', 'Format Score', 'Section Score']
            for col in score_columns:
                df[col] = df[col].apply(lambda x: f"{x*100:.1f}%" if pd.notnull(x) else "N/A")

            # Style the dataframe
            st.markdown("""
            <style>
            .resume-data {
                background-color: #2D2D2D;
                border-radius: 10px;
                padding: 1rem;
```

Resume Data.py



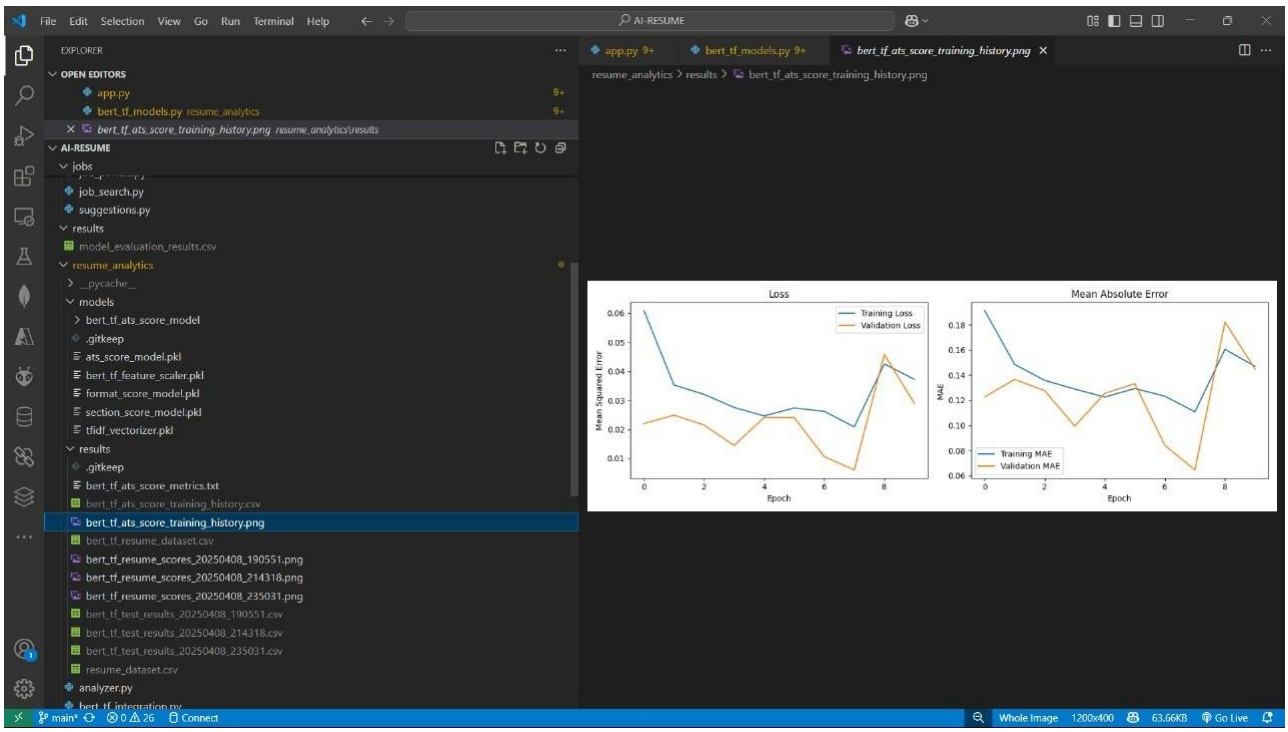
	A	B	C	D	E
879	EXPERIENCE	Looking for a professional with skills in Python, Communication, SQL	78.87620508	87.34220272	86.50544172
880	EDUCATION	Looking for a professional with skills in SQL, Java, Machine Learning	0	5.78298023	0
881	EXPERIENCE	Looking for a professional with skills in Project Management, SQL, Java	0	0	0
882	EXPERIENCE	Looking for a professional with skills in JavaScript, SQL, Communication	75.76464447	80.21725582	84.56649218
883	SUMMARY	Looking for a professional with skills in Machine Learning, JavaScript, SQL	65.97884076	65.91721601	68.13200221
884	SKILLS	Looking for a professional with skills in SQL, Communication, Machine Learning	58.01225652	46.15481981	66.91409961
885	EDUCATION	Looking for a professional with skills in SQL, Data Analysis, Communication	16.12196819	24.84734648	17.88741055
886	CONTACT	Looking for a professional with skills in Data Analysis, Project Management, JavaScript	36.62856978	17.82947608	39.81568415
887	EXPERIENCE	Looking for a professional with skills in Data Analysis, Machine Learning, JavaScript	19.36189716	24.54502572	11.40056527
888	SKILLS	Looking for a professional with skills in Project Management, Java, Data Analysis	66.34806631	47.54849424	69.50333743
889	EDUCATION	Looking for a professional with skills in Communication, Machine Learning, Project Management	39.28209206	38.85183275	50.26527553
890	SKILLS	Looking for a professional with skills in Java, Project Management, Communication	52.90283402	51.4255757	61.38752129
891	EDUCATION	Looking for a professional with skills in Data Analysis, Java, JavaScript	21.62629749	14.04571426	22.66820241
892	SUMMARY	Looking for a professional with skills in Project Management, Machine Learning, JavaScript	12.17513053	13.99112824	25.75877699
893	SKILLS	Looking for a professional with skills in Machine Learning, Communication, SQL	41.67658628	38.84811671	31.71840139
894	CONTACT	Looking for a professional with skills in Python, JavaScript, SQL	19.40930698	13.17462004	10.32965635
895	EDUCATION	Looking for a professional with skills in Python, Communication, JavaScript	72.67246435	82.95195368	82.76417043
896	SKILLS	Looking for a professional with skills in Java, Communication, Project Management	66.03683064	66.15444687	73.7308433
897	EDUCATION	Looking for a professional with skills in Project Management, SQL, Machine Learning	32.97180583	45.01942188	53.56420634
898	CONTACT	Looking for a professional with skills in Python, Project Management, Data Analysis	21.34250731	47.84588199	21.95760239
899	SKILLS	Looking for a professional with skills in Machine Learning, SQL, Communication	65.81347584	70.68907459	51.34082743
900	CONTACT	Looking for a professional with skills in Communication, Project Management, Java	34.09260796	15.06529487	39.73108933
901	SUMMARY	Looking for a professional with skills in Java, JavaScript, Project Management	41.25072224	38.21399671	40.23516243
902	EDUCATION	Looking for a professional with skills in Machine Learning, JavaScript, Project Management	78.18412221	77.83581288	79.04504495
903	EDUCATION	Looking for a professional with skills in Communication, Python, SQL	76.10845723	91.08238561	92.89084633
904	SKILLS	Looking for a professional with skills in SQL, Project Management, Python	74.85194514	82.26931944	67.96748711
905	EDUCATION	Looking for a professional with skills in JavaScript, Python, SQL	85.23477267	79.38355958	68.90333962
906	SKILLS	Looking for a professional with skills in JavaScript, Machine Learning, Java	70.9804478	49.65230222	57.77062741
907	SUMMARY	Looking for a professional with skills in JavaScript, Java, SQL	82.70315363	69.29333594	74.50975321
908	EDUCATION	Looking for a professional with skills in Data Analysis, JavaScript, Python	37.55370211	47.77385666	43.76770953
909	EXPERIENCE	Looking for a professional with skills in Communication, Python, Data Analysis	88.51700473	63.48248832	80.24050227

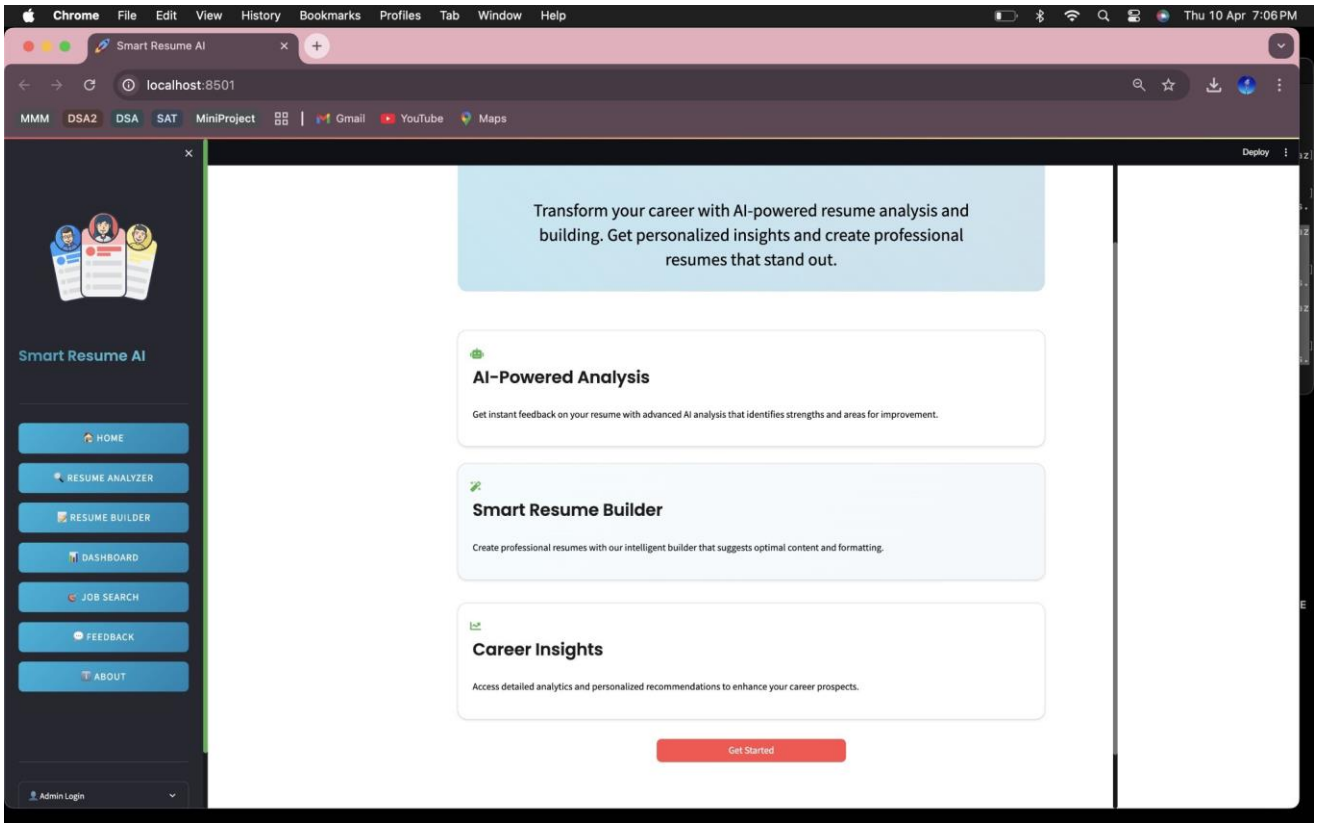
Data csv



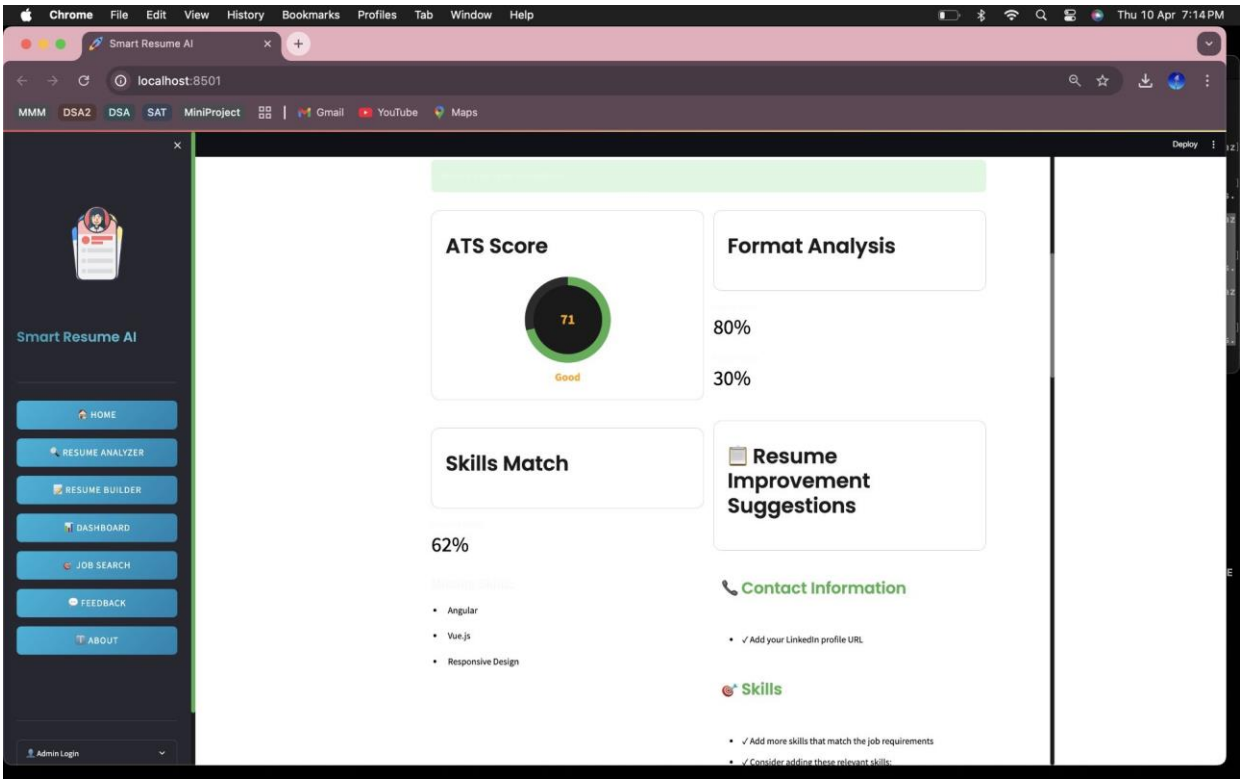
Accuracy Model

Models



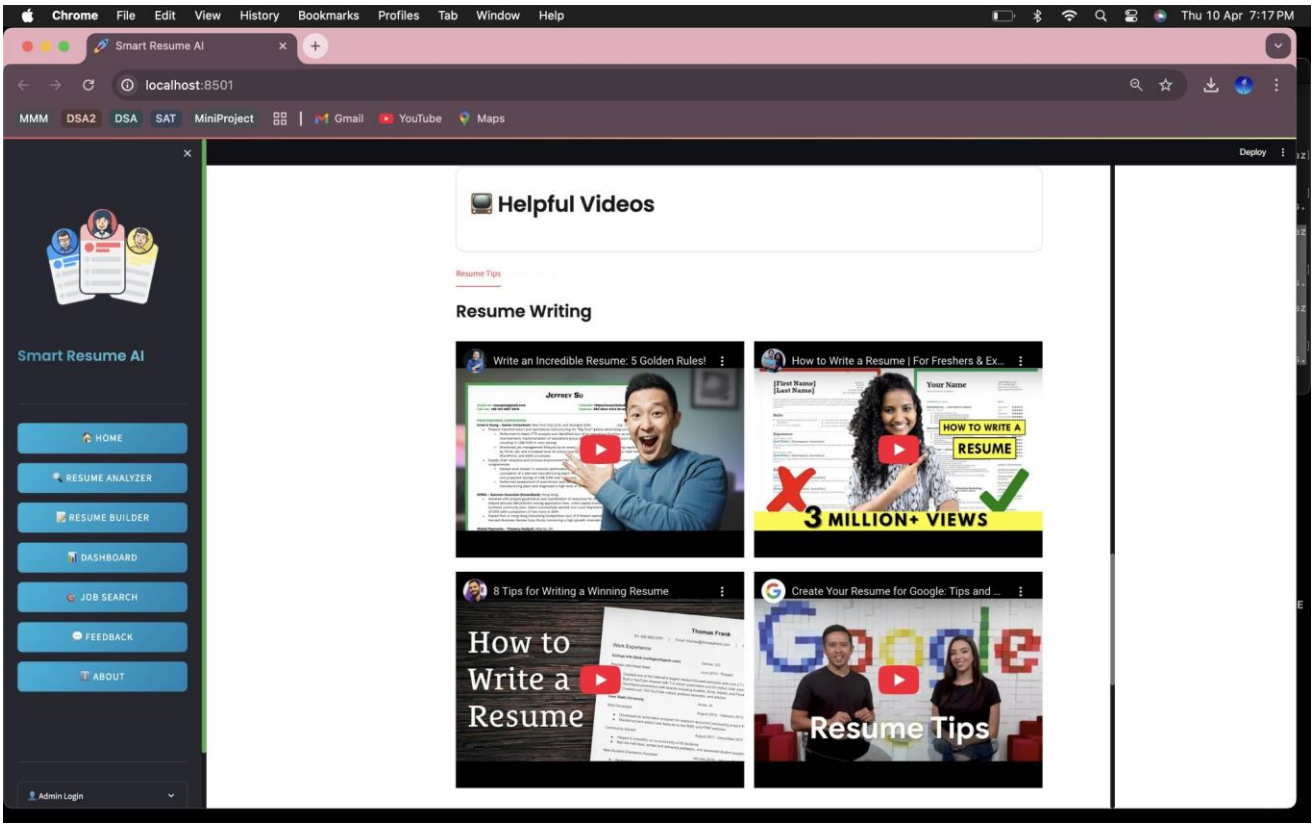


HomePage

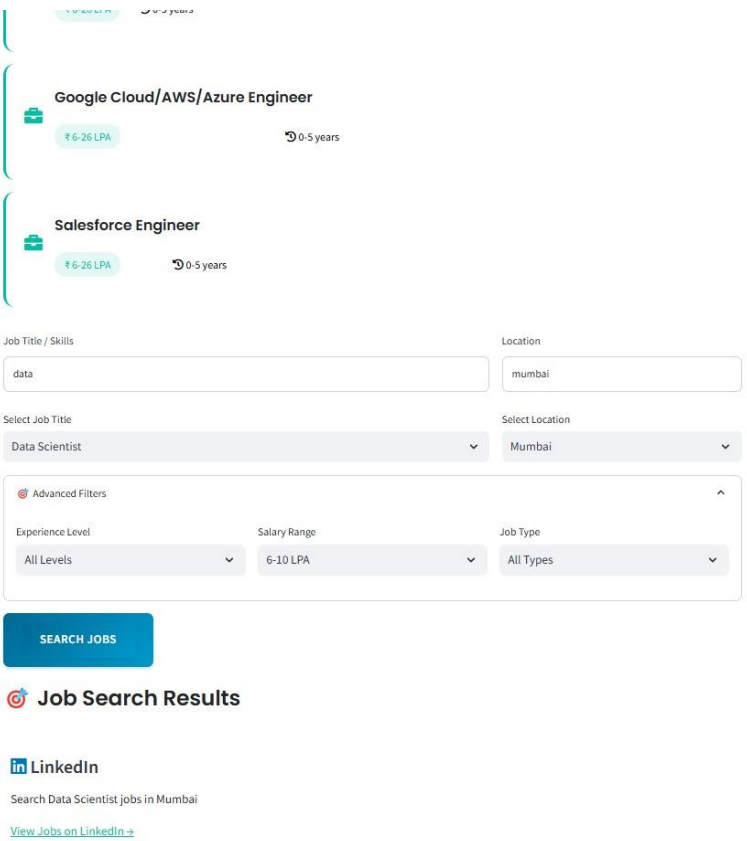


ATS Score

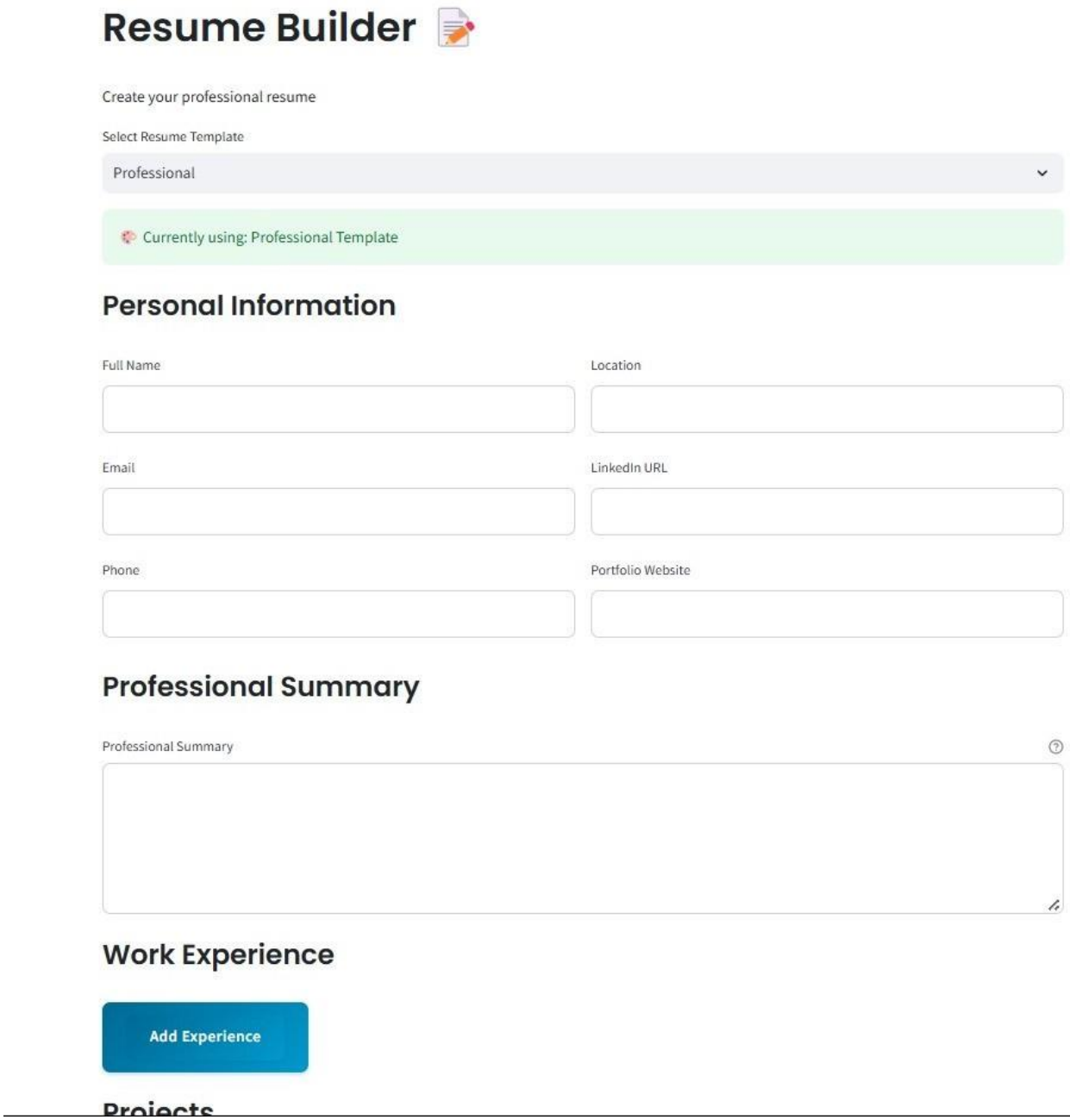
24



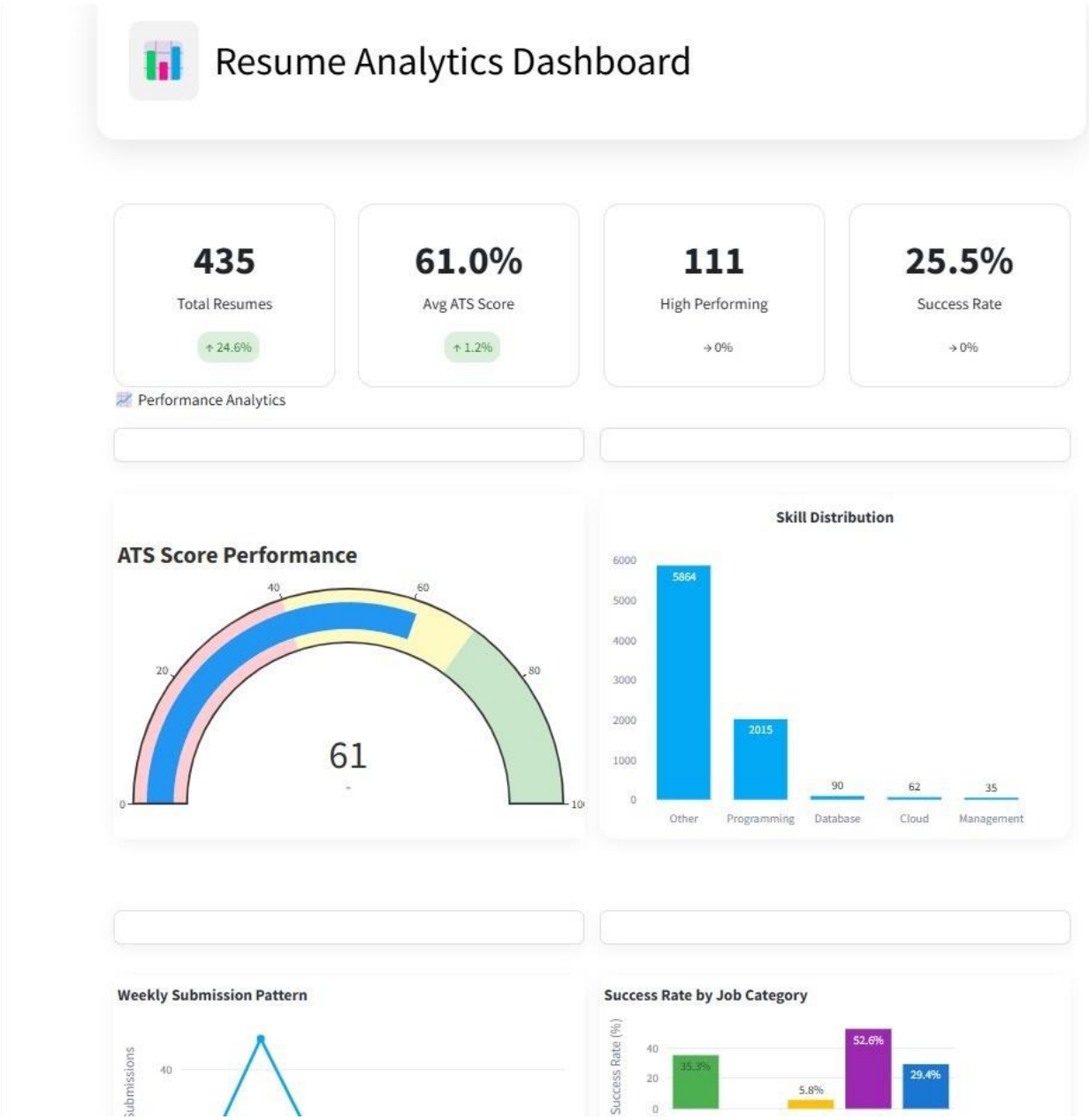
Recommendations



Resume Builder



Resume Dashboard



Chapter 9

Conclusion

The AI Resume Analyzer project shows how artificial intelligence can help job seekers improve their resumes. By using machine learning and natural language processing, the system gives smart feedback and suggestions to make resumes more professional and better matched to job descriptions. It helps users create ATS-friendly resumes that increase their chances of getting shortlisted. The platform is easy to use and provides a score along with clear, actionable tips. It can be expanded in the future to support multiple languages, connect with job portals, and offer real-time comparisons with industry standards. This project is useful not only for individuals but also for colleges and HR teams who want to make the resume screening process more effective. This system helps bridge the gap between candidates and recruiters by improving the quality of resumes and supporting career growth.

Chapter 10

References

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