Meerut Institute of Engineering and Technology, Meerut

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MINI PROJECT REPORT

On

CarrerCraft ATS Optimized Resume Analyzer Using Gemini

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

Submitted to-

Ms. Prerna Chaudhary

(Department of Computer Science & Engineering)

Submitted by-

Siddharth Kumar	**(2200680100312)**
Sparsh Gupta	**(2200680100321)**
Sujal Rastogi	**(2200680100323)**
Suvansh	**(2200680100325)**

5th SEMESTER DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING/IT/EC/EE/BT/ME

MEERUT INSTITUTE OF ENGINEERING AND TECHNOLOGY, MEERUT

DECLARATION

We hereby declare that the project entitled - **CarrerCraft ATS Optimized Resume Analyzer Using Gemini**, which is being submitted as **Mini Project** in department of **Computer Science and Engineering** to Meerut Institute of Engineering and Technology, Meerut (U.P.) is an authentic record of our genuine work done under the guidance of Prof. **Ms. Prerna Chaudhary** of Computer Science and Engineering, Meerut Institute of Engineering and Technology, Meerut.

Date: 09/12/2024

Name of student: Siddharth Kumar,
Sparsh Gupta,
Sujal Rastogi,
Suvansh

Place: MIET Meerut

(Roll no.) 2200680100312,
2200680100321,
2200680100323,
2200680100325

CERTIFICATE

This is to certify that mini project report entitled – "**CarrerCraft ATS Optimized Resume Analyzer Using Gemini**" submitted by "Siddharth Kumar, Sparsh Gupta, Sujal Rastogi, Suvansh" has been carried out under the guidance of Prof. "**Ms. Prerna Chaudhary**" of Computer Science and Engineering, Meerut Institute of Engineering and Technology, Meerut. This project report is approved for Mini Project (BCS-554) in **5th semester** in **Computer Science and Engineering** from Meerut Institute of Engineering and Technology, Meerut.

Internal Examiner: Ms. Prerna Chaudhary

Date: 09/12/2024

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Date:09/12/2024

Student name: Siddharth Kumar,
Sparsh Gupta,
Sujal Rastogi,
Suvansh

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Chapter 1

Introduction

- **Background on ATS (Applicant Tracking Systems):**
    - **Definition and Purpose**: Explain what Applicant Tracking Systems are and their role in the recruitment process.
    - **Functionality**: Describe how ATS works, including resume parsing, keyword matching, and candidate ranking.
    - **Prevalence**: Provide statistics or trends on the use of ATS in hiring practices across industries.

- **Importance of Optimized Resumes in Job Applications:**
    - **First Impression**: Discuss how a resume serves as the first impression for job candidates and its impact on hiring decisions.
    - **ATS Compatibility**: Explain the significance of tailoring resumes for ATS to increase visibility and chances of selection.
    - **Competitive Advantage**: Highlight how optimized resumes can give candidates a competitive edge in a crowded job market.

- **Objectives of the Report:**
    - **Purpose of the Report**: Briefly state the goals of the project report, such as to present the development and functionality of CareerCraft.
    - **Research Questions**: List any specific questions the report aims to answer, such as how effective the Gemini model is in analyzing resumes compared to traditional methods.

- **Structure of the Report:**
    - **Overview of Sections**: Provide a brief overview of the organization of the report, summarizing what each subsequent section will cover.

Chapter 2

Project Overview

- **Objectives of the CareerCraft Project:**

    - **Primary Goal**: State the main goal of CareerCraft, which is to develop an ATS-optimized resume analyzer that utilizes the Gemini model.
    - **Specific Objectives**:
        - To improve the efficiency of resume screening for recruiters
        - To enhance the chances of candidates being selected by optimizing their resumes based on ATS criteria.
        - To provide users with actionable insights and recommendations for resume improvements.

- **Scope and Limitations:**
    - **Scope**:
        - **Target Users**: Identify the primary users of the system (e.g., job seekers, recruiters, HR professionals).
        - **Functionalities**: Outline key features such as resume parsing, keyword optimization, and personalized feedback.
        - **Technological Integration**: Mention integration with existing ATS or HR systems, if applicable.

    - **Limitations**:
        - **Dataset Constraints**: Discuss any limitations regarding the dataset used for training the Gemini model, such as size or diversity.
        - **Performance Factors**: Acknowledge factors that may affect performance, such as variations in ATS algorithms or individual preferences of recruiters.
        - **User Dependency**: Note that the effectiveness of the tool may depend on user input and accuracy in resume details.

- **Target Audience:**

    - **Job Seekers**: Describe how the tool assists individuals in crafting optimized resumes tailored for ATS.

- **Recruiters and Employers**: Explain how the system benefits recruiters by streamlining the candidate selection process and improving the quality of shortlisted candidates.
- **Career Coaches**: Mention the potential for career coaches to use the tool to help clients enhance their resumes.

- **Significance of the Project:**
  - **Impact on Job Market**: Discuss the importance of optimizing resumes in today's job market, where ATS is widely used.
  - **Advancements in AI and Machine Learning**: Highlight how the integration of the Gemini model represents advancements in AI-driven tools for career development

  .
- **Methodology Overview:**
  - **Approach**: Briefly describe the methodology used in the project, such as data collection, model training, and user testing.
  - **Development Tools**: Mention the technologies and tools employed (e.g., Streamlit for the UI, programming languages, libraries for the Gemini model).

Chapter 3

Literature Review

- **Existing Solutions for Resume Analysis:**

    - **Overview of Tools**: Summarize popular tools and platforms currently available for resume analysis (e.g., Jobscan, Resumake, etc.).
    - **Functionality Comparison**: Compare the features of these tools, such as ATS optimization, keyword suggestions, and user feedback mechanisms.
    - **Limitations**: Discuss any shortcomings identified in existing solutions, such as lack of personalization, limited data analysis, or reliance on outdated ATS algorithms.

- **Overview of ATS Functionality and Challenges:**
    - **How ATS Works**: Explain the process of how ATS parses resumes, ranks candidates, and filters applications.
        - **Keyword Matching:** Discuss the importance of specific keywords and phrases in resume content.
        - **Formatting Considerations**: Highlight how formatting can impact ATS parsing and candidate visibility.

    - **Challenges Faced:**
        - **Bias in Algorithms**: Explore issues related to bias in ATS algorithms and the implications for diverse candidates.
        - **Inconsistency Across Systems**: Discuss the variability in how different ATS systems parse and rank resumes, leading to inconsistencies in candidate evaluation.
        - **Candidate Frustration**: Address the frustration faced by candidates who struggle to optimize their resumes for ATS.

- **Introduction to the Gemini Model:**
    - **Background**: Provide a brief overview of the Gemini model, its origins, and its relevance in the field of machine learning and natural language processing (NLP).
    - **Technical Features**: Describe the unique features of the Gemini model that make it suitable for resume analysis, such as:

- **Contextual Understanding:** Highlight the model's ability to understand context and semantics in resumes.
- **Adaptability**: Discuss how the model can adapt to different industries and job roles.

3.4 Relevance of Machine Learning in Resume Optimization:

- **Trends in AI for Recruitment**: Summarize recent trends in using AI and machine learning in recruitment and talent acquisition.
- **Effectiveness of ML Algorithms**: Discuss studies or findings that illustrate the effectiveness of machine learning algorithms in improving the resume screening process.
- **Potential for Improvement**: Highlight opportunities for integrating more advanced models, like Gemini, to enhance resume optimization strategies.

3.5 Summary of Gaps in Current Research:

- **Identification of Gaps**: Identify gaps in the current literature regarding ATS optimization, resume analysis, and the use of AI models like Gemini.
- **Opportunity for Innovation**: Discuss how CareerCraft aims to address these gaps by combining ATS optimization with advanced machine learning techniques.

Chapter 4

System Architecture

- **Overall Architecture of the CareerCraft Application:**
    - **High-Level Overview**: Present a diagram of the system architecture that illustrates the various components and how they interact.
    - **Component Description:**
        - **Frontend**: Describe the user interface built using Streamlit, highlighting its interactive features.
        - **Backend**: Outline the server-side processes that handle data processing, resume analysis, and model inference.

- **Components of the System:**
    - **Resume Upload Module:**
        - **Functionality:** Explain how users can upload their resumes in various formats (e.g., PDF, DOCX).
        - **File Parsing**: Discuss the parsing mechanism that extracts relevant information from uploaded resumes.
    - **Gemini Model Integration**:
        - **Model Loading**: Detail how the Gemini model is integrated into the backend and how it processes resumes.
        - **Inference Process**: Explain the steps involved in making predictions or providing recommendations based on resume content.
    - **ATS Optimization Engine**:
        - **Keyword Analysis:** Describe the algorithms used to analyze resumes for ATS compatibility, including keyword matching and relevance scoring.
        - **Formatting Assessment**: Discuss how the system evaluates formatting and structure to ensure ATS-friendliness.
    - **User Feedback System**:

    - **Feedback Generation:** Outline how the system generates personalized feedback and recommendations for resume improvement.
    - **Visualization**: Explain how the feedback is presented to the user, possibly using graphs or scores for clarity.

- **Data Flow and Processing:**

    - **User Interaction Flow**: Describe the sequence of interactions a user has with the application from uploading a resume to receiving feedback.
        - **Input Stage:** Detail how data is captured when a user uploads their resume.
        - **Processing Stage**: Explain how the data is sent to the Gemini model for analysis and how the optimization engine processes it.
        - **Output Stage**: Describe how results are compiled and presented back to the user.

    - **Data Handling:**

        - **Storage Solutions**: Discuss any databases or storage solutions used to manage user data, session data, and model results.
        - **Data Privacy and Security**: Address how user data is handled with respect to privacy and security standards.

- **Technology Stack:**

    - **Frontend Technologies**: List the technologies and frameworks used for building the user interface (e.g., Streamlit, HTML, CSS).
    - **Backend Technologies**: Specify the programming languages, libraries, and frameworks used in the backend (e.g., Python, Flask, TensorFlow for the Gemini model).
    - **Database Management**: Mention any database systems used (e.g., SQLite, PostgreSQL) for storing user data and processing results.

- **Summary of System Architecture:**

    - **Overall Functionality**: Summarize how the system architecture supports the core functionalities of the CareerCraft application.
    - **Scalability Considerations**: Briefly discuss the scalability of the architecture and potential areas for future enhancement or integration with other systems.

Chapter 5

Gemini Model Overview

- **Description of the Gemini Model:**
    - **Model Background**: Provide an introduction to the Gemini model, its development, and the primary purpose it serves in the context of resume analysis and optimization.
    - **Architecture**: Briefly describe the architecture of the Gemini model, including its layers and components, focusing on aspects relevant to natural language processing (NLP).
- **Training Methodology and Dataset Used:**
    - **Training Process**:
        - **Data Collection**: Explain the sources of data used to train the Gemini model, such as publicly available resumes, job descriptions, or synthetic datasets.
        - **Preprocessing**: Discuss the preprocessing steps taken to clean and prepare the data for training, including tokenization, normalization, and handling of different formats.
    - **Model Training**:
        - **Supervised Learning:** Describe the supervised learning approach if applicable, detailing how the model learns from labeled data.
        - **Training Techniques**: Mention any techniques used to enhance model performance, such as transfer learning or data augmentation.
    - **Dataset Characteristics**:
        - **Diversity and Size:** Provide insights into the diversity of the dataset in terms of industries, job roles, and experience levels.
        - **Evaluation Metrics**: List the metrics used to evaluate the model's performance during training (e.g., accuracy, F1 score, precision, recall).
- **Advantages of Using Gemini for Resume Analysis:**

- **Contextual Understanding**: Discuss how the Gemini model leverages its architecture to understand the context and semantics of resumes, allowing for better analysis of content.
- **Adaptability**: Highlight the model's ability to adapt to various industries and job roles, making it versatile in analyzing different types of resumes.
- **Enhanced Feedback**: Explain how the model provides richer, more detailed feedback compared to traditional methods, helping candidates improve their resumes more effectively.

- **Model Evaluation and Performance:**

  - **Testing and Validation:**

    - **Cross-Validation:** Describe the cross-validation techniques used to ensure the model's reliability and generalizability.
    - **Performance Metrics:** Present the key performance metrics obtained during evaluation, including specific results related to ATS optimization tasks.
  - **Comparative Analysis:** Discuss how the performance of the Gemini model compares to other existing models or methods used in resume analysis, providing relevant data or case studies.

- **Future Improvements and Research Directions:**

  - **Potential Enhancements**: Identify areas where the Gemini model can be further improved, such as incorporating user feedback or expanding the dataset for better training.
  - **Research Opportunities**: Suggest potential research avenues that could explore the intersection of AI, recruitment, and resume optimization, particularly in light of emerging trends in the job market.

- **Summary of the Gemini Model's Role in CareerCraft:**

  - **Integration into the System**: Summarize how the Gemini model integrates into the CareerCraft application and its significance in enhancing the overall functionality.
  - **Impact on User Experience**: Briefly discuss how the model's capabilities improve the user experience for job seekers, making the resume optimization process more effective.

Chapter 6

Resume Parsing and Analysis

- **Techniques for Parsing Resumes:**
    - **File Upload and Parsing:**
        - **Supported Formats**: Describe the file formats accepted by the system (e.g., PDF, DOCX, TXT) and how the system handles each format.
        - **Parsing Libraries**: Mention any libraries or tools used for resume parsing (e.g., PyPDF2 for PDFs, python-docx for DOCX) and their roles in extracting text and relevant data.
    - **Text Extraction Process**:
        - **Tokenization:** Explain how the extracted text is tokenized into words and phrases, preparing it for further analysis.
        - **Data Structuring**: Discuss how the unstructured text is transformed into a structured format (e.g., JSON or dictionaries) that contains relevant sections like work experience, education, skills, etc.
- **Criteria for ATS Optimization:**
    - **Keyword Relevance:**
        - **Importance of Keywords**: Discuss the role of keywords in ATS algorithms and how they influence resume ranking.
        - **Keyword Extraction**: Describe the methods used to extract and identify essential keywords from job descriptions and industry standards.
    - **Formatting Guidelines**:
        - **ATS-Friendly Formatting**: Outline the key formatting practices that make resumes compatible with ATS (e.g., using standard headings, avoiding complex layouts).

        - **Visual Elements**: Discuss the impact of visual elements such as tables, graphics, or images on ATS parsing and the recommendations made by the system regarding their use.

    - **Section Importance**:

        - **Critical Resume Sections**: Identify which sections of a resume (e.g., summary, experience, education, skills) are most important for ATS and how the system evaluates them.
        - **Weighting Criteria**: Explain how different sections may be weighted differently based on ATS preferences and job requirements.

- **Key Metrics and Indicators for Evaluation:**

    - **Resume Score:**

        - **Scoring System**: Describe the scoring mechanism used to evaluate the effectiveness of a resume in relation to ATS requirements.
        - **Breakdown of Scores**: Explain how scores are derived from various factors such as keyword match percentage, formatting compliance, and overall content quality.

    - **Feedback Metrics**:

        - **Actionable Insights**: Discuss the types of feedback generated by the system, such as suggestions for improving keyword usage, formatting changes, or additional content recommendations.
        - **Visualization of Results**: Explain how results are presented to users, possibly through graphs or color-coded indicators for easy interpretation.

- **Resume Analysis Process:**

    - **Analysis Workflow:**

        - **Step-by-Step Process**: Outline the workflow from resume upload to analysis, detailing each step and its importance in the overall evaluation process.
        - **Integration with the Gemini Model**: Describe how the analysis interacts with the Gemini model to generate insights and recommendations.

- **User Interaction:**
    - **User Feedback Loop**: Explain how users can provide feedback on the generated analysis and recommendations, potentially influencing future iterations of the model.

- **Challenges in Resume Parsing and Analysis:**
    - **Parsing Errors**: Discuss common challenges encountered during the parsing process, such as dealing with inconsistent formatting or special characters.
    - **Complex Resumes**: Address difficulties in analyzing resumes that contain unconventional structures, languages, or layouts.
    - **Variability in ATS Systems**: Highlight how different ATS systems have varied parsing capabilities, which can affect the consistency of analysis results.

- **Summary of Resume Parsing and Analysis:**
    - **Significance in CareerCraft**: Summarize the importance of effective resume parsing and analysis in the context of the CareerCraft application.
    - **Impact on User Success**: Briefly discuss how the analysis enhances the chances of user success in navigating ATS and landing job interviews.

Chapter 7

User Interface Design

- **Overview of the Streamlit Framework:**
  - **Introduction to Streamlit:**
    - Describe what Streamlit is and its suitability for building interactive web applications, especially in data science and machine learning.
    - Highlight its key features, such as easy integration with Python, real-time updates, and user-friendly components.
  - **Benefits of Using Streamlit**:
    - Discuss the advantages of using Streamlit for the CareerCraft application, such as rapid development, flexibility, and the ability to create interactive visualizations.
  - **Benefits of Using Streamlit:**
    - Discuss the advantages of using Streamlit for the CareerCraft application, such as rapid development, flexibility, and the ability to create interactive visualizations.

- **Key Features of the User Interface:**
  - **User-Friendly Design**:
    - **Intuitive Navigation**: Explain how the UI is designed for easy navigation, allowing users to upload resumes and access analysis results seamlessly.
    - **Clear Call-to-Action Buttons**: Describe the prominent buttons and links that guide users through the process of using the application.
  - **Input Sections:**
    - Resume Upload Area: Detail the design of the resume upload section, including drag-and-drop functionality or file selection options.
    - Job Description Input: Discuss any features allowing users to input job descriptions for targeted resume optimization.

- **Results Display:**

    - Analysis Summary: Explain how the analysis results are presented, including overall scores and detailed breakdowns of specific resume sections.
    - Visual Feedback: Discuss the use of charts, graphs, or color-coded indicators to enhance the presentation of results and make them easier to interpret.

- **Animation and User Engagement Strategies:**

    - **Use of Animations:**

        - **Purpose of Animations:** Describe the role of animations in enhancing user engagement and making the UI more interactive.
        - **Types of Animations:** Discuss specific animations used in the application, such as transitions between sections or loading indicators during resume analysis.

    - **User Interaction Elements:**

        - **Tooltips and Help Icons:** Explain the implementation of tooltips or help icons that provide users with additional context or guidance on using the application.
        - **Interactive Features:** Describe any interactive elements that allow users to explore different aspects of their resumes or receive tailored suggestions.

- **Accessibility Considerations:**

    - **Design for Inclusivity:**

        - **Color Contrast and Font Choices:** Discuss how color contrast and font selections were made to ensure readability for users with visual impairments.
        - **Keyboard Navigation:** Explain the implementation of keyboard navigation features to accommodate users who may not use a mouse
          .
    - **Mobile Responsiveness:**

        - **Responsive Design Principles:** Highlight how the UI adapts to different screen sizes and devices, ensuring usability on both desktops and mobile devices.
        -

- **User Testing and Feedback:**
    - **Testing Methodology:**
        - **User Testing Sessions:** Describe the user testing sessions conducted to gather feedback on the UI, including the demographics of participants.
        - **Feedback Collection Methods:** Explain how feedback was collected (e.g., surveys, interviews) and the types of questions asked.
- **Summary of User Interface Design:**
    - **Importance of UI in CareerCraft:** Summarize how a well-designed user interface enhances the overall user experience, making the resume analysis process more accessible and effective.
    - **Future UI Enhancements:** Briefly discuss any potential future enhancements or features that could be added to improve the UI further.

Chapter 8

Results and Evaluation

- **8.1 Performance Metrics:**
    - **Evaluation Criteria:**
        - **Accuracy:** Define how the accuracy of the Gemini model is measured during resume analysis. Discuss metrics such as precision, recall, and F1 score.
        - **User Satisfaction:** Explain how user satisfaction is evaluated through surveys or feedback forms, including specific questions related to the usefulness and clarity of the feedback provided.
    - **Results Overview:**
        - Present key metrics obtained from testing the Gemini model on various resumes. Include statistical data and comparisons to highlight performance, such as the average accuracy rate across different resume types.
- **User Testing Outcomes:**
    - **Testing Procedures:**
        - Describe the methodology used for user testing, including the selection of participants and the tasks they were asked to perform within the application.
        - Include both qualitative and quantitative feedback gathered during the testing phase
          .
    - **User Feedback:**
        - Analysis of User Responses: Summarize the common themes in user feedback regarding ease of use, effectiveness of recommendations, and overall satisfaction with the analysis results.
        - Improvement Suggestions: Highlight any specific suggestions made by users for improving the system or UI, focusing on areas that could enhance user experience.

- **Comparative Analysis with Existing Solutions:**

    - **Benchmarking Against Competitors:**
        - Identify other resume analysis tools or ATS optimization solutions and discuss how CareerCraft compares to them in terms of features, accuracy, and user experience.
        - Present comparative data, such as user satisfaction ratings or performance metrics, to illustrate where CareerCraft excels or has room for improvement.

    - **Case Studies:**
        - Provide case studies or examples of users who have successfully used CareerCraft to improve their resumes, detailing the changes made and the outcomes achieved (e.g., job interviews secured).

- **Challenges Faced During Evaluation:**

    - **Data Limitations:** Discuss any limitations encountered during the evaluation phase, such as a lack of diverse resumes or varying ATS configurations that might affect results.
    - **User Diversity:** Address challenges in capturing feedback from a diverse user base with different backgrounds, experiences, and job markets.

- **Future Evaluation Strategies:**

    - **Longitudinal Studies:** Propose conducting longitudinal studies to evaluate the long-term effectiveness of CareerCraft in helping users secure job interviews and employment.
    - **Continuous Feedback Loop:** Suggest implementing a continuous feedback mechanism to gather ongoing user insights and enhance the model iteratively.

- **Summary of Results and Evaluation:**

    - **Overall Effectiveness:** Summarize the overall effectiveness of CareerCraft in achieving its objectives of providing an ATS-optimized resume analysis tool.
    - **User Impact:** Briefly discuss the impact of the application on user success in the job application process, including any notable success stories or testimonials.

Chapter 9

Conclusion and Future Work

- **Summary of Key Findings:**
  - **Overall Impact of CareerCraft:**
    - Summarize the main outcomes of the project, emphasizing how CareerCraft successfully leverages the Gemini model to provide ATS-optimized resume analysis.
    - Highlight the key benefits for users, such as improved resume scores, tailored feedback, and increased chances of passing through ATS filters.
  - **Significance of the Gemini Model:**
    - Reflect on the importance of using the Gemini model in the context of resume analysis, particularly its ability to understand contextual nuances and provide actionable insights.
- **Lessons Learned:**
  - **Challenges Overcome:**
    - Discuss the challenges faced during the development and evaluation of the application and how they were addressed. Include lessons learned that could inform future projects.
  - **User Engagement Insights:**
    - Highlight any insights gained from user testing and feedback that are relevant to enhancing user engagement and experience in similar applications.
- **Recommendations for Future Work:**
  - **Feature Enhancements:**
    - Suggest specific features that could be added to CareerCraft in future iterations, such as:
      i. Integration of real-time job market data to tailor resume recommendations based on current trends.
      ii. Advanced analytics to track user progress over time and measure the effectiveness of implemented changes.

- **Expanding Model Capabilities:**
    - Recommend exploring further improvements to the Gemini model, including training on more diverse datasets to enhance its adaptability and accuracy across different industries and roles.

- **Broader Implications:**
    - **Impact on Job Seekers:**
        - Discuss the broader implications of the CareerCraft application on job seekers, emphasizing how enhanced resume optimization can lead to better job matching and reduced time spent in the job search process.
    - **Future of Recruitment Technologies:**
        - Reflect on the future landscape of recruitment technologies and how AI-driven solutions like CareerCraft can play a vital role in reshaping the hiring process for both candidates and employers.

- **Closing Thoughts:**
    - **Vision for CareerCraft:**
        - Conclude with a vision for the future of CareerCraft, emphasizing its potential as a valuable tool for job seekers in navigating an increasingly competitive job market.
    - **Call to Action:**
        - Encourage continued innovation in the field of resume analysis and recruitment technologies, advocating for the importance of combining AI with user-centric design to better serve the needs of job applicants.

Chapter 10

Implementation

10.1 Requirements:

requirements.txt

```
streamlit
streamlit_extras
google-generativeai
PyPDF2
python-dotenv
Pillow
matplotlib
```

10.2 Initialization of API Key:

.env

```
GEMINI_API_KEY=AIzaSyAo0_PImZNg_t9ROd4PkeY1tnNF96KaOyk
```

10.3 Loading Gemini Pro pretrained model and implementing a function to get a Gemini response:

```python
import streamlit as st
from streamlit_extras import add_vertical_space as avs
import google.generativeai as genai
import os
import PyPDF2 as pdf
from dotenv import load_dotenv
from PIL import Image
import matplotlib.pyplot as plt

load_dotenv()  # Load all our environment variables

genai.configure(api_key=os.getenv("AIzaSyAo0_PImZNg_t9ROd4PkeY1tnNF96KaOyk"))

def get_gemini_response(input):
    try:
        model = genai.GenerativeModel('gemini-pro')
        response = model.generate_content(input)
        return response.text
    except Exception as e:
        st.error(f"Error generating response: {e}")
        return None

# Convert PDF content to Text format
def input_pdf_text(uploaded_file):
    try:
        reader = pdf.PdfReader(uploaded_file)
        text = ""
        for page in range(len(reader.pages)):
            page = reader.pages[page]
            text += str(page.extract_text())
        return text
    except Exception as e:
        st.error(f"Error reading PDF file: {e}")
        return None
```

10.4 Implementing a function to read PDF content:

```python
# Convert PDF content to Text format
def input_pdf_text(uploaded_file):
    try:
        reader = pdf.PdfReader(uploaded_file)
        text = ""
        for page in range(len(reader.pages)):
            page = reader.pages[page]
            text += str(page.extract_text())
        return text
    except Exception as e:
        st.error(f"Error reading PDF file: {e}")
        return None
```

10.5 Implementing a function to represent data graphically:

```python
# Function to create a doughnut chart
def create_doughnut_chart(percentage):
    fig, ax = plt.subplots(figsize=(6, 6))
    sizes = [percentage, 100 - percentage]
    colors = ['#4CAF50', '#E0E0E0']
    explode = (0.1, 0)
    ax.pie(sizes, colors=colors, startangle=90, explode=explode, wedgeprops=dict(width=0.3))
    ax.text(0, 0, f'{percentage}%', ha='center', va='center', fontsize=24, fontweight='bold')
    ax.set_title("Match Percentage", fontsize=16)
    ax.axis('equal')
    return fig
```

10.6 Writing a prompt for Gemini Model:

```python
with col1:
    st.markdown("<h1 class='header-title'>Navigate Your Carrer Journey</h1>", unsafe_allow_html=True)
    jd = st.text_area("Enter the Job Description")
    uploaded_file = st.file_uploader("Upload Your Resume", type="pdf", help="Please upload the PDF")
    submit = st.button("Submit")
    if submit:
        if uploaded_file is not None and jd:
            text = input_pdf_text(uploaded_file)
            input_prompt = f"""
            As an experienced ATS (Applicant Tracking System), proficient in the technical domain encompassing Software Engineering, D
            resume: {text}
            description: {jd}
            I want the response in the following structure:
            The first line indicates the percentage match with the job description (JD).
            The second line presents a list of missing keywords.
            The third section provides a profile summary.
            Mention the title for all the three sections.
            While generating the response put some space to separate all the three sections.
            """
            response = get_gemini_response(input_prompt)
            if response:
                st.subheader("Analysis Result")
                left_col, right_col = st.columns([2, 1])
                with left_col:
                    st.markdown(response)
                match_percentage = 0
                try:
                    match_percentage = int(response.split('\n')[0].split(' ')[-1].strip('%'))
                except:
                    st.error("Failed to extract match percentage from the response.")

                with right_col:
                    fig = create_doughnut_chart(match_percentage)
                    st.pyplot(fig)
        else:
```

Chapter 11

Model Deployment

11.1 Integrate with web framework:

```
st.markdown(
    """
    <style>
    @import url('https://fonts.googleapis.com/css2?family=Roboto:wght@300;400;700&display=swap');

    .stApp {
        background-color:#ADD8E6;
        color: black;
        font-family: 'Roboto', sans-serif;
    }
    h1, h2, h3, h4, h5, h6 {
        color: black;
        font-family: 'Roboto', sans-serif;
        margin:20px;
    }
    p, div, span {
        color: black;
        font-family: 'Roboto', sans-serif;
    }
    .stImage {
        margin: auto;
        display: block;
        margin: 12px 12px;
        border-radius: 15px;

    }
    img[src="http://localhost:8516/media/33fd7a949eea48174eef7209b4f9b6445c7e2cc5c694ea7a6f14b5e7.jpg"]{
        position:absolute;
        left:25px;
        top:40px;
        width:100px;
    }
    img[src="C:\\Users\\hp\\Desktop\\Project\\image2.jpg"]{
        position:absolute;
        left:-20px;
```

```
}
img[src="C:\\Users\\hp\\Desktop\\Project\\image2.jpg"]{
    position:absolute;
    left:-20px;
}
img[src="http://localhost:8516/media/c2d373f3e6c34e1aec9ad8b4e52d5cc229c52ca03f6b7c65cbe4b8d2.jpg"]{
    position:absolute;
    right:-50px;
    width:100px;
    height:500px;
    margin-top:0px auto;

}
img[src="http://localhost:8501/media/21535ea99dc1fb6e337e6bbb7f629a85cb9cad70cf96ca8e8032fa7f.jpg"]{
    position:absolute;
    left:-30px;
    margin-top:60px;
}
div[style*="width:188.812px"]{
    font-size:1rem;
    font-weight:bold;

}
.st-emotion-cache-1b0udgb.e115fcil0{
    font-size:1.5rem;
    font-weight:900;
    color:black;
    transform:translateX(30px);
    transform.translateY(60px);
    margin-top:0px auto;
    position:absolute;
    bottom:-550px;
    right:-25px;

}
#navigate-the-job-market-with-confidence{
```

```
}
#navigate-the-job-market-with-confidence{
    margin-left:-5px;
}
div[data-testid="stImageContainer"]{
    margin-left:-30px;
}
video[ autoplay="loop="]{
    position:absolute;
    left:-30px;


}

.stButton>button {
    background-color:orange;
    color: #ffffff ;
    border: none;
    border-radius: 5px;
    padding: 10px 20px;
    font-size: 16px;
    cursor: pointer;
}
.stButton>button:hover {
    background-color: #004d00;
}
.header-title {
    text-align: center;
    font-weight: 700;
    font-size: 2.5em;
}
.sub-header {
    text-align: center;
    font-weight:900;
    font-size: 1.5em;
    margin-left:650px;
```

```
.sub-header {
    text-align: center;
    font-weight:900;
    font-size: 1.5em;
    margin-left:650px;
    position:relative;
    margin-top:-50px;

}
.description {
    text-align: justify;
    font-weight: 300;
    font-size: 1.2em;
}
.offerings {
    font-weight: 300;
    font-size: 1.2em;
    margin:20px;
}
.faq-container {
    background-color: white;
    border-radius: 0px;
    padding: 20px;
    box-shadow: 0 2px 5px rgba(0, 0, 0, 0.1);
    margin-left:650px;
    position:relative;
    margin-top:40px;
    border-bottom-right-radius:15%;
    box-shadow:0px 0px 8px navy;
}
.faq-question {
    font-weight: 400;
    font-size: 1.2em;
    margin-bottom:10px;
    position:relative;
```

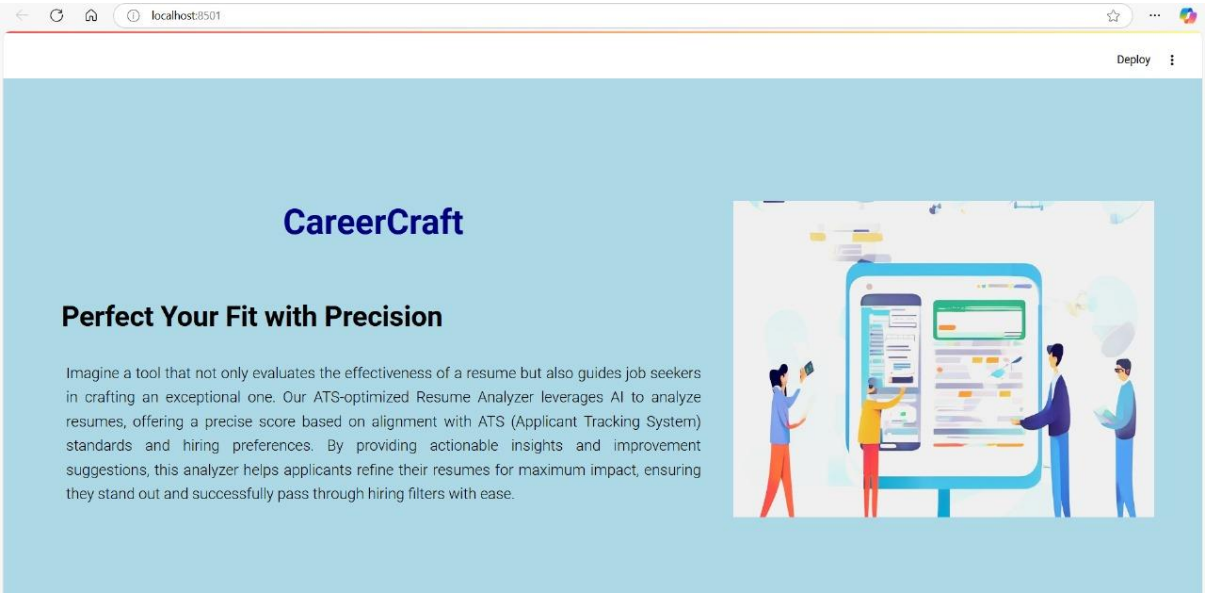
```
}
.faq-answer {
    font-weight: 300;
    font-size: 1.2em;
    margin-bottom: 30px;

}
.stTextInput > div, .stTextArea > div {
    background-color: #d4edda;  /* Light green background */
    border-radius: 5px;
    padding: 10px;
}
</style>
""",
unsafe_allow_html=True
)
```

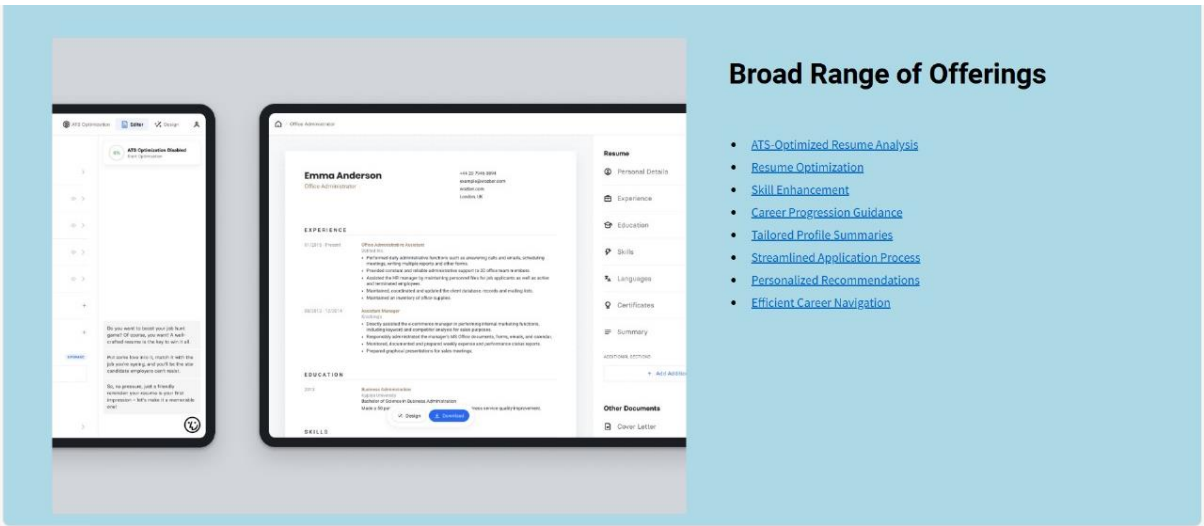
Note:

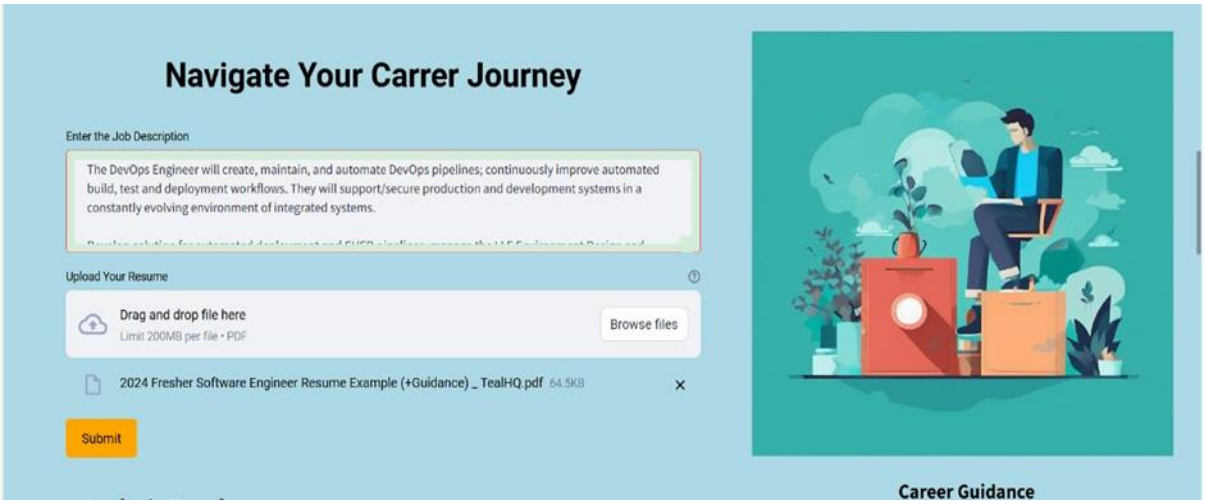
To host the application, go to the terminal, type **- streamlit run app.py**

Chapter 12

Output Screens





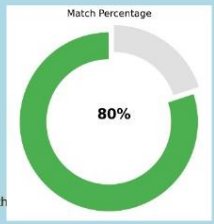


Analysis Result

JD Matching Percentage: 80%

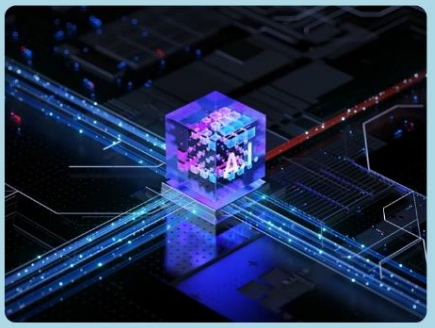
Missing Keywords:

- Native Mobile App Platform knowledge & experience – Backend API's supporting mobile apps
- Browserstack
- LambdaTest



Profile Summary:

Ryan Rodriguez is a highly adaptable and motivated software engineer with a keen eye for detail and a disciplined approach to coding and debugging. He possesses proven capabilities in cloud architecture and development, as well as experience in leading teams and implementing machine learning algorithms to improve data processing efficiency. His skills include Java development, RESTful API development, Agile/Scrum methodologies, CI/CD pipelines, and cloud technologies (AWS, Azure, GCP).



Advance Analysis

FAQs

Question: How does CareerCraft analyze resumes and job descriptions?

Answer: CareerCraft uses advanced algorithms to analyze resumes and job descriptions, identifying key keywords and assessing compatibility between the two.

Question: Is CareerCraft suitable for both entry-level and experienced professionals?

Answer: Absolutely! CareerCraft caters to job seekers at all career stages, offering tailored insights and guidance to enhance their resumes and advance their careers.

Question: Can CareerCraft suggest improvements for my resume?

Answer: Yes, CareerCraft provides personalized recommendations to optimize your resume for specific job openings, including suggestions for missing keywords and alignment with desired job roles.

Chapter 13

References

- **Academic References:**
  - **Research Papers:**
    - List academic papers and journal articles that discuss relevant concepts, technologies, or methodologies used in your project. This may include papers on:
      a. Natural Language Processing (NLP) and its applications in resume analysis.
      b. Studies on Applicant Tracking Systems (ATS) and their impact on recruitment.
      c. Research on machine learning models, specifically related to the Gemini model or similar architectures.

- **Example Format:**
  - Author(s). (Year). Title of the paper. *Journal Name*, Volume(Issue), Page Numbers. DOI/Publisher URL.

- **Online Resources and Documentation:**
  - **Official Documentation:**
    - Include images to the documentation for libraries, frameworks, or tools used in the development of CareerCraft, such as:
      1. Streamlit documentation.
      2. Documentation for the Gemini model (if available).
      3. Libraries for resume parsing (e.g., PyPDF2, python-docx).

Chapter 14

Appendix

- **Additional Data and Resources:**
    - **Sample Resumes:**
        - Resumes that were analysed during the development and testing of the CareerCraft application. Provide annotations or comments highlighting specific areas of strength and opportunities for improvement based on ATS optimization principles.
    - **Job Descriptions:**
        - Samples of job descriptions used to evaluate the effectiveness of the Gemini model in providing tailored resume feedback. This can demonstrate how the model aligns with industry requirements.

- **Detailed Technical Specifications:**
    - **System Architecture Diagrams:**
        - Include diagrams that illustrate the architecture of the CareerCraft application. This could encompass the interaction between the front-end (user interface), back-end (Gemini model), and any external libraries or services used (e.g., resume parsing tools).
    - **Code Snippets:**
        - Provided relevant code snippets or pseudocode that highlight key functionalities of the application. This can include sections on resume parsing, the analysis algorithm, or user interface components.

- **User Guides and Tutorials:**
    - **User Instructions:**
        - Include a user manual or step-by-step guide that explains how to navigate and use the CareerCraft application. This can enhance user experience and provide clarity on the functionalities available.
    - **Frequently Asked Questions (FAQs):**

    - Compiled a list of frequently asked questions and answers regarding the application, its use, and troubleshooting tips. This can help users quickly resolve common issues or uncertainties.

- **Feedback Forms and Survey Templates:**

  - **User Feedback Templates:**
    - Included copies of the feedback forms or survey templates used during user testing. This can provide insight into the evaluation process and help understand user sentiments regarding the application.

- **Performance Data and Analysis Results:**

  - **Statistical Analysis:**
    - Present additional statistics or performance data that support the findings discussed in the main body of the report. This can include charts, graphs, or tables illustrating key metrics related to user satisfaction or resume scores.

  - **Comparative Performance Charts:**
    - Include charts or tables that compare the performance of CareerCraft with other existing resume analysis tools or methods. This can visually depict where CareerCraft excels or identifies areas for improvement.

- **Acknowledgments:**

  - **Contributors and Mentors:**
    - Recognize individuals or organizations that contributed to the development of the CareerCraft application, including mentors, advisors, or collaborators.