INTERNSHIP PROJECT

REPORT TITLE

RESUME APPLICATION TRACKING SYSTEM

-REPORT BY

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Introduction

The AI-Powered Resume ATS (Applicant Tracking System) is an intelligent tool designed to streamline and enhance the recruitment process by leveraging generative AI and advanced data analysis. Built using Google's Gemini API and integrated with a user-friendly Streamlit interface, the system evaluates resumes against job descriptions with high accuracy. It provides key insights such as percentage match, missing keywords, and profile summaries, empowering candidates to optimize their resumes for competitive job markets. Additionally, the tool supports recruiters by offering bulk resume parsing, skill-gap analysis, and actionable insights, making hiring more efficient and data-driven.

This end-to-end solution caters to job seekers and employers, ensuring adaptability through features like customizable weightage for evaluation criteria, multilingual support, and industry-specific adjustments. With its subscription-based business model and freemium trial offerings, the system not only addresses immediate recruitment challenges but also provides scalable opportunities for long-term growth.

Business Need Assessment

1. Current Industry Challenges

1. **Inefficiency in Resume Screening**:
   Recruiters spend significant time manually screening resumes, leading to delays in the hiring process.
2. **Candidate Optimization Issues**:
   Many job seekers fail to tailor their resumes effectively to match job descriptions, resulting in missed opportunities.
3. **Skill Matching and Inclusion Gaps**:
   Companies struggle to identify candidates with the right skills and maintain inclusivity in hiring processes.

2. Target Market

1. **Job Seekers**:
   Graduates, professionals seeking career changes, and candidates applying to competitive roles.
2. **Employers and Recruiters**:
   Small-to-medium enterprises (SMEs), large organizations, and recruitment agencies looking for efficient candidate evaluation.
3. **Educational Institutions**:
   Universities and training centers offering resume-building support to students.

3. Why This Solution is Needed

1. **For Job Seekers**:
   - Provides actionable feedback on resume improvements.
   - Highlights missing keywords and generates role-specific summaries.
   - Improves job application success rates by aligning resumes with ATS expectations.
2. **For Recruiters**:
   - Automates resume parsing, reducing time spent on initial screening.

- Offers advanced analytics like skill-gap identification and diversity insights.
- Enhances hiring efficiency by providing a shortlist of top candidates based on role-specific criteria.

3. **For Businesses**:
   - Aligns recruitment with organizational goals by ensuring candidates meet technical and cultural fit.
   - Reduces hiring costs and time-to-hire through automation.

4. Key Features Addressing Business Needs

1. **Free-to-Paid Conversion Model**:
   Provides free trials to job seekers for resume analysis, converting them to paid users through value-add features.
2. **Bulk Resume Processing**:
   Enables recruiters to handle multiple resumes at once, saving time and effort.
3. **AI-Driven Insights**:
   Delivers unmatched accuracy and actionable recommendations through generative AI.
4. **Customizable Evaluation Metrics**:
   Allows recruiters to adjust scoring parameters based on job-specific priorities.

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5. Competitive Advantage

1. **AI-Powered Customization**: Tailors recommendations for different industries and roles.
2. **Multilingual Capability**: Expands usability for global markets.
3. **Ease of Integration**: API support for connecting with existing ATS platforms like Greenhouse and Workday.

6. Anticipated Business Impact

1. **For Job Seekers**:
   - Higher interview call rates due to optimized resumes.

- Better career guidance through actionable insights.

2. **For Employers**:
   - Reduced hiring cycle times by 30-40%.
   - Improved quality-of-hire metrics through skill matching.
3. **Financial Viability**:
   - Projected annual revenue based on conversion rates and subscription fees.
   - Scalability through employer-targeted API integration and bulk processing fees.

EXTERNAL SEARCH (INFORMATION SOURCES/REFERENCES):

1. Business Analyst job openings 2024 from linkedin

   Source: Kaggle

   Link:kaggle dataset link

2. Resume Dataset

   Source: Kaggle

   Link : Resume Dataset Link

3. DataSet Link (Kaggle): https://www.kaggle.com/code/jamiyat/hr-regression-model/input
4. Google gemini API

Applicable Patents

1. **Parsing and Analyzing Resumes**
   - Extracts structured data from unstructured resumes using NLP for precise job matching.
2. **Intelligent Recruitment System**

- Uses ML to rank resumes, identify missing skills, and enhance candidate evaluation.

3. **Keyword Extraction and Skill Matching**
   - Identifies critical skills/keywords in resumes and matches them with job descriptions.
4. **Automated Resume Ranking**
   - Automates ranking resumes by relevance using AI and data mining.
5. **Context-Aware Job Matching**
   - Leverages contextual understanding for accurate job-candidate alignment.

Applicable Regulations and Constraints

1. **Data Privacy Laws (e.g., GDPR, CCPA):**
   - Ensure compliance with data protection regulations when processing personal data from resumes.
2. **Equal Employment Opportunity (EEO):**
   - Avoid bias or discrimination in resume evaluation to comply with employment equality laws.
3. **Fair Automated Processing:**
   - Adhere to transparency requirements, explaining how the ATS evaluates and ranks candidates.
4. **Intellectual Property Rights:**
   - Avoid using patented methods or proprietary algorithms without appropriate licensing.
5. **Accuracy and Accountability:**
   - Ensure the ATS provides accurate recommendations and avoids errors that may unfairly impact candidates.
6. **Compliance with Local Employment Laws:**
   - Adapt to jurisdiction-specific labor laws and hiring practices (e.g., mandated disclosures or candidate rights).
7. **Ethical AI Guidelines:**

- Implement AI responsibly, ensuring fairness, explainability, and non-discrimination in outcomes.

Business Opportunities

1. **Talent Acquisition Efficiency:**
   - Streamline hiring processes for companies by automating resume screening, saving time and reducing costs.
2. **Improved Candidate Experience:**
   - Help job seekers tailor their resumes to specific job descriptions, increasing their chances of success.
3. **Custom Solutions for Businesses:**
   - Offer subscription-based ATS tools for HR teams to match candidates more accurately to job roles.
4. **Upskilling and Career Guidance:**
   - Provide insights on missing skills and personalized suggestions for job seekers to improve their profiles.
5. **Market Demand:**
   - Tap into the growing recruitment tech industry, especially for tech-focused roles in software, data science, and big data.
6. **Global Reach:**
   - Cater to both small businesses and large enterprises, adapting to global hiring trends and remote recruitment needs.

Concept Generation:

The AI Resume ATS aims to address inefficiencies, bias, and poor job-to-candidate matching in the recruitment process. By leveraging Generative AI, it automates resume parsing, skill

matching, and candidate ranking, providing a more efficient, unbiased, and accurate hiring system.

Concept Development:

Key features include:

- **AI-Powered Resume Parsing**: Extracts key details from resumes using advanced NLP and machine learning.
- **Job Matching Algorithms**: Compares resumes with job descriptions to rank candidates.
- **Bias Reduction**: Ensures unbiased candidate screening based solely on skills and qualifications.
- **Scalable, Cloud-Based Architecture**: Ensures flexibility and scalability to handle high volumes of resumes.
- **Subscription-Based SaaS**: A freemium model with a free trial to attract SMBs and large enterprises.
- **Continuous Model Improvement**: Uses feedback to refine the AI model and improve its accuracy over time.

Feasibility

The AI Resume ATS is highly feasible in the short term (2–3 years) due to the rapid advancements in AI and the availability of APIs like Gemini, which provide robust generative capabilities. Tools such as Streamlit and Python libraries simplify development, enabling quick prototyping and deployment. The increasing demand for automation in recruitment, driven by the need for efficiency and cost reduction, provides a strong foundation for market acceptance. With a growing emphasis on digitized hiring processes, the technical

infrastructure and market readiness make this project both achievable and impactful within a short timeframe.

Viability

The product has strong long-term viability (20–30 years), supported by the ongoing shift towards AI-driven hiring systems. As industries across sectors embrace automation, the need for intelligent, unbiased, and efficient recruitment tools will continue to grow. The tool's adaptability, through regular updates and feature enhancements, ensures it will stay aligned with evolving job market trends and technological advancements. Furthermore, as the global workforce diversifies and hiring practices become more data-driven, the ATS can cater to emerging challenges, solidifying its relevance over decades.

Monetization

The Resume ATS offers multiple monetization avenues that make it directly profitable:

1. **Subscription Plans:** Tiered pricing for recruiters and HR teams, offering basic and advanced features tailored to different business needs.
2. **Pay-Per-Use Model:** Affordable options for small businesses or individual job seekers to access the tool for one-off resume evaluations.
3. **Premium Features:** Personalized resume optimization, deep analytics, and integration with enterprise systems can be offered as paid add-ons.

Prototype Development:

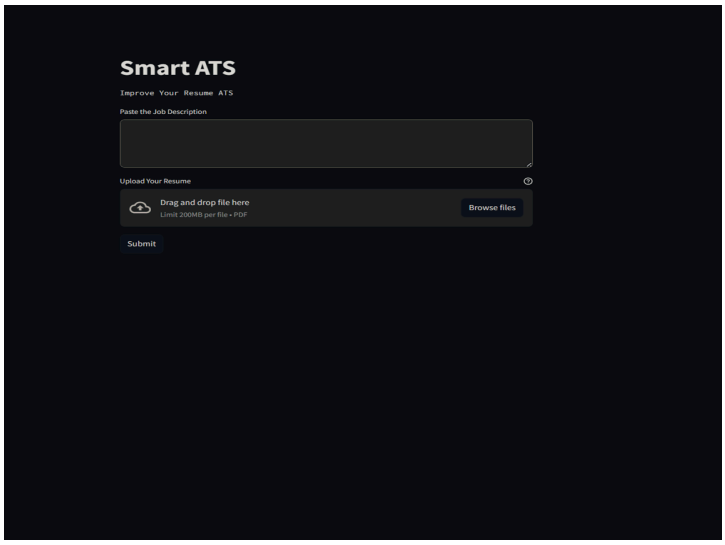
https://github.com/Jayzzz45/resumeparser.git

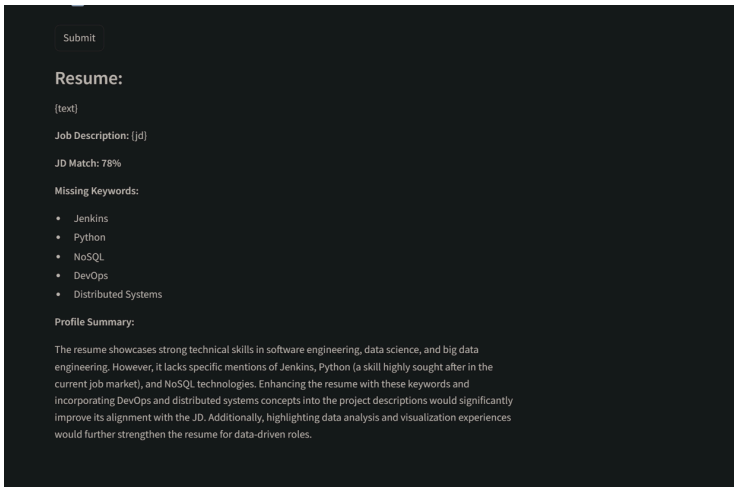
Prototype Workflow:

1. **Input Phase:**

- Users upload their resume as a PDF and paste the job description into a text box.

2. **Processing Phase:**
   - Resume content is extracted using the PyPDF2 library.
   - AI processes the resume and JD with a predefined prompt for analysis.
3. **Output Phase:**
   - The AI returns:
     - JD Match Percentage.
     - Missing Keywords.
     - Profile Summary with actionable recommendations.
4. **Interactive Interface:**
   - Streamlit provides a dynamic and user-friendly interface for immediate feedback.





output

Business Modeling:

Subscription-Based Business Model (SaaS)

Overview:

A subscription model allows users to pay a recurring fee (monthly/annually) for access to the AI-powered Resume ATS. Different pricing tiers can cater to varying needs.

Key Features:

- **Tiered Pricing**:
    - **Basic Plan**: For small businesses with limited job postings and applicants.
    - **Pro Plan**: For mid-sized companies with additional features like analytics and integrations.
    - **Enterprise Plan**: For large organizations with unlimited usage and customizations.
- **Scalability**: Easily add new features or adjust pricing as the system evolves.
- **Predictable Revenue**: Ensures steady cash flow due to recurring payments.

Example Pricing:

Tier	Monthly Fee	Features
Basic	$49	Parse 500 resumes/month, basic analytics.
Pro	$199	Parse 2,000 resumes/month, advanced analytics.
Enterprise	$999	Unlimited resumes, API access, custom insights.

Profit Potential (Mid-Term):

- Profitability achieved by scaling subscriptions across multiple small-to-medium businesses (SMBs).
- Cross-sell opportunities with add-ons (e.g., diversity hiring reports).

***ALSO,**

Free Trial Option

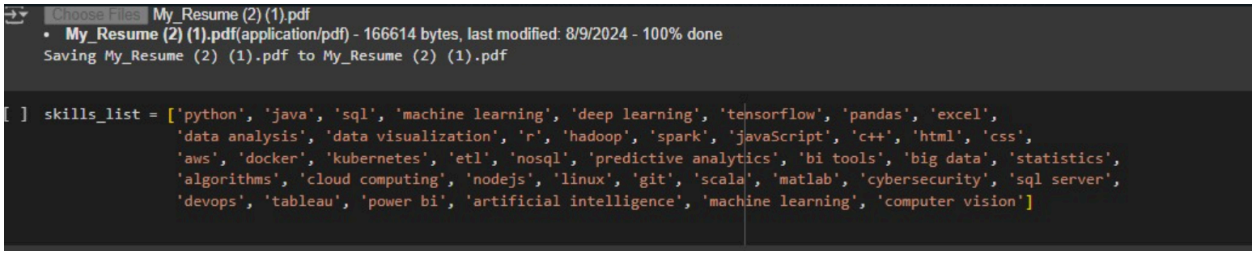
- Offer a **14-day free trial** for all tiers (Basic).
- Features:

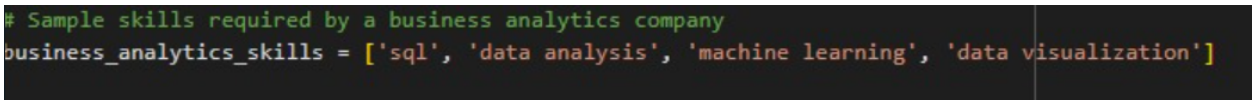
- Limited to parsing up to 50 resumes.
- Access to basic analytics (e.g., parsing accuracy, candidate ranking).

Financial Modelling (equation) with Machine Learning & Data Analysis

ML MODEL LINK:

https://colab.research.google.com/drive/18szY7YZBbwXlbUZTZj_TQxyU-XDWeYE5?usp=sharing



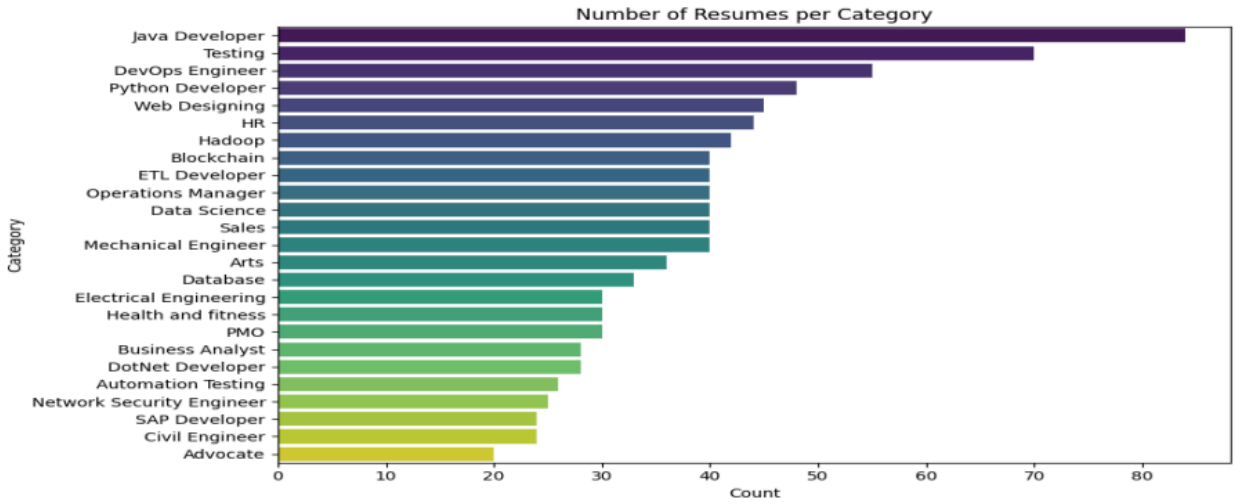


Output of model:

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
Skills found in the resume:
Python: 2 occurrence(s)
Sql: 2 occurrence(s)
Machine learning: 1 occurrence(s)
Data analysis: 2 occurrence(s)
Data visualization: 2 occurrence(s)
Excel: 3 occurrence(s)
Powerbi: 4 occurrence(s)

Matched skills with Business Analytics company (Total: 4):
sql, data analysis, machine learning, data visualization
```

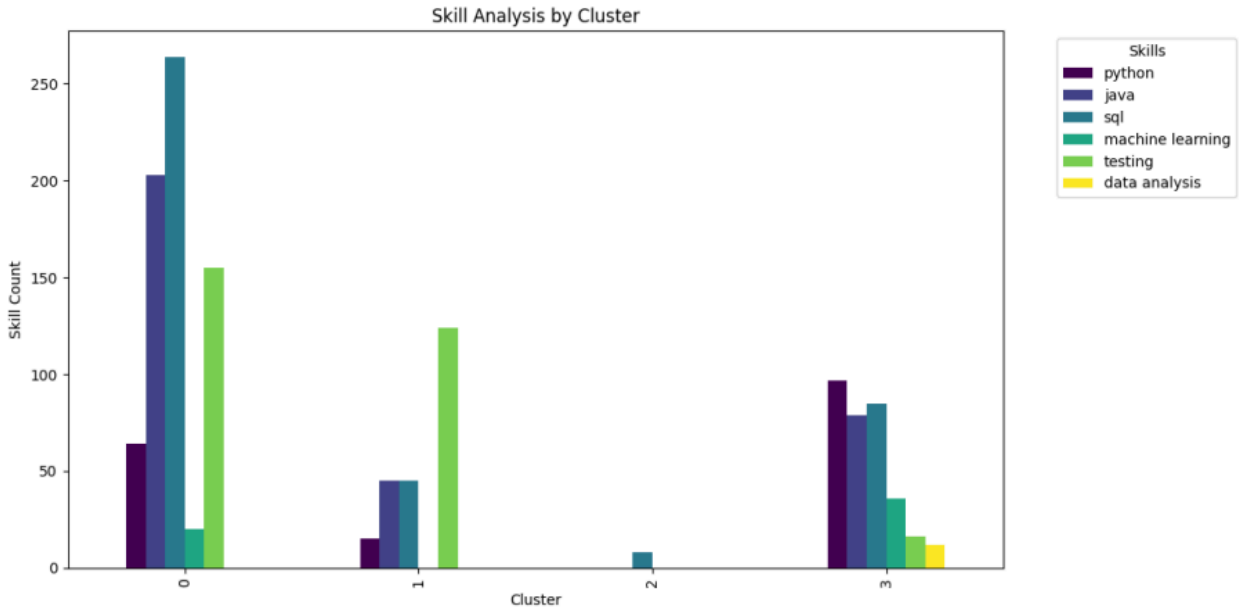
ANALYSIS:



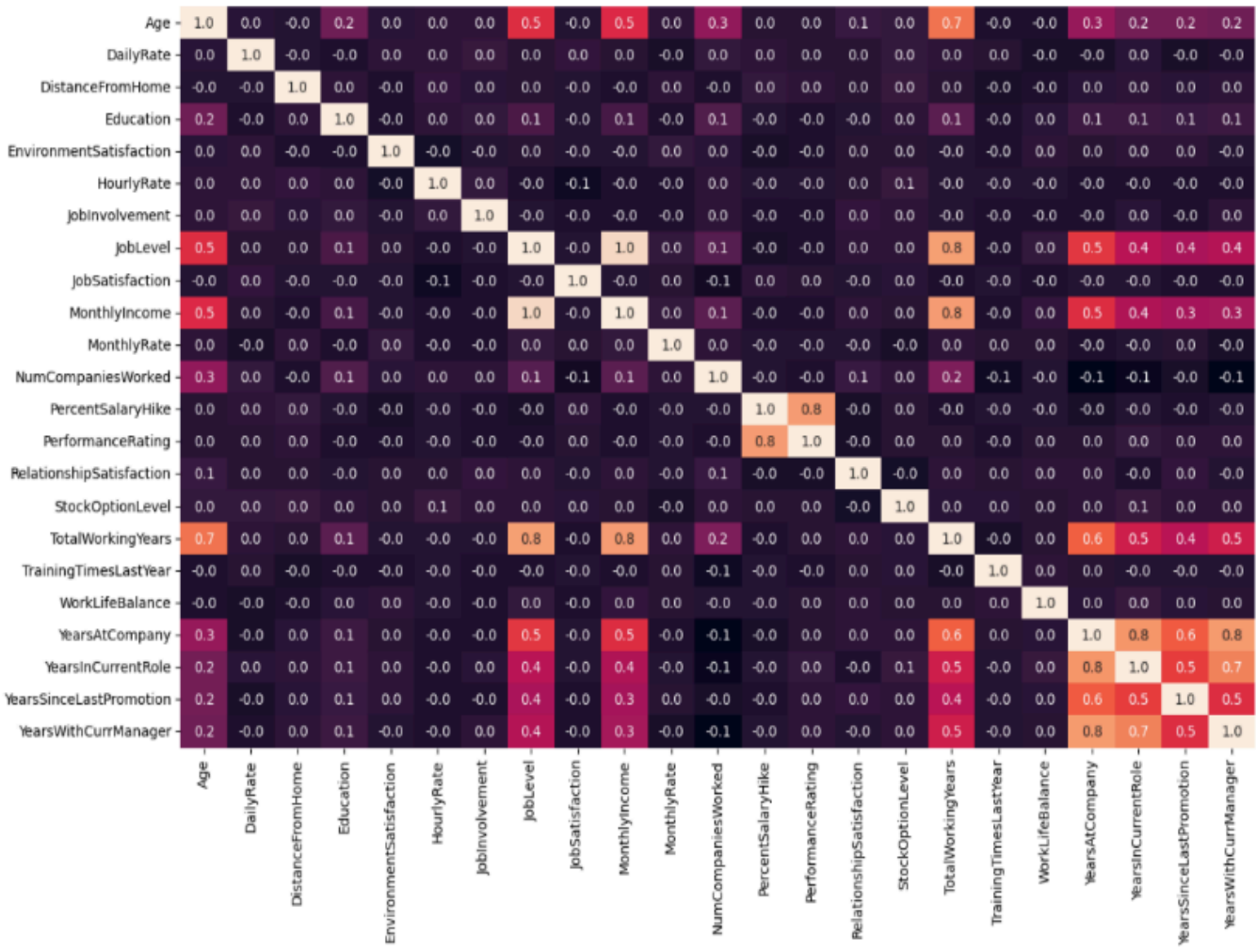
- **Figure Description: Bar plot displaying the number of resumes for each category.**
- **Purpose: Understand the distribution of resumes across categories.**

- **Insight: Highlights which categories have the most or least resumes, helping identify focus areas.**

- **Figure Description: WordCloud representing frequent terms in each cluster.**
- **Purpose: Highlight important keywords and skills for each cluster.**
- **Insight: Reveals focus areas of expertise represented by resumes in each cluster.**



- **Figure Description: Bar plot showing the count of key skills in each cluster.**
- **Purpose: Identify the skill distribution across clusters.**
- **Insight: Provides a detailed view of skill prevalence in different clusters, helping align clusters with desired competencies.**



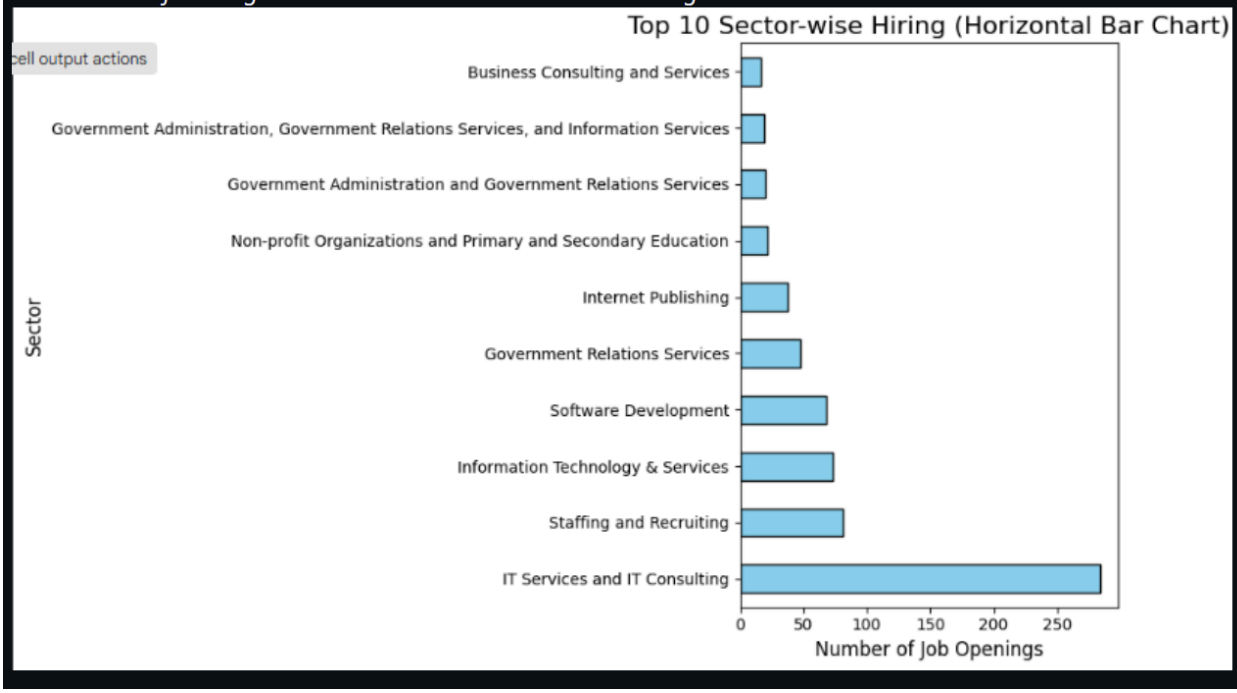
- **Heatmap Overview: The image is a heatmap showing the correlation matrix of various employee-related features.**
- **Correlation Coefficients: Each cell in the heatmap represents the correlation coefficient between two features, ranging from -1 to 1.**
- **Color Intensity: The color intensity indicates the strength of the correlation. Darker colors represent weaker correlations, and lighter colors represent stronger correlations.**
- **Diagonal Cells: The diagonal cells all have a value of 1.0, indicating that each feature is perfectly correlated with itself.**

- **<u>Strong Positive Correlations:</u>**
    - **TotalWorkingYears and MonthlyIncome have a strong positive correlation of 0.8.**
    - **YearsAtCompany and YearsInCurrentRole have a strong positive correlation of 0.8.**
    - **YearsAtCompany and YearsWithCurrManager have a strong positive correlation of 0.7.**
    - **·Age and TotalWorkingYears have a strong positive correlation of 0.7.**

- **Negative Correlations: The heatmap also shows some negative correlations, although they are generally weaker.**

7.Top 10 Sector wise Hiring

we can see major hiring is in branch of IT service and IT consulting sectors.

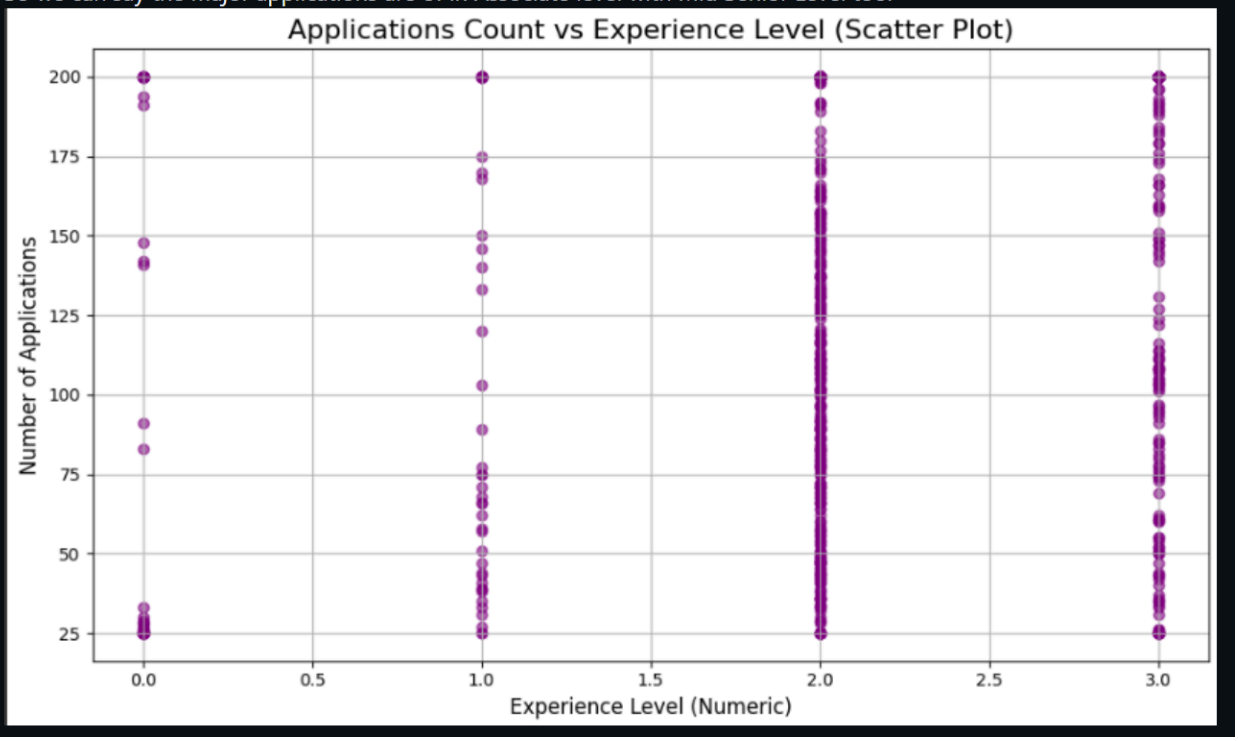


8. Applications count v/s Experience Level

here The plot is of :

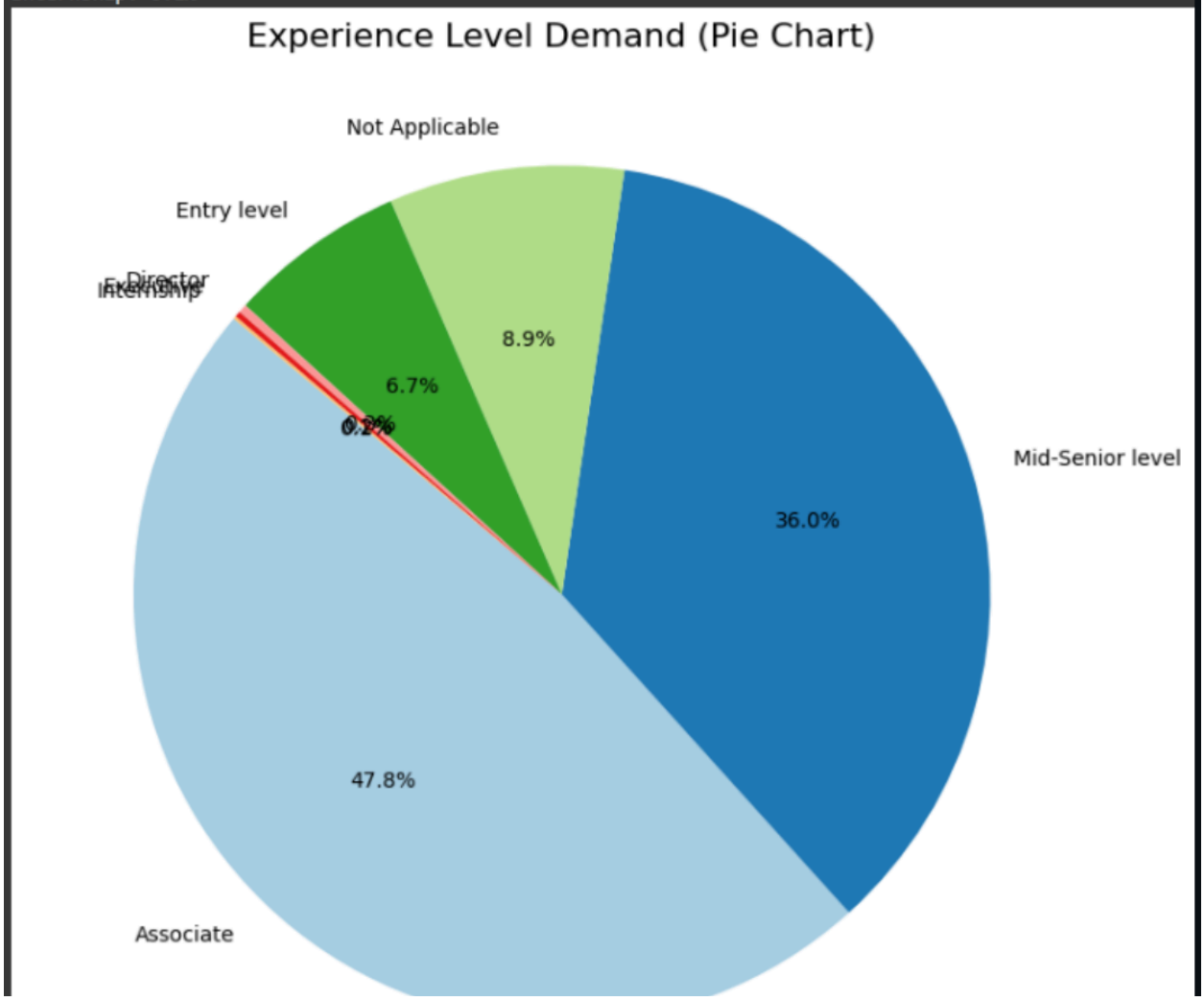
'Not Applicable': 0, 'Entry level': 1, 'Associate': 2, 'Mid-Senior level': 3, 'Senior': 4

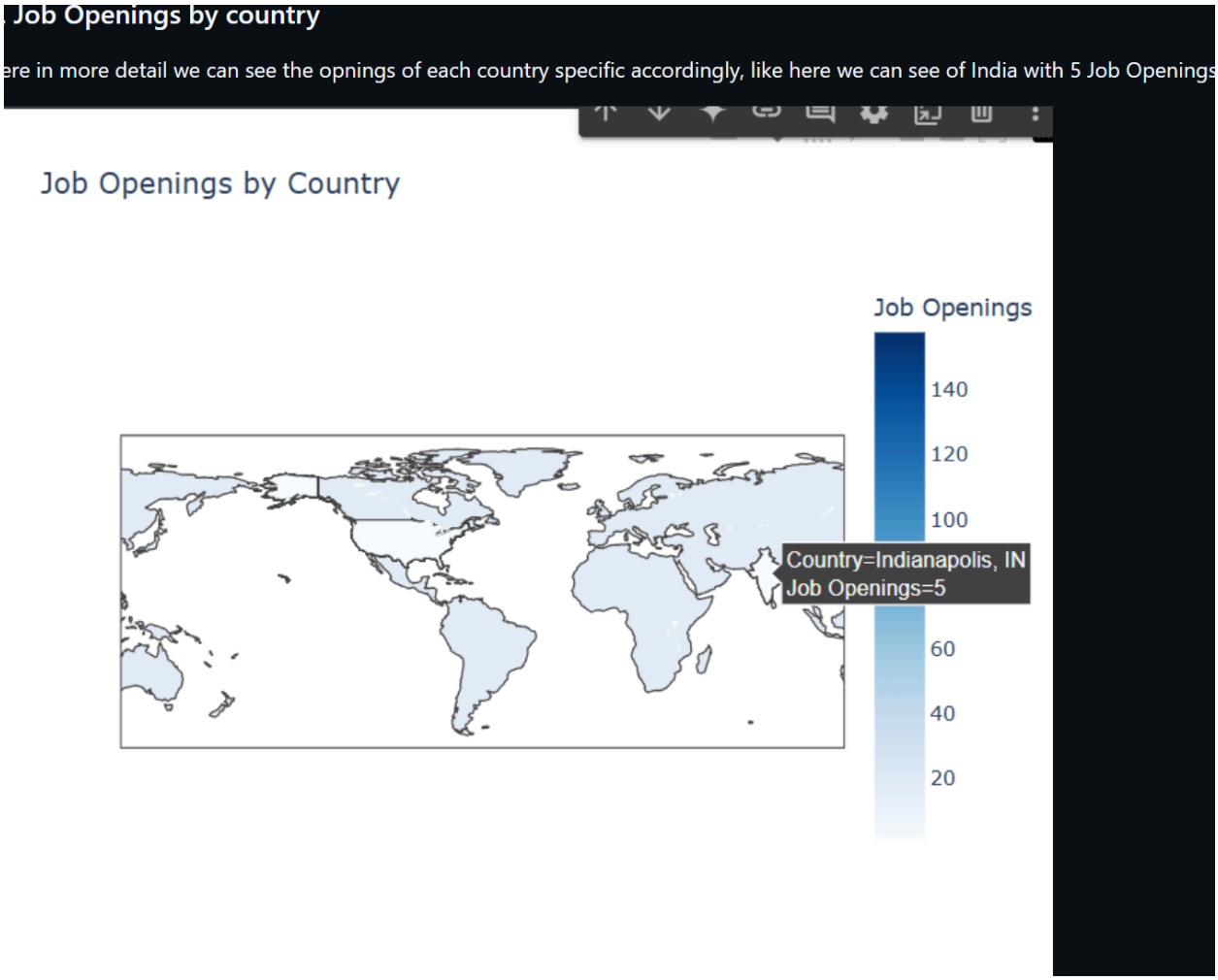
So we can say the major applications are of in Associate level with Mid Senior Level too.



4. Experince level Demand by companies:

```
Experience Level Demand (%):
Associate: 47.8%
Mid-Senior level: 36.0%
Not Applicable: 8.9%
Entry level: 6.7%
Director: 0.3%
Executive: 0.2%
Internship: 0.1%
```





Key Findings:

- **Demand for Business Analysts is strong across various industries and sectors, with a high demand for positions at the Associate and Mid-Senior levels.**
- **Companies with the highest job openings are focused on full-time or contract positions, especially in sectors like IT Services and IT Consulting.**

- **The global demand for business analysts is expanding, with notable job openings not just in the U.S. but also in countries like India.**
- **The application intensity suggests a competitive job market, with the majority of applicants concentrated around 200 applicants per job posting.**

Financial Equation:

Financial Equation for Subscription-Based Business Model

Revenue Equation:

Total Revenue=Subscriber Revenue+Pay-Per-Use Revenue

Subscriber Revenue:

Subscriber Revenue=(Free-to-Paid Conversion Rate×Trial Users×Average Subscription Fee)×12

- **Free-to-Paid Conversion Rate**: Percentage of free trial users who convert to paid subscribers.
- **Trial Users**: Total number of free trial users.
- **Average Subscription Fee**: Weighted average based on subscriptions to different tiers.
- Multiplying by 12 accounts for annual revenue.

Pay-Per-Use Revenue:

Pay-Per-Use Revenue=Number of Pay-Per-Use Transactions×Average Transaction Fee

Total Revenue Example Calculation:

Assume:

Trial Users: 1,000 per month.

Free-to-Paid Conversion Rate: 15% (150 conversions/month).

Average Subscription Fee (INR):

- Adjusted pricing to Indian market affordability:
    - Basic Plan: ₹2,000/month.
    - Pro Plan: ₹8,000/month.
    - Enterprise Plan: ₹40,000/month.
- Weighted **average subscription fee**: ₹8,000/month (considering most subscribers choose Pro Plan).

Pay-Per-Use Transactions: 5,000/month.

Average Transaction Fee: ₹8/resume processed

Subscriber Revenue

Subscriber Revenue=(Free-to-Paid Conversion Rate×Trial Users×Average Subscription Fee)×12

Substitute the values:

Subscriber Revenue=(0.15×1,000×8,000)×12
Subscriber Revenue=(120,000)×12=14,40,000INR/year

Pay-Per-Use Revenue

Pay-Per-Use Revenue=Number of Transactions×Average Transaction Fee×12

Substitute the values:

Pay-Per-Use Revenue=5,000×8×12

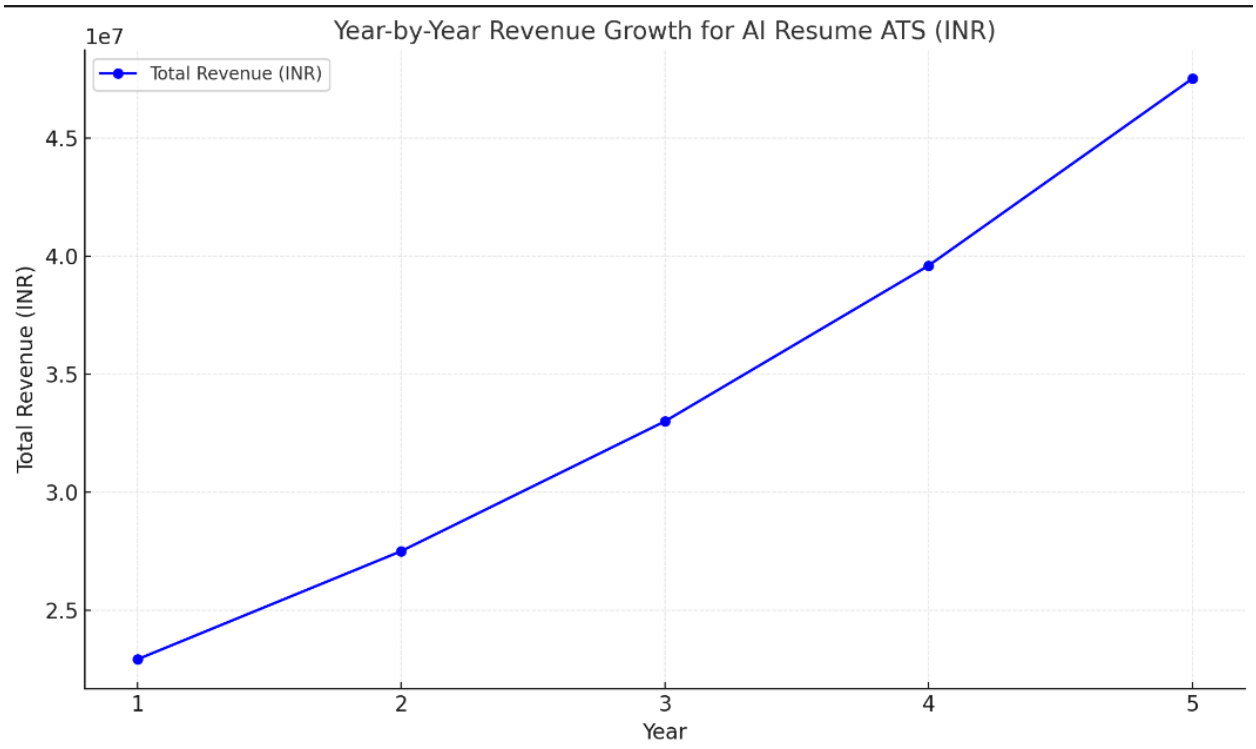
Pay-Per-Use Revenue=4,80,000 INR/year

Total Revenue:

Total Revenue=Subscriber Revenue+Pay-Per-Use Revenue

Substitute the values:

Total Revenue=14,40,000+4,80,000=19,20,000 INR/year



ASSUME:

Revenue Growth (Year-by-Year)

Assuming a **20% growth rate per year**, the revenue over 5 years is as follows:

1. **Year 1**: ₹22,908,000

2. **Year 2**: ₹27,489,600
3. **Year 3**: ₹32,987,520
4. **Year 4**: ₹39,585,024
5. **Year 5**: ₹47,502,029

CONCLUSION:

The AI Resume ATS platform is a promising and scalable solution that leverages AI to streamline the hiring process for businesses of all sizes. With a well-structured subscription-based business model, featuring a free trial to attract users, the platform is poised for growth. The projected revenue, supported by a 20% annual growth rate, demonstrates its potential for long-term profitability. By providing both subscription and pay-per-use options, the model ensures flexibility and scalability to meet the evolving needs of businesses. As a cost-effective, AI-powered tool, it is set to transform recruitment, offering significant value in terms of efficiency and accuracy.

Github Links:

Jayesh Sanap: https://github.com/Jayzzz45/resumeparser.git

Ayushi Soni: https://github.com/ayushisoni-28

Aryan Kakran : https://github.com/akakran22

Aman Datta: https://github.com/Aman-Datta23/Feynn-Labs/tree/main

Ramakrushna: https://github.com/RamakrushnaDas/Resume_Market_analysis.git