**AI-powered Resume Screening and Ranking System (P1)**

### Chapter 1: Introduction

#### 1.1 Background

Artificial Intelligence (AI) has revolutionized multiple sectors by automating repetitive tasks and offering intelligent solutions. One of the significant applications is the automation of resume screening and ranking, which significantly enhances the recruitment process. Organizations often face challenges in managing large volumes of resumes, leading to inefficiencies and the potential oversight of qualified candidates. AI-powered systems address these challenges by ensuring accurate, unbiased, and efficient evaluation of resumes.

#### 1.2 Objective

The primary goal of this project is to develop an AI-powered Resume Screening and Ranking System that:

* Automates the screening process by analyzing resumes.
* Ranks candidates based on predefined criteria such as skills, experience, and education.
* Reduces human bias and expedites the recruitment process.

#### 1.3 Scope

This system is designed for organizations of all sizes looking to optimize their hiring processes. The system integrates Natural Language Processing (NLP) and Machine Learning (ML) techniques to analyze unstructured resume data. The scope includes:

* Resume parsing and data extraction.
* Skill matching and scoring.
* Candidate ranking and report generation.

### Chapter 2: System Analysis

#### 2.1 Existing System

Manual resume screening is labor-intensive, prone to errors, and often subject to human biases. Existing tools like Applicant Tracking Systems (ATS) have limitations in handling diverse resume formats and evaluating qualitative factors that are essential in assessing candidates.

#### 2.2 Proposed System

The proposed AI-powered system improves the capabilities of traditional ATS by incorporating advanced NLP and ML algorithms. The system offers:

* Automated parsing of resumes in various formats.
* Dynamic ranking of candidates based on tailored criteria.
* Improved accuracy in matching job descriptions with candidate profiles.

### Chapter 3: System Design

#### 3.1 Architecture

##### 3.1.1 Components

* **Data Collection**: Input resumes in various formats (PDF, DOC, etc.).
* **NLP Module**: Extracts and processes essential information such as name, contact details, skills, and work experience.
* **Scoring Module**: Utilizes ML models to rank candidates based on job requirements.
* **Output Module**: Generates ranked lists and detailed reports.

##### 3.1.2 Workflow

1. Upload resumes.
2. Parse and extract data.
3. Match profiles with job criteria.
4. Rank candidates.
5. Display results.

### Chapter 4: Implementation

#### 4.1 Technologies Used

* **Programming Languages**: Python
* **Libraries**: Pandas, NumPy, NLTK, TensorFlow
* **Database**: SQL

#### 4.2 Modules

##### 4.2.1 Resume Parsing

This module utilizes NLP techniques to extract structured data from unstructured resume content, including skills, education, and work history.

##### 4.2.2 Scoring Algorithm

This module uses supervised learning models to assign scores based on:

* Skill relevance
* Experience level
* Educational qualifications

### Chapter 5: Testing

#### 5.1 Test Cases

| **Test Case ID** | **Description** | **Expected Result** | **Status** |
| --- | --- | --- | --- |
| TC01 | Upload invalid file format | Error message displayed | Pass |
| TC02 | Upload valid resume | Resume successfully processed | Pass |

### Chapter 6: Conclusion

The AI-powered Resume Screening and Ranking System effectively addresses challenges in traditional recruitment by automating the evaluation process and reducing human biases. By integrating this system into hiring workflows, organizations can reduce time-to-hire and improve the quality of shortlisted candidates.