

Contract Analysis and Risk Assessment Bot

Project Description

Introduction

Legal contracts play a crucial role in professional and business relationships. They define the rights, responsibilities, and obligations of the parties involved. However, most contracts are written in complex legal language, making them difficult for common users to understand. Many individuals, freelancers, and small business owners sign agreements without fully understanding the potential risks hidden in certain clauses. This can lead to financial loss, unfair termination, or legal disputes.

The **Contract Analysis and Risk Assessment Bot** is designed to address this problem by providing an automated and user-friendly solution for analyzing contracts and identifying risky clauses. The application helps users gain insights into the contract without requiring legal expertise.

Problem Statement

Understanding legal contracts is challenging due to:

- Complex and lengthy legal terminology
- Hidden clauses that may pose financial or legal risks
- Lack of access to professional legal advice for small users
- Time-consuming manual contract review

Most users do not have the knowledge or resources to analyze contracts thoroughly. As a result, they may unknowingly agree to unfavorable terms. There is a need for a simple, automated system that can assist users in identifying risky clauses and understanding their implications.

Proposed Solution

The **Contract Analysis and Risk Assessment Bot** provides an intelligent solution to this problem by using Natural Language Processing (NLP) techniques. The application allows users to upload contract documents in commonly used formats such as PDF, DOCX, or TXT. Once uploaded, the system extracts the text, breaks it into individual clauses, and evaluates each clause based on predefined risk rules.

The bot categorizes clauses into **High Risk**, **Medium Risk**, and **Low Risk**, and provides clear explanations for each classification. Additionally, it calculates an overall **risk percentage** for the entire contract and generates a downloadable report for future reference.

System Overview

The system consists of the following main components:

1. File Upload Module

Users can upload contract documents in PDF, DOCX, or TXT formats. The application extracts readable text using appropriate libraries.

2. Text Processing and Clause Splitting

The extracted text is divided into smaller clauses or sentences. This makes it easier to analyze individual contract terms.

3. Risk Detection Engine

Each clause is analyzed using predefined risk rules. Keywords and patterns related to termination, penalties, unilateral decisions, and liabilities are identified.

4. Risk Classification

Clauses are classified into:

- **High Risk** – clauses with serious legal or financial implications
- **Medium Risk** – clauses with moderate concern
- **Low Risk** – clauses with minimal risk

5. Risk Scoring and Percentage Calculation

Each risk level is assigned a weight, and an overall risk percentage is calculated for the contract.

6. Report Generation

A detailed PDF report is generated, summarizing the identified risks and the overall contract risk level.

Technologies Used

- **Python** – Core programming language
 - **Streamlit** – Web interface and application framework
 - **spaCy** – Natural Language Processing
 - **pdfplumber** – PDF text extraction
 - **python-docx** – DOCX file reading
 - **reportlab** – PDF report generation
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How the System Solves the Problem

This project simplifies contract analysis by:

- Automating the contract review process
- Highlighting risky clauses clearly
- Providing simple explanations instead of legal jargon
- Saving time and effort for users
- Offering a downloadable report for documentation

Users can quickly understand whether a contract is safe or risky without professional legal knowledge.

Use Cases

The Contract Analysis and Risk Assessment Bot can be used by:

- Students learning legal and NLP concepts
 - Freelancers reviewing client agreements
 - Small business owners analyzing vendor contracts
 - Beginners exploring AI and NLP applications
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Advantages of the System

- Easy-to-use interface
 - Supports multiple file formats
 - Provides clear and understandable results
 - Reduces dependency on manual contract review
 - Works on both desktop and mobile browsers
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Limitations

- Rule-based risk detection may not cover all legal scenarios
 - Does not replace professional legal advice
 - Accuracy depends on the quality of extracted text
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Future Enhancements

- AI-based risk prediction using machine learning
 - Highlighting risky keywords within clauses
 - Support for multiple languages
 - Improved UI and visualization
 - Cloud-based deployment with user authentication
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Conclusion

The **Contract Analysis and Risk Assessment Bot** is a practical and efficient solution for understanding legal contracts. By combining NLP techniques with a user-friendly web interface, the system helps

users identify potential risks, understand contract clauses, and make informed decisions. This project demonstrates the effective use of AI and NLP in solving real-world problems and provides a strong foundation for further enhancements.