**Abstract**

This project aims to enhance clinical decision support systems and improve prescription analysis by leveraging Natural Language Processing (NLP) techniques. The objective is to extract meaningful information from medical prescriptions using NLP algorithms and develop text classification models to differentiate between medical and non-medical prescriptions. By implementing these models, healthcare professionals can make more accurate diagnoses and treatment decisions.

The project scope involves utilizing research papers on Clinical Decision Support and Text Classification of medical and non-medical prescriptions as foundational knowledge. It includes data analysis, NLP algorithm implementation, and model development. However, system deployment and extensive clinical trials are excluded.

The project's deliverables consist of a comprehensive analysis of the research papers and a literature review on NLP techniques in clinical decision support and text classification. Additionally, developed NLP algorithms for extracting relevant information from medical prescriptions and trained text classification models will be provided. An evaluation report will compare the models' performance and assess their effectiveness using appropriate metrics.

This project has the potential to significantly improve clinical decision-making by utilizing NLP for prescription analysis. By enhancing the accuracy and efficiency of the decision support process, it can ultimately contribute to better patient outcomes and more informed healthcare decisions.

**Background:**

(Literature Review)

**Aim and Objectives:**

The major aim of this is to leverage Natural Language Processing (NLP) techniques to enhance clinical decision support systems and develop text classification models for the analysis of medical and non-medical prescriptions. The aim is to address the practical problem of improving the accuracy and efficiency of clinical decision-making processes through the application of NLP algorithms.

To achieve this aim, the following specific and measurable objectives will be pursued:

**Objective 1:** Apply NLP techniques to extract meaningful information from medical prescriptions.

**Sub-objective 1.1:** Identify and implement appropriate NLP algorithms for extracting relevant information from medical prescriptions.

**Sub-objective 1.2:** Preprocess and clean the prescription data to optimize NLP analysis.

**Objective 2:** Develop a clinical decision support system using NLP algorithms to assist healthcare professionals in making accurate diagnoses and treatment decisions.

**Sub-objective 2.1:** Design and implement a user-friendly interface for healthcare professionals to input medical prescriptions.

**Sub-objective 2.2:** Integrate the developed NLP algorithms into the decision support system for real-time analysis.

**Objective 3:** Build text classification models to distinguish between medical and non-medical prescriptions.

**Sub-objective 3.1:** Collect and curate a suitable dataset of medical and non-medical prescriptions.

**Sub-objective 3.2:** Train and optimize text classification models using appropriate machine learning techniques.

**Objective 4:** Evaluate the performance of the developed models and assess their effectiveness in improving prescription analysis.

**Sub-objective 4.1:** Define appropriate evaluation metrics, such as accuracy, precision, recall, and F1-score.

**Sub-objective 4.2:** Conduct extensive experiments and analyze the performance of the models against the defined metrics.

By accomplishing these objectives, this will contribute to the advancement of clinical decision support systems by demonstrating the effectiveness of NLP techniques in prescription analysis and classification.