**Abstract**

This project aims to advance clinical decision support systems and enhance medical prescription analysis using Natural Language Processing (NLP) techniques. The objective is to extract valuable information from medical prescriptions through NLP algorithms and establish models for the classification of the said prescriptions. With the implementation of these models, healthcare professionals can make more accurate diagnoses and treatment decisions.

The project scope includes leveraging research papers on Clinical Decision Support and Text Classification of medical prescriptions to provide the necessary foundational knowledge. This involves data analysis, the implementation of NLP algorithms, and model development. However, the project does not cover system deployment and extensive clinical trials.

The deliverables of the project comprise a comprehensive analysis of the research papers, as well as a literature review on the application of NLP techniques in clinical decision support. Additionally, the project will offer developed NLP algorithms for extracting pertinent information from medical prescriptions and the resulting trained models for prescription classification. An evaluation report will be provided, comparing the models' performance and gauging their efficacy using suitable metrics.

This project holds the potential to markedly improve clinical decision-making through the application of NLP in medical prescription analysis. By bolstering the accuracy and efficiency of the decision support process, it can ultimately lead 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.