CS-19411 PYTHON PROGRAMMING FOR MACHINE LEARNING

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## REPORT ON PPML PROJECT

Heart Disease Prediction Using Machine Learning

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## Abstract

The **Heart Disease Prediction Using Machine Learning** project aims to develop a predictive model to identify the likelihood of heart disease in patients based on their medical history and physiological parameters, such as age, cholesterol levels, blood pressure, and heart rate. Leveraging the **UCI Heart Disease dataset**, this project explores various machine learning algorithms, including **Logistic Regression** and **Random Forest**, to build a reliable classifier.

Data preprocessing techniques were applied to ensure data quality, such as feature scaling and handling missing values. The **Random Forest model** was selected for its higher accuracy and ability to handle complex non-linear relationships, while **Logistic Regression** served as a baseline due to its simplicity and interpretability. Both models were trained and evaluated using standard metrics like **accuracy**, the **confusion matrix**, and a **classification report**, with Random Forest outperforming Logistic Regression. Additionally, **feature importance analysis** provided insights into the most influential factors in predicting heart disease.

This project demonstrates the practical application of machine learning in healthcare, offering a tool to assist in early detection and potentially reduce the risk of severe outcomes. Through this process, we gained a deeper understanding of key machine learning concepts, such as **model evaluation**, **feature selection**, and the trade-off between model complexity and interpretability.

I’m including the live demonstration of my project in the following pages!

The code and the CSV File for this project is available on my GitHub repository at:

https://github.com/220901032janarthananm/220901032\_PPML-PROJECT\_Heart-Disease-Prediction

