PROJECT PROPOSAL

PROJECT TITLE

Cardiovascular Disease Prediction using Predictive Analytics

PROJECT OVERVIEW

This project aims to develop a machine-learning model for predicting cardiovascular disease risk. The model will provide insights to help healthcare professionals identify high-risk individuals early by analyzing patient health data. This will enable preventive measures, improved patient care, and better resource allocation in healthcare settings

OBJECTIVES

- Predict Cardiovascular Disease Risk – Develop a classification model based on health metrics to determine whether a patient is at risk.
- Identify Key Risk Factors – Analyze relationships between features such as age, cholesterol, blood pressure, and lifestyle habits.
- Improve Preventive Care – Provide healthcare providers with actionable insights to recommend lifestyle or medical interventions.
- Optimize Clinical Decision-Making – Support medical professionals in prioritizing high-risk patients for further tests and treatment.

SCOPE

Dataset

- The Cardiovascular Disease Dataset contains 70,000 patient records with 11 features, including:
  - Age, gender, blood pressure, cholesterol, smoking habits, and glucose levels.
- The model will use these features to classify patients as at risk or not at risk for cardiovascular disease.

Data Processing & Analysis

- Perform exploratory data analysis (EDA) to identify trends and correlations.
- Handle missing values, remove outliers, and normalize features for machine learning compatibility.
- Apply feature engineering techniques to enhance model performance.

Model Development

- Train classification models.
- Use evaluation metrics such as accuracy, precision, recall, and F1-score, to assess performance.
- Optimize hyperparameters to improve predictive accuracy.

Deployment & Monitoring

- Deploy the model as a GUI for healthcare professionals.
- Implement real-time monitoring to track model performance and detect data drift.
- Enable periodic retraining with updated patient data for continuous improvement.