**Project Idea Proposal**

**اسم : نیازالله**

**تخلص : رحمت زی**

**مضمون : تکنالوژی مدرن**

**سمستر : هفتم**

**1. Project Idea:**

**Title:** *Predicting Heart Disease Using Machine Learning*  
Heart disease is one of the leading causes of death worldwide. Early detection can save lives by allowing preventive measures.  
**Goal:** The goal of this project is to develop a machine learning model that predicts the likelihood of heart disease based on patient health data (such as age, cholesterol, blood pressure, etc.).

**2. Literature Examples:**

1. **Research Paper:** *"Heart Disease Prediction Using Machine Learning Algorithms"* (International Journal of Engineering Research, 2022).  
   This study used logistic regression and random forest algorithms to classify patients based on clinical features, achieving 85% accuracy.
2. **Project Example:** *Kaggle Heart Disease UCI Dataset Project (2023)*  
   This project applied multiple ML models (SVM, Decision Tree, and KNN) to predict heart disease and compared their performances.

These studies show that machine learning can successfully analyze structured health data to detect potential risks early.

**3. Describe Your Data:**

The dataset will be the **Heart Disease UCI Dataset** from Kaggle

* **Source:** UCI Machine Learning Repository / Kaggle
* **Format:** CSV file (tabular data with 14 columns, 303 rows)
* **Size:** ~30 KB
* **Features:** age, sex, chest pain type, resting blood pressure, cholesterol, fasting blood sugar, etc.
* **Preprocessing:**
  + Handling missing values
  + Normalizing numerical features
  + Encoding categorical variables

**4. Approach (Machine Learning):**

A **Machine Learning** approach will be used because the dataset is structured and relatively small. Algorithms such as **Logistic Regression**, **Random Forest**, and **Support Vector Machine (SVM)** will be applied.  
Deep learning is not necessary since the data does not involve images or large-scale unstructured inputs.  
The best model will be selected based on accuracy, precision, and recall metrics