SONAR Rock vs Mine Prediction

Project Title

SONAR Rock vs Mine Prediction using Machine Learning

Project Objective

The objective of this project is to build a machine learning model that can classify underwater objects as either a Rock or a Mine based on SONAR signal data.

Problem Type

Machine Learning Type: **Supervised Learning**
Task: Binary Classification
Target Variable: Object type (Rock or Mine)

Dataset Description

Dataset Name: SONAR Dataset
Source: UCI Machine Learning Repository
Total Instances: 208
Number of Features: 60
Feature Type: Numerical
Target Classes: Rock (R), Mine (M)

Input and Output

Input (X): 60 numerical SONAR signal features
Output (y): Rock or Mine

Algorithm Used

Logistic Regression

Chosen because it is simple, interpretable, and suitable for binary classification.

Project Workflow

1. Load dataset
2. Explore data
3. Separate features and target
4. Train-test split
5. Train model
6. Evaluate model
7. Make predictions

Model Evaluation

Accuracy score is used to evaluate model performance on training and testing data.

Conclusion

The model successfully classifies SONAR signals into Rock or Mine, demonstrating a complete beginner-level ML workflow.

Project Diagram