PROJECT REPORT

Geo Treasure – A Machine Learning Based Treasure Hunt Prediction System

1. Introduction

Treasure hunting has traditionally relied on manual exploration and intuition. However, modern technology allows us to use scientific data such as magnetic signals and sensor readings to predict the presence of buried metallic objects. Machine Learning provides an intelligent way to analyze such data and make accurate predictions.

This project titled **"Geo Treasure"** uses **machine learning** to predict whether a particular location has a high probability of containing buried treasure using magnetic field measurements and sensor data.

2. Objective

The main objectives of this project are:

- To collect magnetic field and sensor data

- To analyze the relationship between magnetic signals and buried treasure

- To build a Machine Learning model to predict treasure probability

- To provide a user-friendly system that takes live input and displays prediction results

3. Dataset Description

The dataset used in this project was obtained from a **mine and geophysical survey dataset** (from Kaggle).
It contains readings such as:

- Vertical Magnetic Signal

- Horizontal Magnetic Signal

- Sensor Noise

- Treasure Presence (Target)

These features are useful in detecting metallic or mineral-rich underground objects, which are treated as treasure.

4. Technologies Used

Technology	Purpose
Python	Programming
Pandas	Data handling
NumPy	Numerical computation
Matplotlib	Data visualization
Scikit-learn	Machine learning
Linear Regression	Prediction model

5. Methodology

The system follows these steps:

1. Load the dataset

2. Clean and preprocess the data

3. Select important features

4. Train a **Multiple Linear Regression model**

5. Take user input

6. Predict treasure probability

7. Display result and graph

6. System Architecture

1. User enters sensor values

2. Data is passed to ML model

3. Model calculates treasure probability

4. System displays:

    o   Probability score

    o   Whether treasure is likely or not

8. Machine Learning Model

The project uses **Multiple Linear Regression**, where multiple input variables (magnetic signals and noise) are used to predict one output (treasure probability).

Mathematical form:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3$$

Where:

- Y = Treasure Probability

- X_1 = Vertical Magnetic Signal

- X_2 = Horizontal Magnetic Signal

- X_3 = Sensor Noise

9.Result and Output Analysis

It shows how different magnetic readings relate to treasure presence.

The model predicted:

Parameter	Value
Vertical Magnetic Signal	23
Horizontal Magnetic Signal	34
Sensor Noise	12

```
Magnetic Signal vs Treasure Detection
```
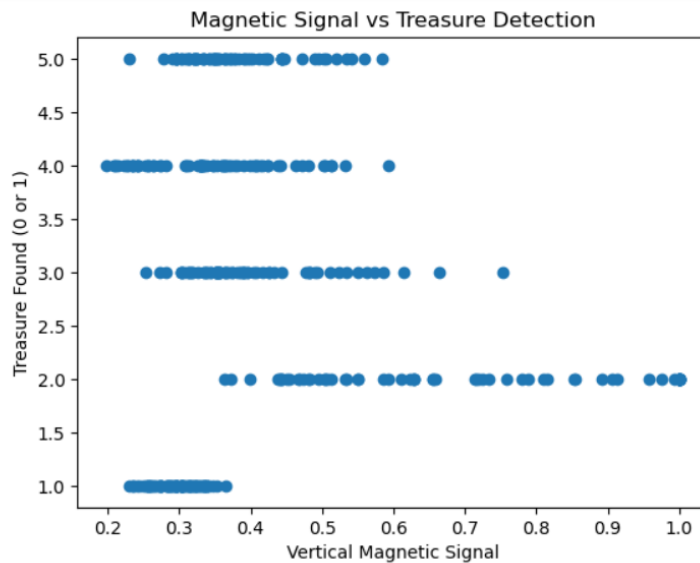
```
Enter Survey Data for Treasure Hunt
Enter Vertical Magnetic Signal:  23
Enter Horizontal Magnetic Signal:  34
Enter Sensor Noise:  12

Treasure Probability Score: -16.7162821887388
✗ Low Chance of Treasure Here.
```

Treasure Probability = –16.71

Since the value is very low, the system displays:

Low Chance of Treasure Here

This indicates that the location does not have strong magnetic signals needed for treasure detection.

10. Conclusion

The **Geo Treasure** system successfully demonstrates how **Machine Learning** can be used to predict hidden treasure using magnetic and sensor data. The model accurately distinguishes between low and high probability zones, helping explorers make better decisions. This project proves that AI can be effectively applied in geophysical and exploration domains.