Team: METAMINDS

Name: Saiteja Siripurapu

Student ID: 2291829

Project: Seismic Acquisition 3D Mapping System

Overview:

Seismic acquisition involves generating seismic waves at the surface and recording how these waves travel through the subsurface. The goal of this project is to calculate and analyze the **multiplicity and offset curve** in a seismic survey, given the distance between geophones and the range of sources. These parameters are critical for optimizing the survey design and ensuring proper subsurface coverage for high-quality 3D seismic imaging.

Requirements:

1.**User Input Parameters:**

Users will provide key seismic acquisition parameters:

- Distance between geophones: The distance between adjacent geophones in a seismic acquisition line.
- Distance between source points: The distance between source points.
- Range of geophones: The range of geophones to consider, defining the extent of the area for multiplicity and offset calculation.

2. **Multiplicity and Offset Calculation:**

Based on user inputs, the system will compute the following:

- Multiplicity Curve: Determine the multiplicity factor, which shows the redundancy of seismic data, based on the spacing between geophones and source points.
- Offset Curve: Generate offset curves that illustrate the variation in source-to-geophone distances within the specified range, highlighting the distribution of offsets which enables the users in analysing the range of collected seismic data.

3. **Output Visualization:**

- Multiplicity Curve: A plot showing the multiplicity values for each geophone or a series of geophones within the specified range.
- Offset Curve: A plot showing the distribution of offsets for each source-geophone pair within the specified range.

Example diagrams: