EXPERIMENT - 01: Predicting the age of Abalone (type of snail) using linear regression

Problem Statement

The goal of this experiment is to predict the age of Abalone (type of snail) using linear regression. Also to perform **Exploratory Data Analysis (EDA)** on the dataset, train and evaluate the model, and analyse its performance.

Dataset Description

- Dataset: **Abalone** (link: https://archive.ics.uci.edu/dataset/1/abalone)
- Attributes: 8 features and number of rings (age = rings + 1.5)
- Total records: 4177
- Data type: Real values + Categorical + Integer

Task 1: Dataset Loading and Exploratory Data Analysis (EDA)

1. Import required Python libraries (NumPy, Pandas, Matplotlib).
2. Load the dataset into a DataFrame.
3. Display:
    - First 10 records
    - Dataset shape
4. Check for:
    - Missing values
    - Duplicate records

Task 2: Model Building Using Linear Regression

1. Split the dataset into:
    - Training set (80%)
    - Testing set (20%)
2. Train a **Linear Regression** model.
3. Fit the model using training data.
4. Predict the age of Abalone for test data.

Task 3: Model Evaluation and Performance Analysis

Evaluate the model using: Mean Absolute Error (MAE), Mean Squared Error (MSE), and R^2 Score.