# Task: Linear Regression with Custom Implementation and Benchmarking

You are required to implement and evaluate a simple linear regression model using gradient descent. Follow the steps below to complete the task:

1. **Implement a Cost Function**
   - Create a function to compute the Mean Squared Error (MSE), which will be used to evaluate the performance of the model.
2. **Implement Gradient Descent for Linear Regression**
   - Develop a gradient descent algorithm to optimize the weights of a linear regression model.
   - Use the provided dataset for training.
   - Data Preprocessing:
   - Normalize the input data using standard scaling or another suitable normalization technique.
   - Visualization: Plot the normalized datapoints before training the model.
3. **Evaluate Your Custom Model**
   - After training, measure the performance of your model using the following metrics:
     - Mean Squared Error (MSE)
     - Root Mean Squared Error (RMSE)
     - Mean Absolute Error (MAE)
     - R-squared (R-squared score)
4. **Compare with Scikit-learn Implementation**
   - Fit a linear regression model using sklearn.linear_model.LinearRegression on the same preprocessed dataset.
   - Retrieve and report the coef_ (model coefficients) and intercept_ (bias term).
   - Compare these values with the parameters obtained from your custom implementation. Discuss any similarities or differences.
5. **Implement a piecewise regression model on the provided dataset**
   - Find the suitable number of breakpoints
   - Evaluate the piecewise regression model and compare it to the previous implementation