**Simple Linear Regression Analysis**

**Model Overview:**

A Simple Linear Regression model was developed to predict **Life Expectancy** (dependent variable) using **BMI** (independent variable). The dataset was split into a training set (80% of the data) and a testing set (20% of the data) for model evaluation.

**Key Parameters:**

* **Intercept (𝛽₀)**: The model's intercept is **60.07**, which indicates the predicted Life Expectancy when BMI is 0.
* **R-Squared**: The model's R-squared value is **0.32**, meaning it accounts for 32% of the variation in Life Expectancy. This suggests that other factors beyond BMI play a significant role in influencing Life Expectancy.

**Multiple Linear Regression Analysis**

**Model Overview:**

A Multiple Linear Regression model was employed to estimate **Life Expectancy** using multiple predictors. To make the model compatible, categorical variables like **Country** and **Status** were converted into numerical format through encoding techniques.

**Key Parameters:**

* **Intercept (𝛽₀)**: The intercept value of **281.26** represents the predicted Life Expectancy when all predictors are at zero.
* **R-Squared**: With an R-squared value of **0.8166**, the model explains approximately 81.66% of the variance in Life Expectancy. This indicates a strong relationship between the predictors and the outcome variable.
* **Mean Squared Error (MSE)**: The model's MSE is **13.0247**, representing the average squared deviation between actual and predicted Life Expectancy values.

For the Life Expectancy values typically ranging between 60 and 80 years, this error is minority.