**What is Normalization & Standardization and how is it helpful?**

Normalization and standardization are two techniques used to transform data into a common scale. Normalization is a technique used to scale numerical data in the range of 0 to 1. This technique is useful when the distribution of the data is not known or when the data is not normally distributed. On the other hand, standardization is a technique used to transform data into a standard normal distribution. This technique is useful when the distribution of the data is known and when the data is normally distributed.

Both methods help machine learning models perform optimally by balancing the impact of features, reducing the influence of outliers, and, in some cases, improving convergence rates

**What techniques can be used to address multicollinearity in multiple linear regression ?**

Multicollinearity occurs when independent variables in a regression model are highly correlated, making it difficult to estimate their effects. Here are ways to address it:

1. Diagnose: Use tools like Variance Inflation Factor (VIF), correlation matrices, or condition indices to identify multicollinearity.
2. Remove Variables: Drop one of the highly correlated variables based on importance or theoretical relevance.
3. Combine Variables: Use techniques like Principal Component Analysis (PCA) to combine correlated variables into uncorrelated components.
4. Regularization: Apply Ridge or Lasso regression to shrink or eliminate coefficients, reducing multicollinearity’s impact.
5. Center and Scale: Standardize variables or center interaction terms to reduce multicollinearity effects.
6. Increase Data: Collect more data to stabilize coefficient estimates.
7. Simplify: Use composite indices or ratios based on domain knowledge.