Task 24 by Jawad Ahmed

Mean Absolute Error (MAE):

- **Description:** Measures the average magnitude of errors between predicted and actual values.
- **Formula:** MAE= $\frac{1}{n}\sum_{i=1}^{n}|y_i - \hat{y}_i|$
- **Use:** Provides a straightforward measure of prediction accuracy.

 Mean Squared Error (MSE):

- **Description:** Computes the average of the squares of errors, giving more weight to larger errors.
- **Formula:** $\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2$
- **Use:** Useful for highlighting significant errors, but can be sensitive to outliers.

 Root Mean Squared Error (RMSE):

- **Description:** The square root of MSE, providing error estimates in the same unit as the target variable.
- **Formula:** RMSE= $\sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}$
- **Use:** Helps in interpreting the magnitude of errors in the context of the data's units.

 R-squared (R^2):

- **Description:** Indicates the proportion of the variance in the dependent variable explained by the model.
- **Formula:** R2= $1 - \frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{\sum_{i=1}^{n}(y_i - \bar{y})^2}$
- **Use:** Provides a measure of goodness-of-fit, but can be misleading with overfitting.

 Adjusted R-squared:

- **Description:** Adjusts the R^2 value for the number of predictors in the model.
- **Formula:** Adjusted R2= $1 - \frac{(1-R^2)(n-1)}{n-p-1}$
- **Use:** More accurate for comparing models with different numbers of predictors.

 Mean Absolute Percentage Error (MAPE):

- **Description:** Measures the accuracy as a percentage by comparing the absolute errors to actual values.
- **Formula:** MAPE= $\frac{100\%}{n}\sum_{i=1}^{n}\left|\frac{y_i - \hat{y}_i}{y_i}\right|$
- **Use:** Useful for understanding model accuracy in relative terms, but can be problematic with zero values in actual data.