**Evaluation metrics for simple linear regression**

In this reading, we’ll provide a more comprehensive overview about evaluation metrics for simple linear regression. In a prior video we covered R², and mentioned a few other metrics, MAE and MSE. In this reading, we will review the metrics we’ve previously mentioned, and introduce a few more as well that you may encounter throughout your career as a data professional.

**Review of R², MSE, and MAE**

The main evaluation metric for linear regression is R², or the coefficient of determination.

**R²: The coefficient of determination**

**R²** measures the proportion of variation in the dependent variable, Y, explained by the independent variable(s), X.

* This is calculated by subtracting the sum of squared residuals divided by the total sum of squares from 1.

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R² ranges from 0 to 1. So, if a model has an R² of 0.85, that means that the X variables explain about 85% of the variation in the Y variable. Although R² is a highly interpretable and commonly used metric, you may also encounter mean squared error (MSE) and mean absolute error (MAE) when R² is insufficient in evaluating model performance.

**MSE: Mean squared error**

**MSE (mean squared error)** is the average of the squared difference between the predicted and actual values.

* Because of how MSE is calculated, MSE is very sensitive to large errors.

**MAE: Mean absolute error**

**MAE (mean absolute error)** is the average of the absolute difference between the predicted and actual values.

* If your data has outliers that you want to ignore, you can use MAE, as it is not sensitive to large errors.

**Other evaluation metrics**

Beyond the three metrics listed above, you may also encounter [**AIC (Akaike information criterion) and BIC (Bayesian information criterion)**](https://machinelearningmastery.com/probabilistic-model-selection-measures/).

Lastly, there is **adjusted R²**, which will be addressed in more detail in upcoming videos. It is a variation of R² that accounts for having multiple independent variables present in a linear regression model.

**Key takeaways**

* There are many evaluation metrics to choose from with regard to simple linear regression.
* The most common evaluation metric you’ll encounter is probably R². But, there are times when R² is insufficient or inappropriate to use.
* Based on your experiences and the particulars of a metric, you can use your best judgment to select an appropriate metric to evaluate a regression model.