Evaluating Model Performance: Takeaways

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Syntax

- Splitting the original dataset into a training and test set using createDataPartition()

```
train_indices <- createDataPartition(y = dc_listings[["tidy_price"]],
                                     p = 0.7,
                                     list = FALSE)
                              list = FALSE)
train <- data[train_indices,]
test <- data[ -train_indices,]
```

- Setting the parameters for training the model using trainControl()

```
train_control <- trainControl(method = "none")
```

- Creating a trained machine learning model using train()

```
knn_model <- train(outcome ~ predictor1 + predictor2,
                   data = training_data,
                   method = "knn",
                   trControl = train_control)
```

- Predicting outcomes from a trained model using `predict()`

```
test_predictions <- predict(knn_model, newdata = test_listings)
```

Concepts

- We evaluate the performance of a machine learning model by checking how well the model accurately predicts the outcomes of data it hasn't seen yet.
- One way we can evaluate the performance of a model is through **holdout validation**, where we split a dataset into a training and test set. After this split, we train the model on the training set and test the model's predictions using the test set.
- Our holdout validation process goes as follows:
    - Split a dataset into two separate sets, a training and test set.
    - Train the algorithm using the data from the training set.
    - For each listing in the test set, we will calculate predictions for the rental price.
    - Compare these predictions against the *actual* values of the listings as given in the `tidy_price` column.
    - Create a single summary error metric that we can use to judge the performance of the model.
- The `caret` library helps streamline the process of creating and evaluating machine learning models in R.
- To summarize and quantify how good the predictions are for the test set, you would use an error metric. The error metric provides a single number that summarizes the differences between each predicted and actual value, and then averaging those differences. In our mission, we learned the RMSE.

Resources

- MAE and RMSE comparison
- About Train, Validation, and Test Sets in Machine Learning

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