

# Decision Tree Regression

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Imagine you are trying to predict the price of a house based on its features, such as the number of bedrooms, bathrooms, and square footage. You could use Decision Tree Regression to build a model that learns the patterns in the data to make accurate predictions.

So how does this "tree" work? Well, it's like a game of 20 questions. The algorithm asks a series of questions to split the data into smaller and smaller groups, until it reaches a point where it can make a prediction. For example, it might ask "Does the house have more than 3 bedrooms?" If the answer is yes, it will follow one branch of the tree, and if the answer is no, it will follow a different branch. It keeps asking questions until it reaches a point where it can make a prediction, such as "The predicted price of this house is \$500,000."

Now, you might be wondering why we call it "Regression" instead of "Classification." Well, in Decision Tree Regression, instead of predicting a category (like "yes" or "no"), we predict a numerical value. So in our example, instead of predicting whether a house is expensive or cheap, we are predicting the actual price.

But wait, there's more! Decision Tree Regression also allows us to handle non-linear relationships between the features and the target variable. It can handle interactions between multiple features, and can even handle missing values in the data.

So where can we use Decision Tree Regression in real life? Well, it's used in a variety of fields such as finance, marketing, and healthcare. For example, a bank might use Decision Tree Regression to predict whether a customer is likely to default on a loan based on their credit history.