What is machine learning?

100 XP

5 minutes

Machine learning is a technique that uses mathematics and statistics to create a model that can predict unknown values.

For example, suppose *Adventure Works Cycles* is a business that rents cycles in a city. The business could use historic data to train a model that predicts daily rental demand in order to make sure sufficient staff and cycles are available.

To do this, Adventure Works could create a machine learning model that takes information about a specific day (the day of week, the anticipated weather conditions, and so on) as an input, and predicts the expected number of rentals as an output.

Mathematically, you can think of machine learning as a way of defining a function (let's call it *f*) that operates on one or more *features* of something (which we'll call *x*) to calculate a predicted *label* (*y*) - like this:

$$f(x) = y$$

In this bicycle rental example, the details about a given day (day of the week, weather, and so on) are the *features* (*x*), the number of rentals for that day is the *label* (*y*), and the function (*f*) that calculates the number of rentals based on the information about the day is encapsulated in a machine learning model.

The specific operation that the *f* function performs on *x* to calculate *y* depends on a number of factors, including the type of model you're trying to create and the specific algorithm used to train the model. Additionally in most cases, the data used to train the machine learning model requires some pre-processing before model training can be performed.

The following video discusses the various kinds of machine learning model you can create, and the process generally followed to train and use them.

Azure Machine Learning

Training and deploying an effective machine learning model involves a lot of work, much of it time-consuming and resource-intensive. Azure Machine Learning is a cloud-based service that helps simplify some of the tasks and reduce the time it takes to prepare data, train a model, and deploy a predictive service. In the rest of this unit, you'll explore Azure Machine Learning, and in particular its *automated machine learning* capability.

Next unit: Create an Azure Machine Learning workspace