

# How to use a model

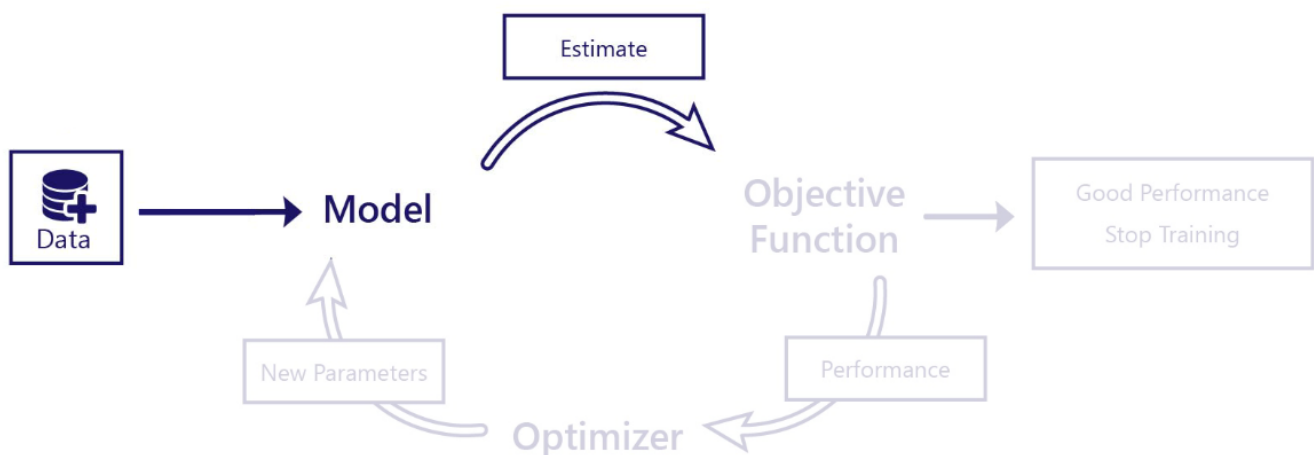
6 minutes

Let's revise how these parts fit together to train a model.

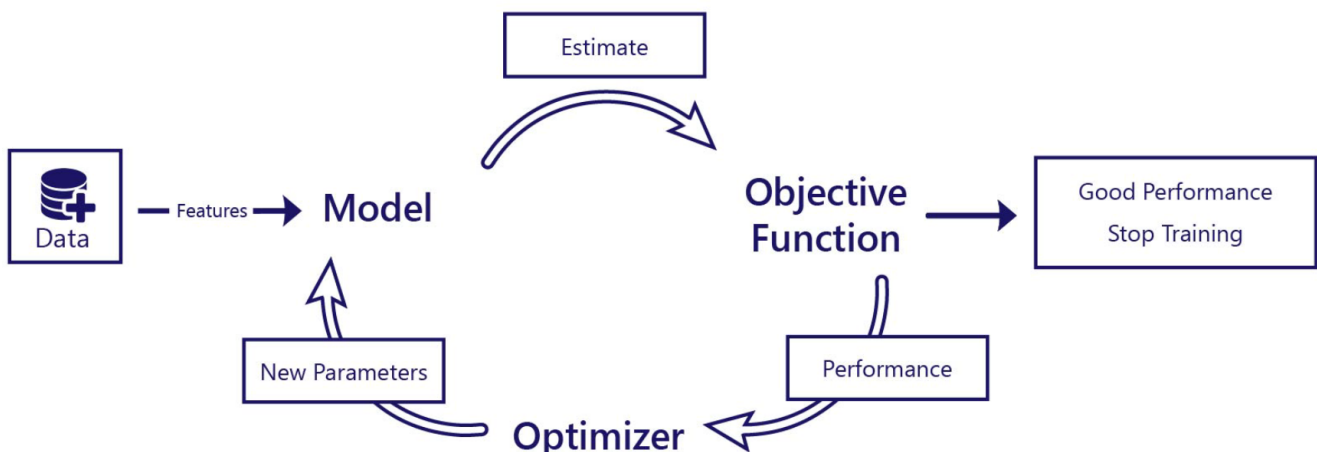
## Training versus using a model

It is important to make a distinction between training and using a model.

Using a model means providing inputs and receiving an estimation or prediction. We do this both when we are training our model and when we, or our customers, use it in the real world. Using a model normally takes less than a few seconds.



By contrast, training a model is the process of improving how well a model works. Training requires that we use the model, as well as the objective function and optimizer, in a special loop. This can take minutes or days to complete. Usually, we only train a model once. Once it is trained, we can use it as many times as we like without making further changes.



For example, in our avalanche-rescue dog store scenario, we want to train a model using a public dataset, which will change the model so that it can predict a dog's boot size based on its harness size. Once our model is trained, we will use the model as part of our online store to make sure customers are buying doggy boots that will fit their dog.

## Data for use, data for training

Recall that a dataset is a collection of information about objects or things. For example, a dataset might contain information about dogs:

Dog ID	Boot Size	Harness Size	Dog Color	Breed
0	27	12	Brown	St Bernhard
1	26	11	Black	Labrador
2	25	10	White	Labrador
3	29	14	Black	Black Shepherd

When we use our model, we only need the column(s) of data that the model accepts as input. **These columns are called features.** In our scenario, if our model accepts harness size and estimates boot size, then **our feature is harness size.**

During training, the objective function usually needs to know both the model's output and what the correct answer was. **These are called labels.** In our scenario, if our model predicts boot size, **boot size is our label.**

Taken together, this means that to use a model, we only ever need features, while during training we usually need both features and labels. In our scenario, during training we need both our harness-size feature and our boot-size label. When we use our model in our website, we only need to know the harness-size feature—our model will then estimate the boot size for us to use.

## I've finished training. What now?

Once a model has finished training, it can be saved to file by itself. **We no longer need the original data, the objective function, or the model updater.** When we want to use the model, we can load it from disk, provide it with new data, and get back a prediction.

In our next exercise, we will practice saving a model, loading it from disk, and using it like we would in the real world. To complete our online store scenario, we'll also practice using the

outputs of the model to warn our customers if they seem to be buying the wrong sized doggy boots.

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## Next unit: Exercise - Use machine learning models

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