

End-to-End Machine Learning with ML.NET and Azure

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Hello



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Code

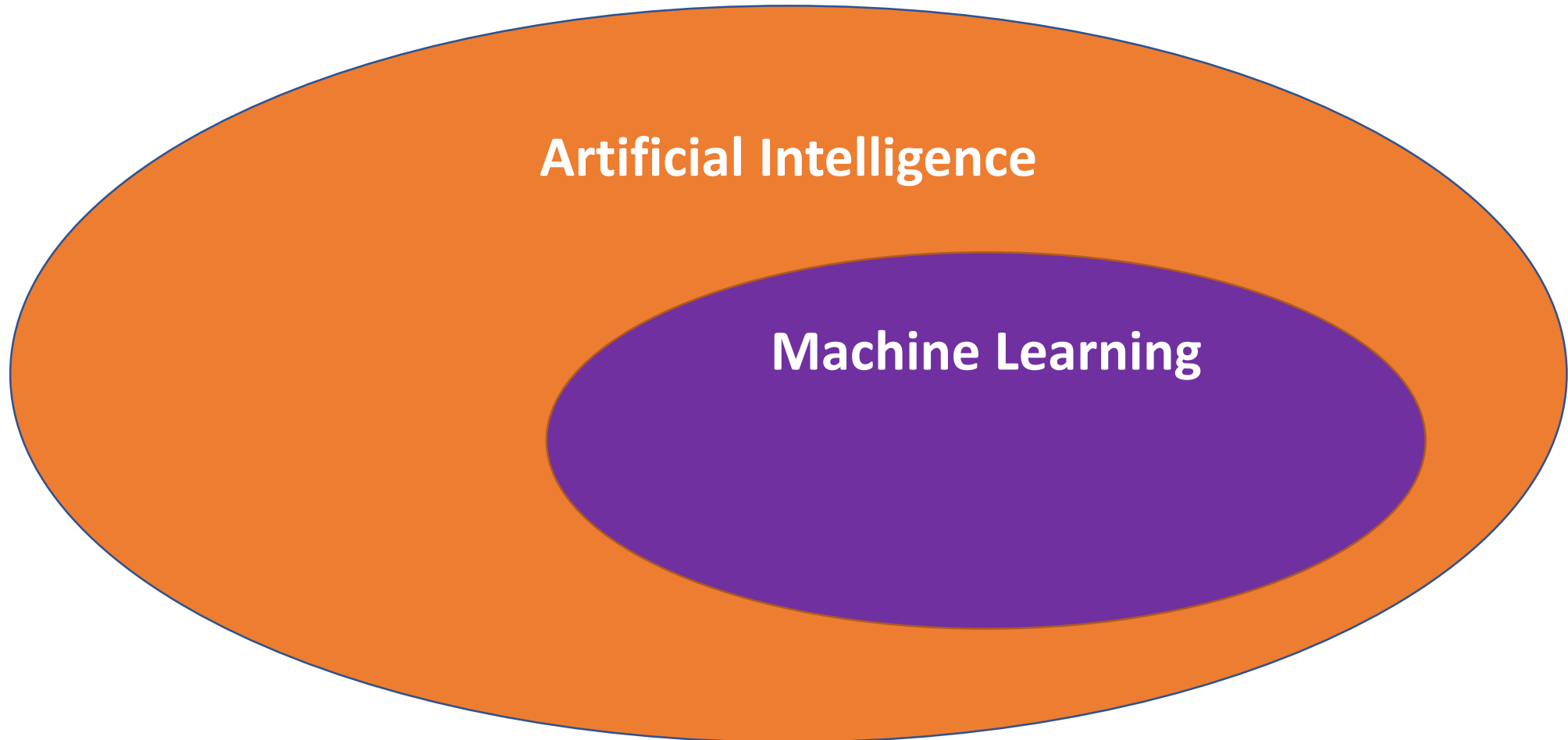
<http://bit.ly/codecampnyc2018>

Agenda

- 01** What is Machine Learning?
- 02** From Data to Machine Learning
- 03** Building a Model
- 04** Deploying a Model

What is Machine Learning?

AI vs ML



Machine Learning Tasks

Supervised Learning

Regression

What is
the price
of a home
in NYC?

Classification

Is this a
dog or
cat?

Unsupervised Learning

Clustering

Customer
segments
in a
database

Classification Example

Training Data

Species	Is Independent	Class
Canine	False	Dog
Feline	True	Cat
Feline	True	Cat
Canine	False	Dog
Canine	True	Dog

Features

Label

New Data

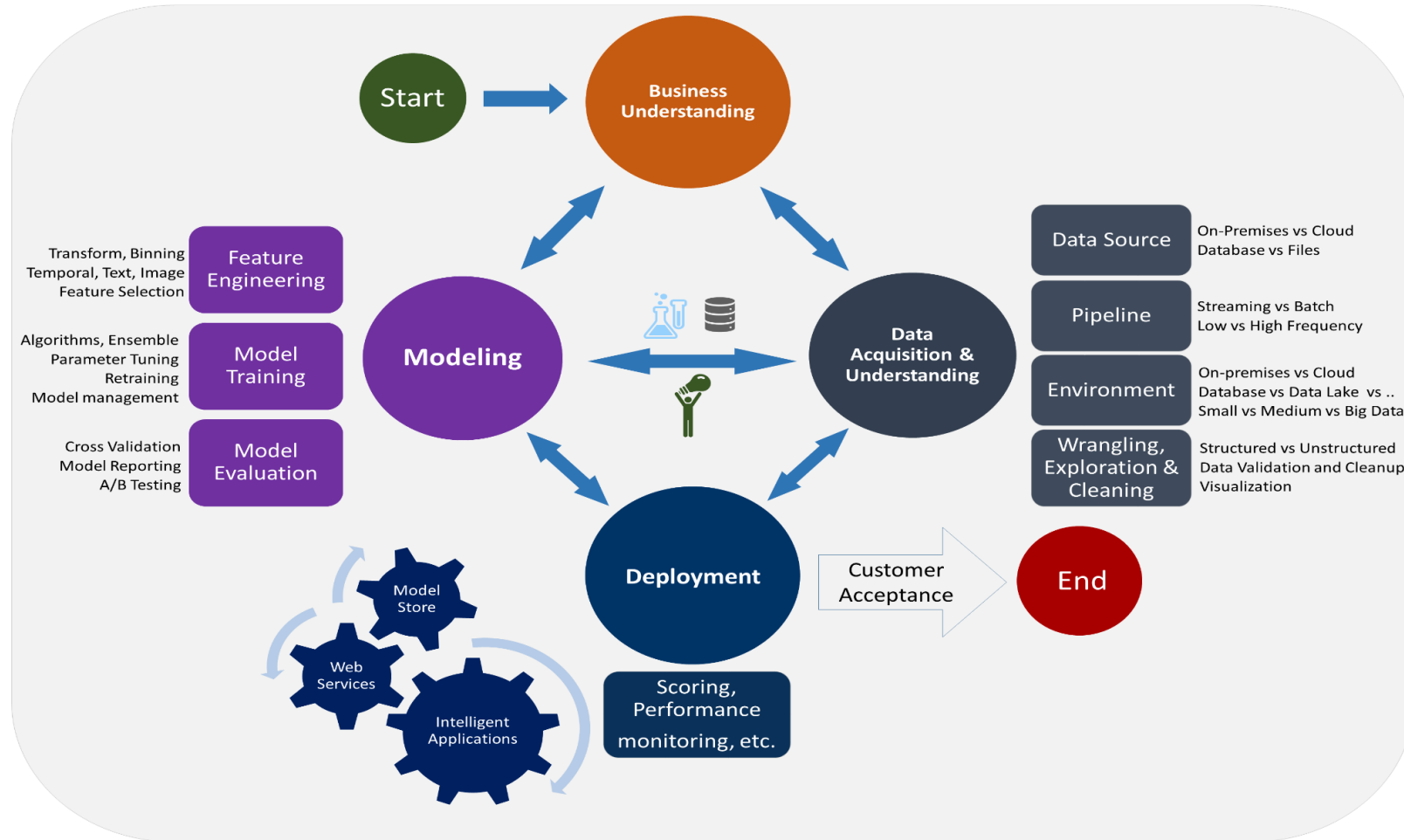
Species	Is Independent
Canine	False

Prediction

Class
Dog

From Data to Machine Learning

The Machine Learning Process



What is a **model**?



Input



$f(x)$

Model

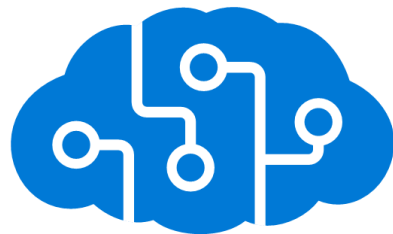
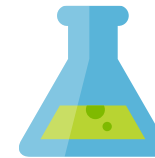


$\left\{ \begin{array}{l} \text{True} \\ \text{False} \end{array} \right.$

Output

Building a Machine Learning Model

Machine Learning Tools



Automated vs. Custom



.NET Tools

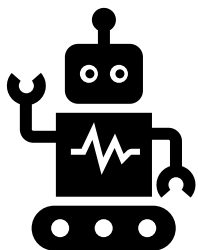


MATH.NET

Opensource Mathematics for .NET



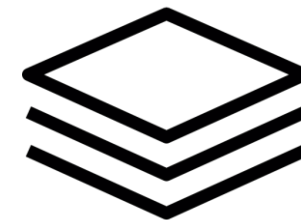
ML.NET



Framework for
Machine Learning



.NET Standard



Proven &
Extensible



Open
Source



Cross
Platform

What can you do with ML.NET?

Transformations

- Missing Values
- Feature Selection
- Normalization

Learners

- SVM
- K-Means
- Boosted Trees

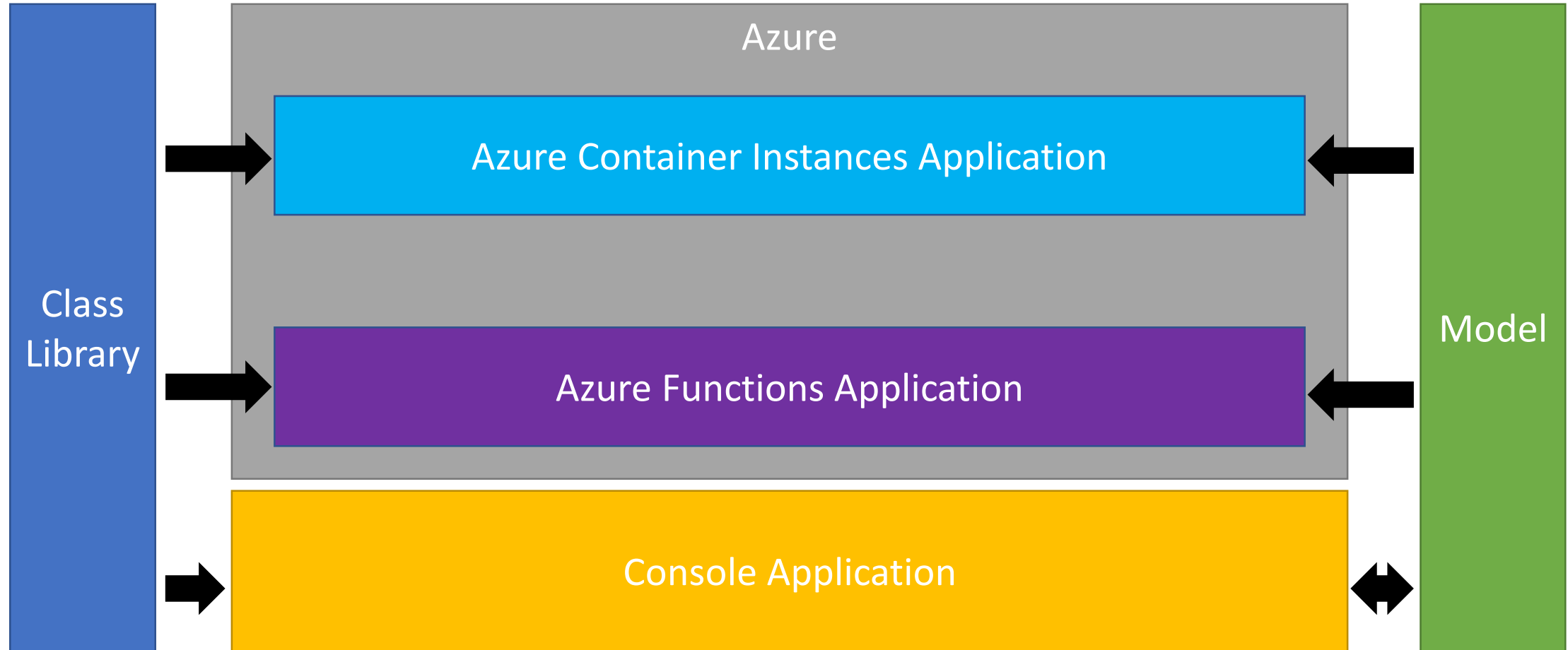
Misc

- Data Loaders
- Evaluators

Extensions

- TensorFlow
- CNTK
- ONNX
- Accord.NET

Iris Classification Model



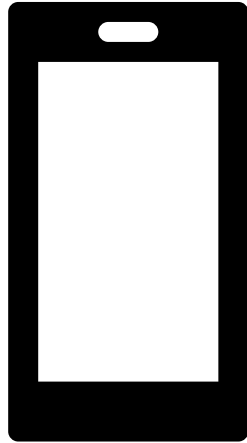
Demo: Training a Model

Consuming a Machine Learning Model

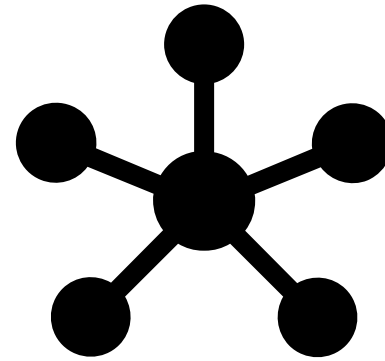
Model Consumption Methods



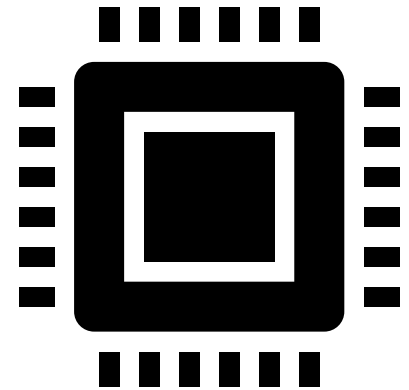
Desktop



Mobile



Web

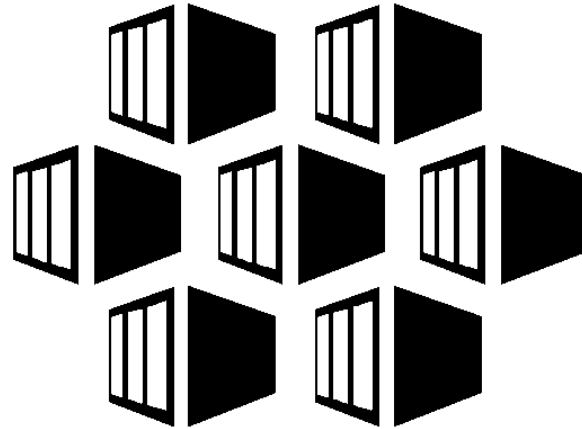


IoT

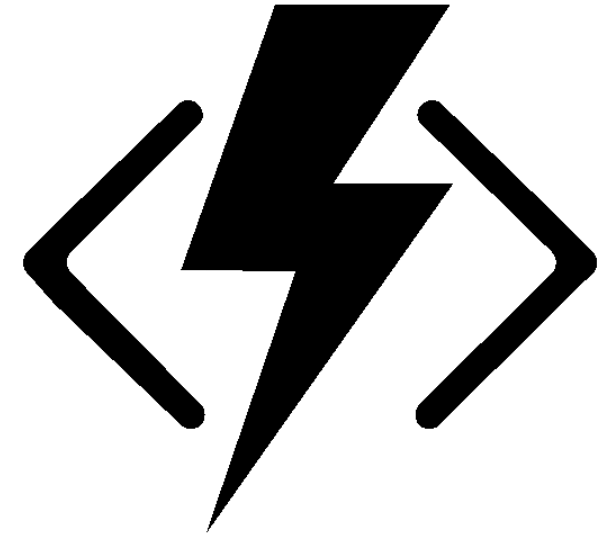
Deploying to the Web



Virtual Machines



Containers



Serverless

Demo: Deploying a Model to Azure Container Instances

Demo: Deploying a Model to Azure Functions

Resources

- <https://docs.microsoft.com/en-us/azure/container-instances/>
- <https://docs.microsoft.com/en-us/azure/azure-functions/functions-run-local>
- <https://blogs.msdn.microsoft.com/dotnet/2018/10/08/announcing-ml-net-0-6-machine-learning-net/>