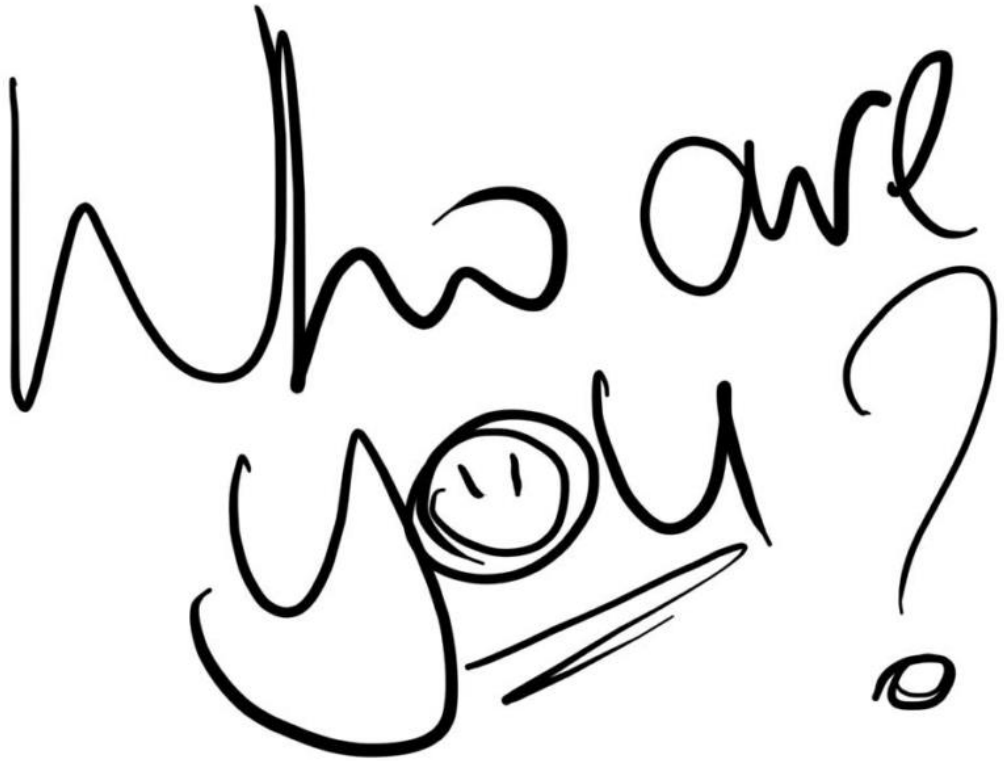
ML.NET

David TOUSSAINT

Qui suis-je ?

Qui êtes-vous ?



Qu'est ce que le Machine Learning ?

« Machine learning, is a branch of artificial intelligence, concerns the construction and study of systems that can learn from data »

Wikipédia

«Field of study that gives computers the ability to learn without being explicitly programmed»

Arthur Samuel

Machine Learning
"Programming the UnProgrammable"

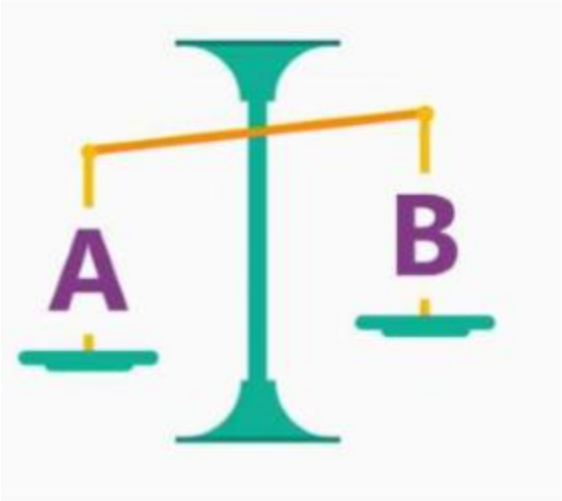
$f(x)$ { Is this a face?

$f(x)$ { Price of Shirt?

"It has **exquisite** buttons … with **long sleeves** …works for casual as well as **business settings**"

Oui mais pour quoi faire ?

Is this A or B?

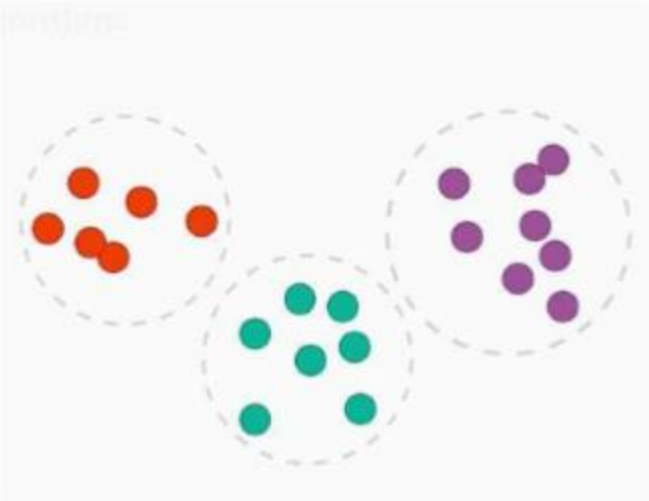


Classification

How much? How many?

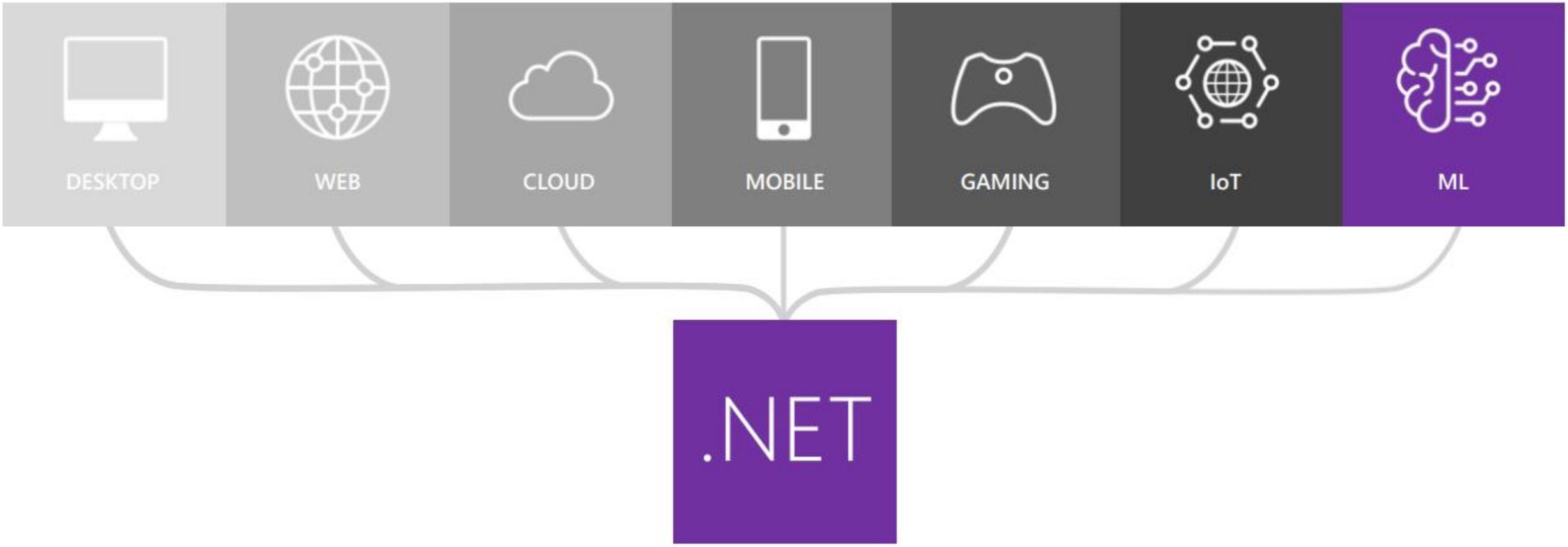
Regression

How is this organized?

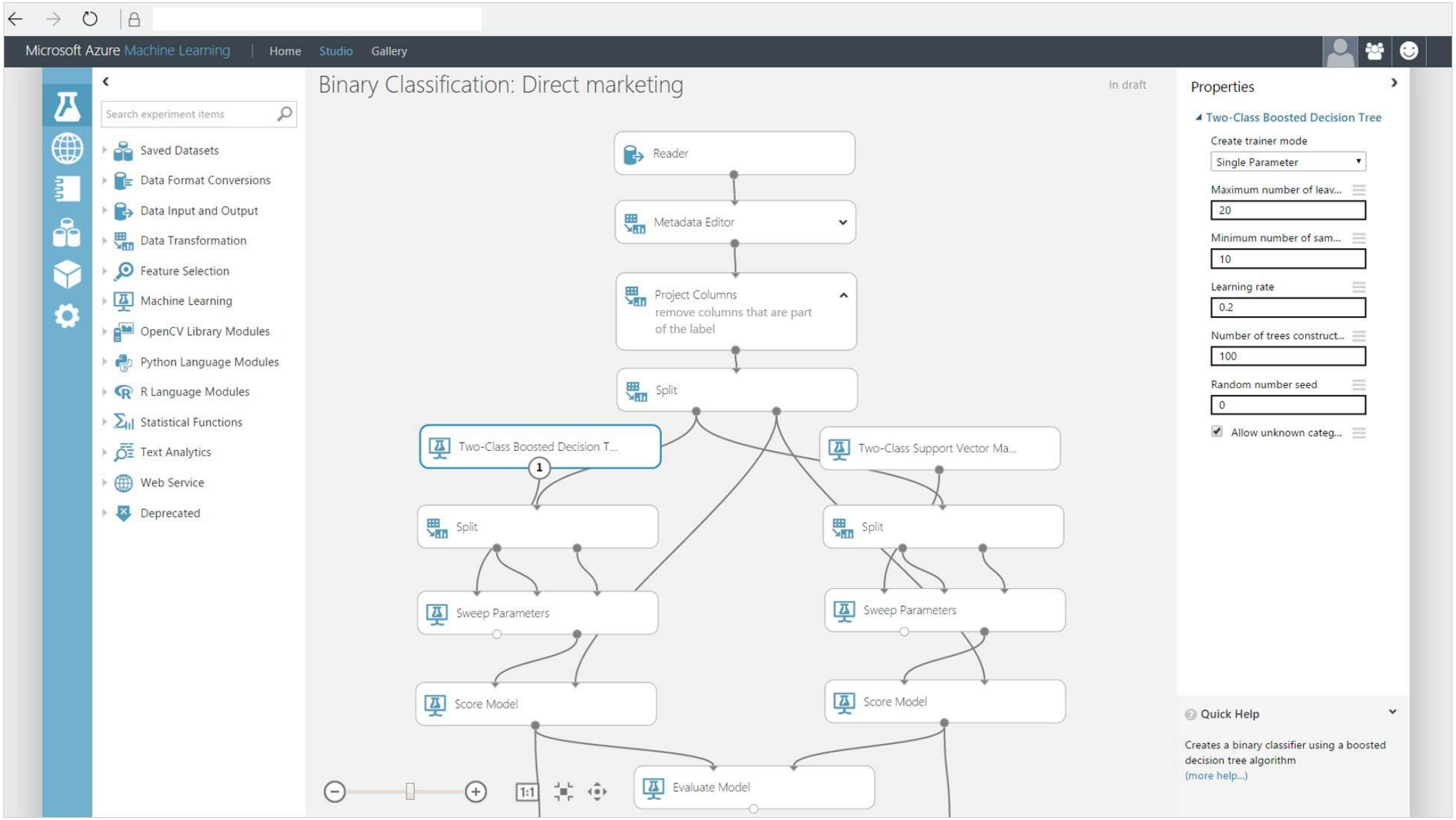


Clustering

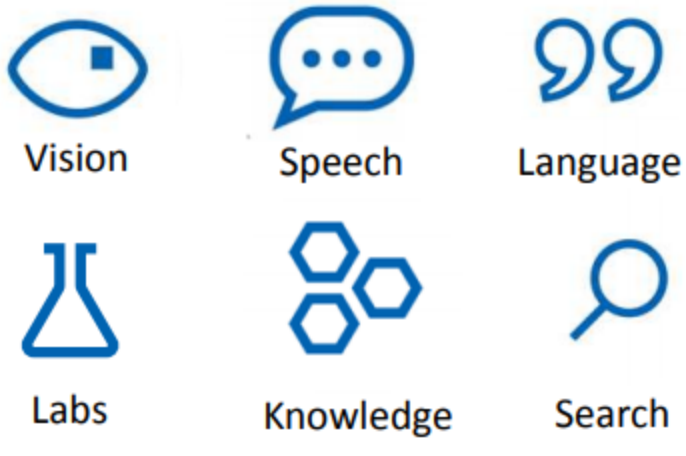
L’ écosystème .Net



MAML


Microsoft Azure Machine Learning
Home
Studio
Gallery
Binary Classification: Direct marketing
In draft
Search experiment items
Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics
Web Service
Deprecated
Reader
Metadata Editor
Project Columns
remove columns that are part of the label
Split
Two-Class Boosted Decision T...
Two-Class Support Vector Ma...
Split
Split
Sweep Parameters
Sweep Parameters
Score Model
Score Model
Evaluate Model
Properties
Two-Class Boosted Decision Tree
Create trainer mode
Single Parameter
Maximum number of leav...
20
Minimum number of sam...
10
Learning rate
0.2
Number of trees construct...
100
Random number seed
0
Allow unknown categ...
Quick Help
Creates a binary classifier using a boosted decision tree algorithm
(more help...)

Azure Cognitive Services



e.g. Sentiment Analysis using Azure Cognitive Services

```
TextAnalyticsAPI client = new TextAnalyticsAPI();
client.AzureRegion = AzureRegions.Westus;
client.SubscriptionKey = "1bf33391DeadFish";

client.Sentiment(
new MultiLanguageBatchInput(
new List<MultiLanguageInput>()
{
 new MultiLanguageInput("en","0",
     "This is a great vacuum cleaner")
}));
```

96% positive

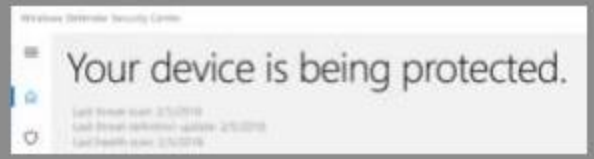
ML.NET CHEZ MS

Bing Ads

Excel

Power Point

Windows 10



Framework de ML pour les devs .NET

Supported on Windows, Linux, and macOS

Build your own

Developer Focused

Open Source

Proven & Extensible

https://github.com/dotnet/machinelearning

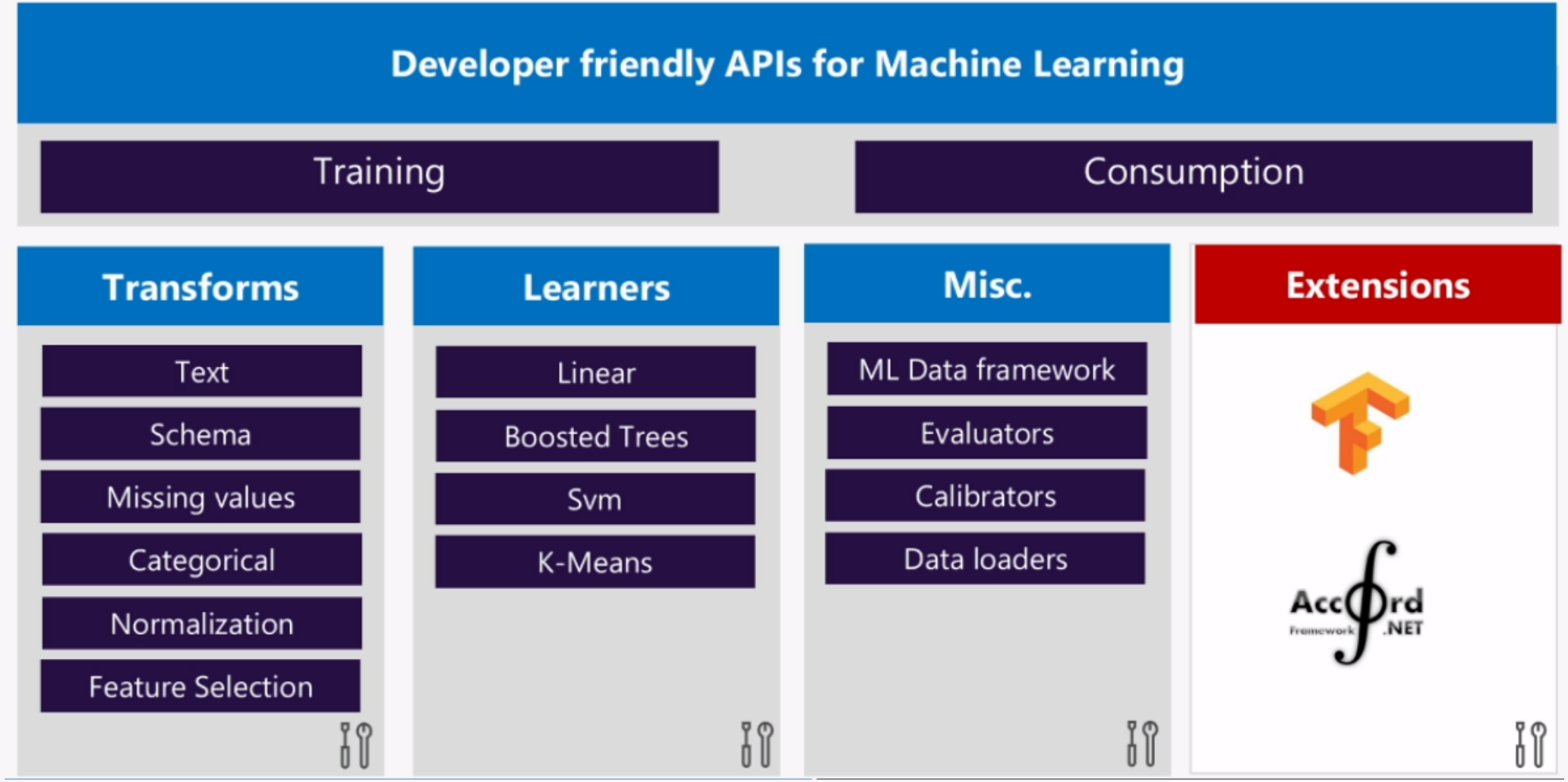
Créer vos propres modèles

Prepare Your Data

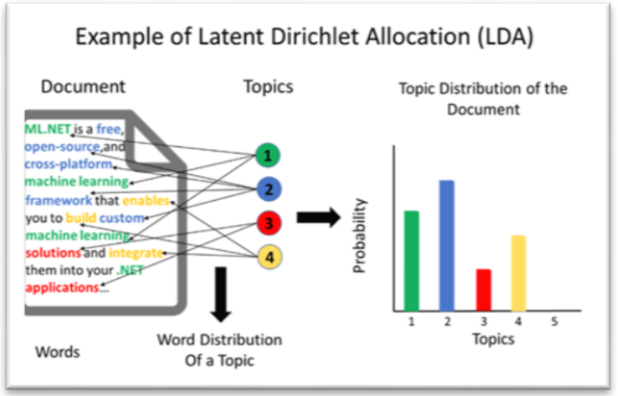
Build & Train

Run

ML.NET Framework

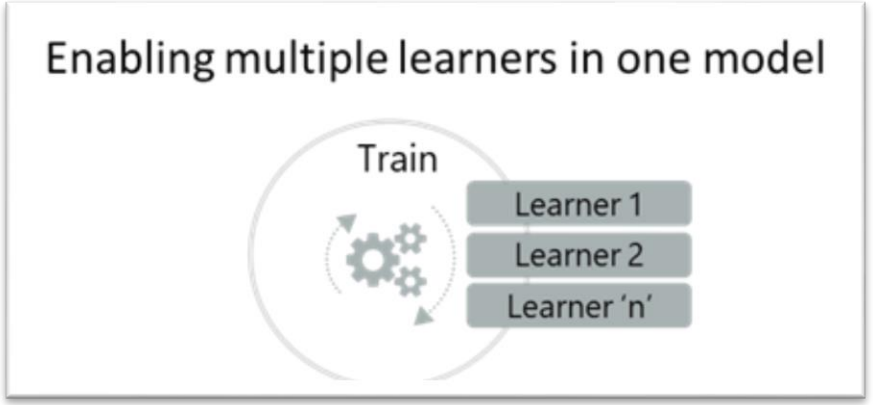


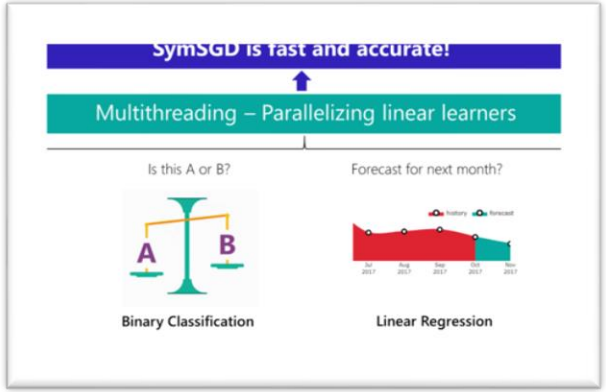
Quoi de neuf depuis ?

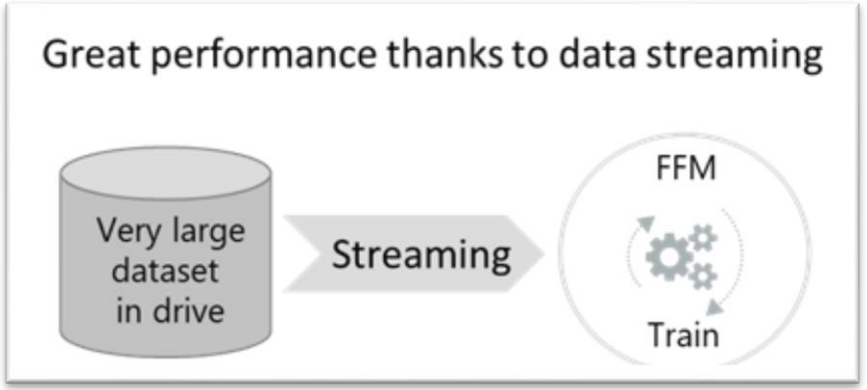


Version 0.5 en release

- Clustering, Recommendation & Deep Learning (TensorFlow)
- Optimisation du training
- Cross validation
- LightLda, Words Embeddings, TensorFlow Scoring
- FFM, LightGBM, Ensemble Learning, SymSGD
- ONNX export
- Amélioration du support de F#





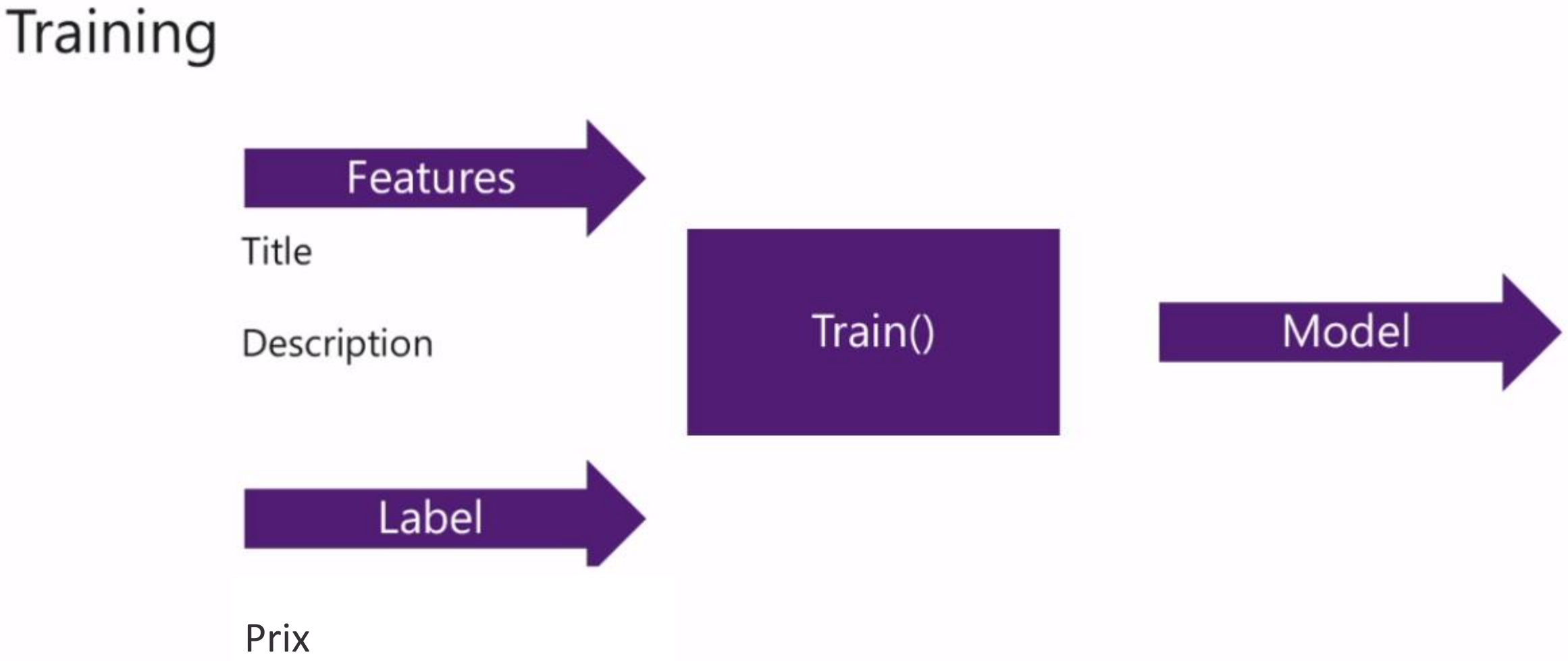


Prédiction du prix d'un vin (Régression)

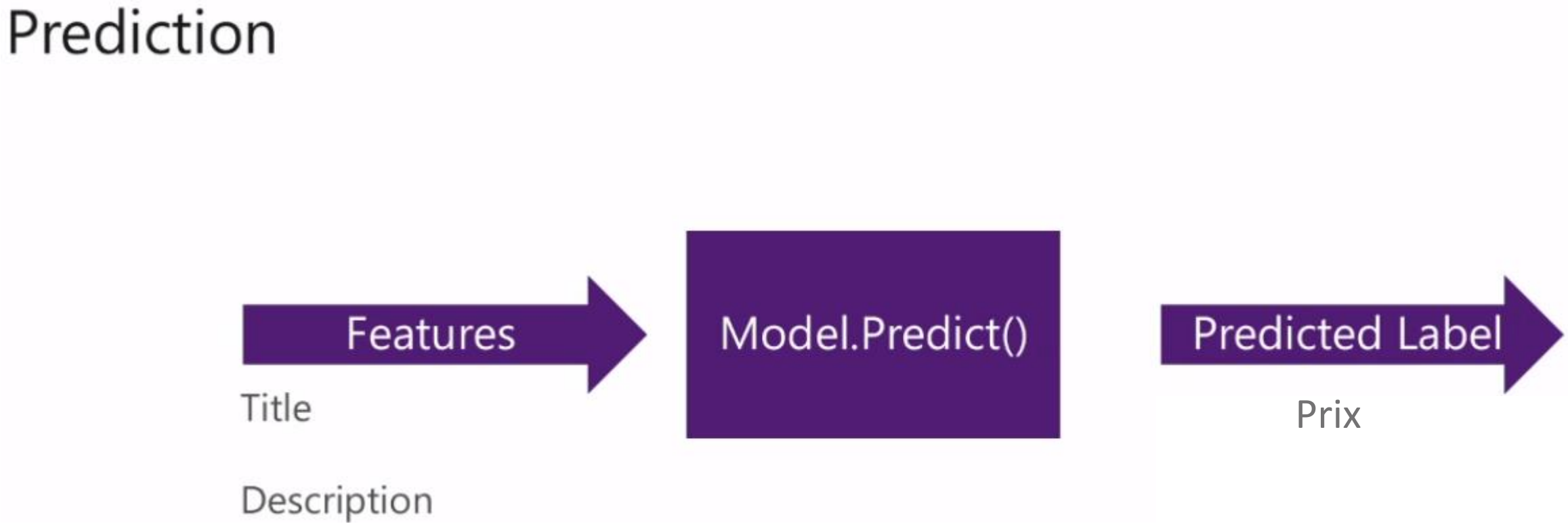
Prédiction du prix d'un vin (Régression)

Id	title	points	prix	province	region_1	region_2	taster_name	taster_twitter_handle	variety	winery	designation
1	Quinta dos Avidagos 2011 Avidagos Red (Douro)	87	15	Douro			Roger Voss	@vossroger	Portuguese Red	Quinta dos Avidagos	Avidagos
10	Kirkland Signature 2011 Mountain Cuvée Cabernet Sauvignon (Napa Valley)	87	19	California	Napa Valley	Napa	Virginie Boone	@vboone	Cabernet Sauvignon	Kirkland Signature	Mountain C
100	Ventosa 2015 Pinot Gris (Finger Lakes)	88	18	New York	Finger Lakes	Finger Lakes	Anna Lee C. Iijima		Pinot Gris	Ventosa	
1000	Arcane Cellars 2006 Cabernet Sauvignon (Rogue Valley)	88	24	Oregon	Rogue Valley	Southern Oregon	Paul Gregutt	@paulgwine	Cabernet Sauvignon	Arcane Cellars	
100000	Caymus 1998 Cabernet Sauvignon (Napa Valley)	89	70	California	Napa Valley	Napa			Cabernet Sauvignon	Caymus	
100001	M. Chapoutier 1999 Le Méal Ermitage (Hermitage)	98	150	Rhône Valley	Hermitage		Roger Voss	@vossroger	Rhône-style Red Blend	M. Chapoutier	Le Méal Erm
100002	J.L. Chave 1999 Hermitage	97	125	Rhône Valley	Hermitage		Roger Voss	@vossroger	Rhône-style Red Blend	J.L. Chave	
100003	Colgin 1999 Herb Lamb Vineyard Cabernet Sauvignon (Napa Valley)	96	150	California	Napa Valley	Napa			Cabernet Sauvignon	Colgin	Herb Lamb
100004	Stag's Leap Wine Cellars 1998 SLV Cabernet Sauvignon (Napa Valley)	96	100	California	Napa Valley	Napa			Cabernet Sauvignon	Stag's Leap Wine Cellars	SLV
100005	Dalla Valle 1999 Maya Red (Napa Valley)	96	120	California	Napa Valley	Napa			Red Blend	Dalla Valle	Maya
100006	E. Guigal 1998 La Mouline (Côte Rôtie)	96	175	Rhône Valley	Côte Rôtie		Roger Voss	@vossroger	Rhône-style Red Blend	E. Guigal	La Mouline
100007	Quilceda Creek 1998 Cabernet Sauvignon (Washington)	95	60	Washington	Washington	Washington Other	Paul Gregutt	@paulgwine	Cabernet Sauvignon	Quilceda Creek	
100008	E. Guigal 1998 La Turque (Côte Rôtie)	95	175	Rhône Valley	Côte Rôtie		Roger Voss	@vossroger	Rhône-style Red Blend	E. Guigal	La Turque
100009	Domaine Jean-Michel Gerin 1999 La Landonne (Côte Rôtie)	95	150	Rhône Valley	Côte Rôtie		Roger Voss	@vossroger	Rhône-style Red Blend	Domaine Jean-Michel Gerin	La Landonn
10001	Herdade dos Machados 2007 Reserva Red (Alentejo)	91	15	Alentejo			Roger Voss	@vossroger	Portuguese Red	Herdade dos Machados	Reserva
100010	Éric & Jöel Durand 1999 Empreintes (Cornas)	95	37	Rhône Valley	Cornas		Roger Voss	@vossroger	Rhône-style Red Blend	Éric & Jöel Durand	Empreintes
100011	E. Guigal 1999 Hermitage	95	55	Rhône Valley	Hermitage		Roger Voss	@vossroger	Rhône-style Red Blend	E. Guigal	
100012	Stag's Leap Wine Cellars 1998 Cask 23 Red (Napa Valley)	95	150	California	Napa Valley	Napa			Bordeaux-style Red Blend	Stag's Leap Wine Cellars	Cask 23
100013	Switchback Ridge 1999 Cabernet Sauvignon (Napa Valley)	95	65	California	Napa Valley	Napa			Cabernet Sauvignon	Switchback Ridge	
100014	Dalla Valle 1999 Cabernet Sauvignon (Napa Valley)	94	100	California	Napa Valley	Napa			Cabernet Sauvignon	Dalla Valle	
100015	Paul Jaboulet Aîné 1999 Chevalier de Sterimberg White (Hermitage)	94	75	Rhône Valley	Hermitage		Roger Voss	@vossroger	Rhône-style White Blend	Paul Jaboulet Aîné	Chevalier d
100016	Paul Jaboulet Aîné 1999 La Chapelle (Hermitage)	94	131	Rhône Valley	Hermitage		Roger Voss	@vossroger	Rhône-style Red Blend	Paul Jaboulet Aîné	La Chapelle

Prédiction du prix d'un vin (Régression)



Prédiction du prix d'un vin (Régression)



Prédiction du prix d'un vin (Régression)

Prédiction du prix d'un vin (Régression)


DEMO

Et ONNX ?


ONNX
OPEN NEURAL NETWORK EXCHANGE FORMAT
The new open ecosystem for interchangeable AI models

Et ONNX ?


ML.NET
ML.NET model
(Trained)
Export
ONNX
Trained model file
Use
Windows ML
(UWP apps on Windows 10
with hardware acceleration)

ONNX en exemple

```
var onnxPath = GetOutputPath(subDir, "SaveModelToOnnxTest.onnx");
var onnxAsJsonPath = GetOutputPath(subDir, "SaveModelToOnnxTest.json");

OnnxConverter converter = new OnnxConverter()
{
    InputsToDrop = new[] { "Label" },
    OutputsToDrop = new[] { "Label", "Features" },
    Onnx = onnxPath,
    Json = onnxAsJsonPath,
    Domain = "com.mydomain"
};

converter.Convert(model);

// Strip the version.
var fileText = File.ReadAllText(onnxAsJsonPath);
fileText = Regex.Replace(fileText, "\"producerVersion\": \"([^\"]+)\"", "\"producerVersion\": \"##VERSION##\"");
File.WriteAllText(onnxAsJsonPath, fileText);
```

ONNX en exemple

LearningModel.LoadFromFilePath(String) Method

Namespace: Windows.AI.MachineLearning

Assemblies: Windows.AI.MachineLearning.dll, Windows.dll

Prerelease. Loads an ONNX model from a file on disk.

Edit

C# Copier

```
public static LearningModel LoadFromFilePath(String filePath)
```

Alternative à ONNX

WriteAsync(String)

Save model to file.

C# Copy

```
public System.Threading.Tasks.Task WriteAsync (string path);
```

ReadAsync(String)

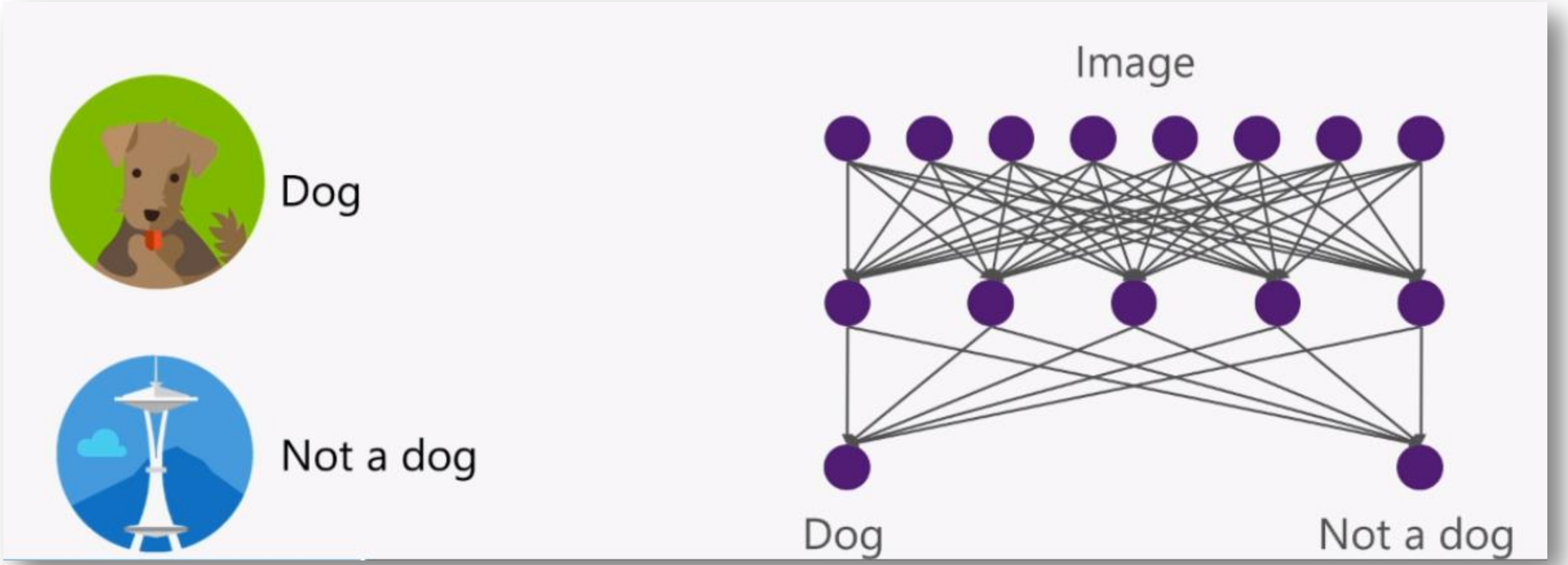
Read model from file asynchronously.

C# Copy

```
public static System.Threading.Tasks.Task<Microsoft.ML.PredictionModel> ReadAsync
(string path);
```


DEMO

Et le Deep Learning dans tout ça ?



Et le Deep Learning dans tout ça ?


DEMO

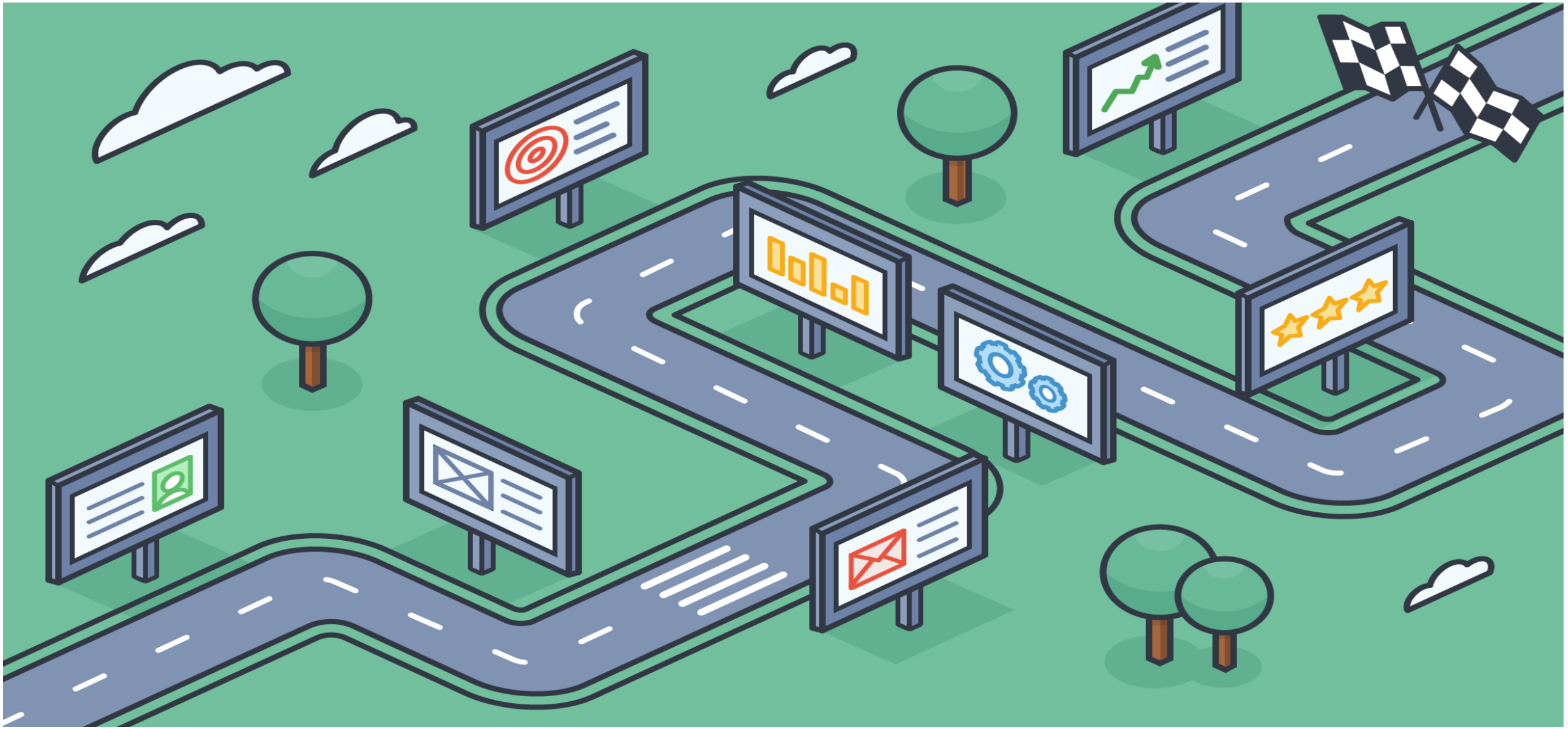
Le future (de l'api) ?

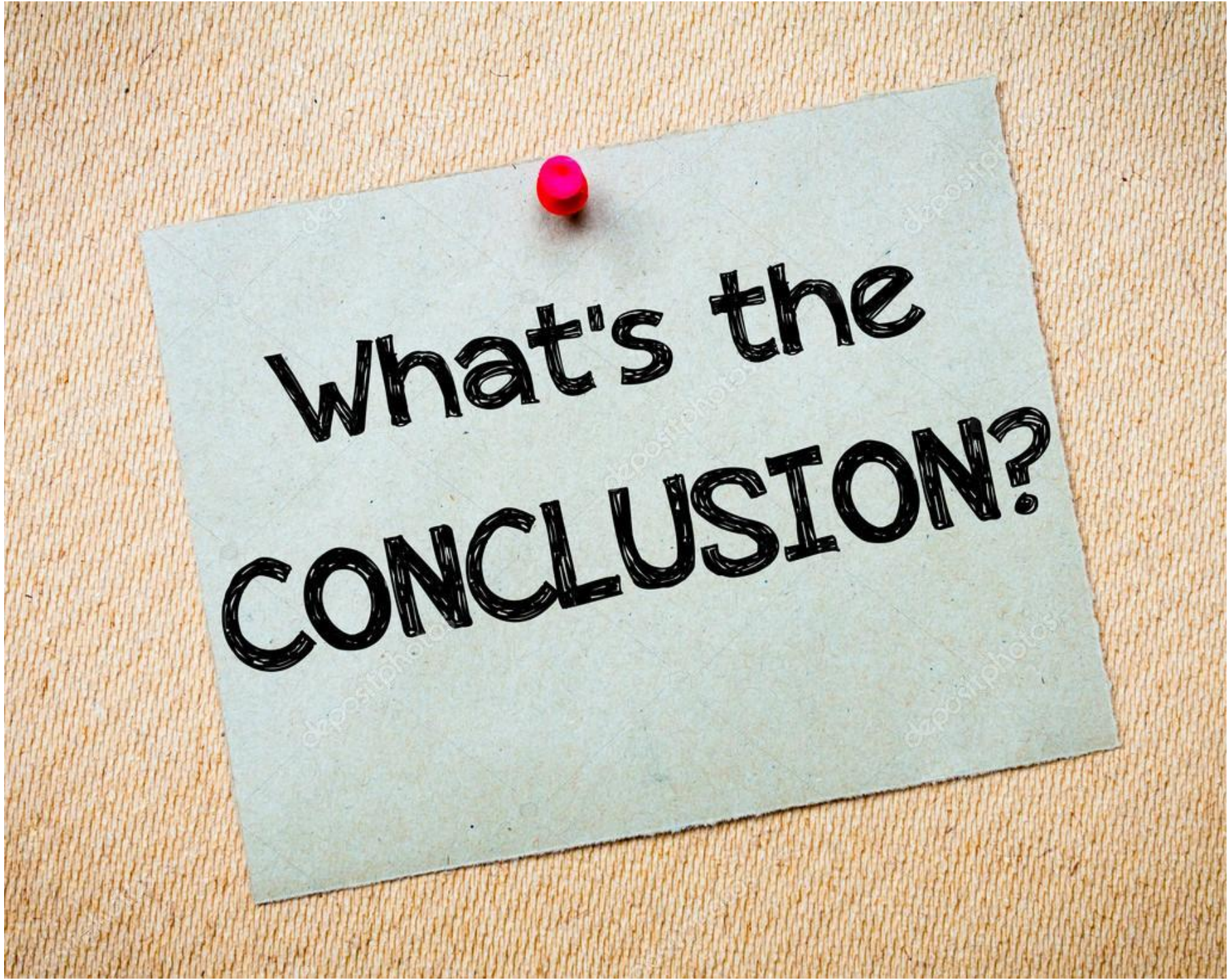
Version 0.6

- Changement du workflow
- Detection automatique du modèle
- Changement des terminologies
- Garder les avantages d'un langage fortement typé


DEMO

ROADMAP




What's the
CONCLUSION?


ANY QUESTIONS
DO YOU HAVE?
memegenerator.net