In partnership with: Microsoft Reactor

.NET Conf 2022

Student Zone

Using ML.NET for machine learning

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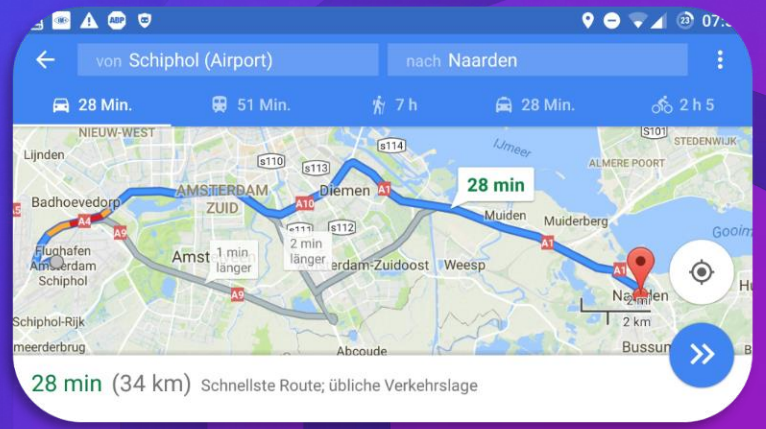
Machine Learning is everywhere

Soon, every applications on every platforms will incorporate some machine learning capabilities, empowering the application and making it smarter.



A Machine Learning problem

Kate wants to buy a new smartphone.
She wishes to calculate how much she needs to save for that.

Navigating the web, she learned that new smartphones prices varies depending on:

Hardware performances

Design and size

Year of production

8 cores, 128 Gb, 6” display, produced in 2022

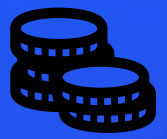
Price > $800

Kate applied Regression

A Machine Learning solution

Data from articles and ads on the web

Training dataset

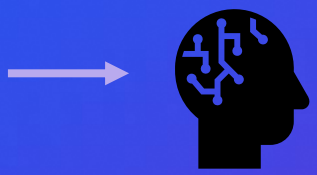


Features

Hardware performances, design, size, year of production

Smartphone price

Label



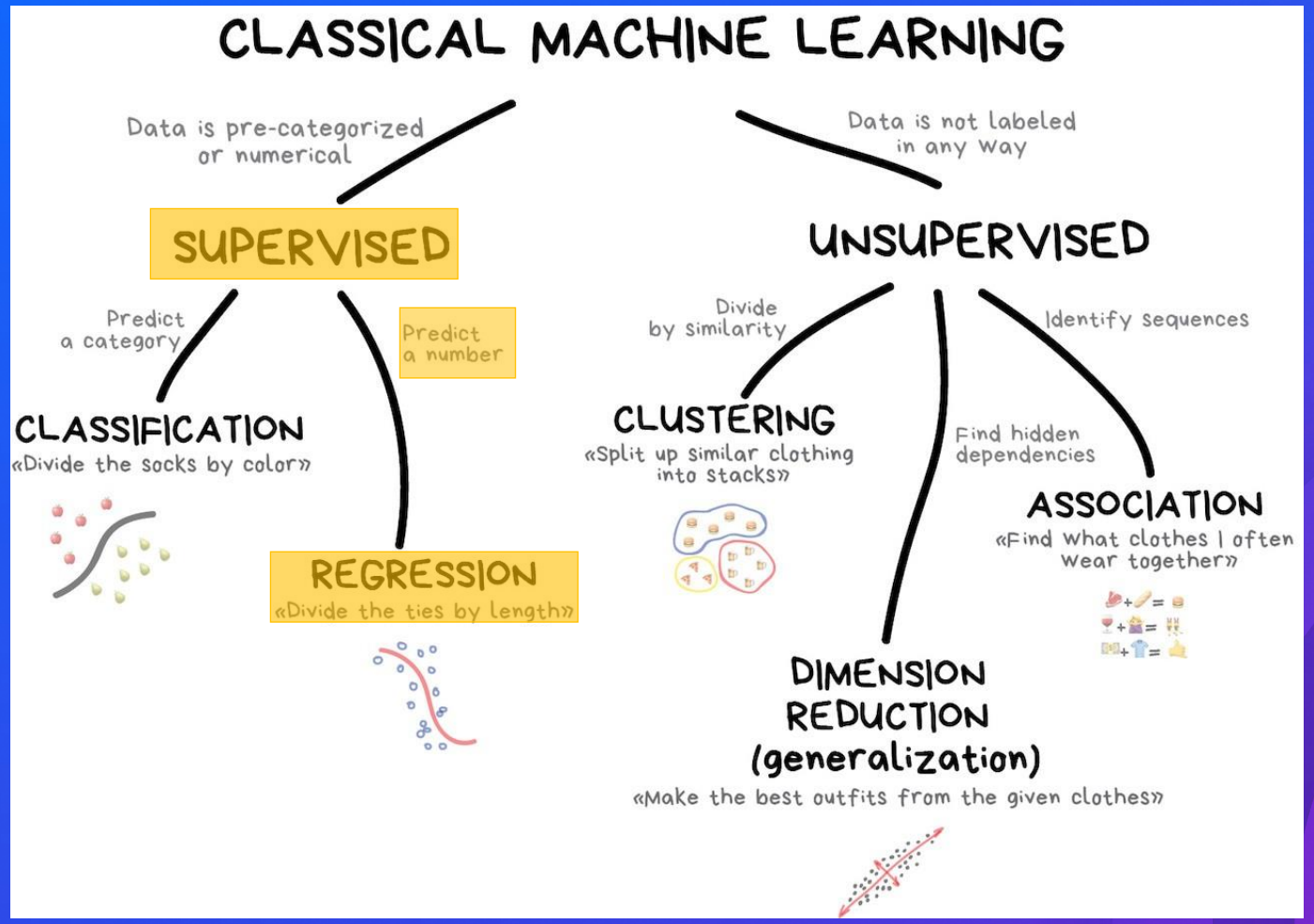
ML model

Training

f(x) = y

A slice of the input dataset – called the test dataset – is hold back for evaluation.

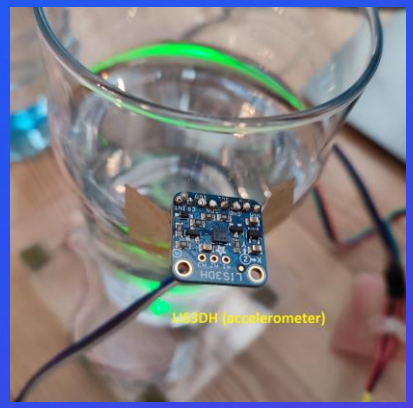
Regression learning

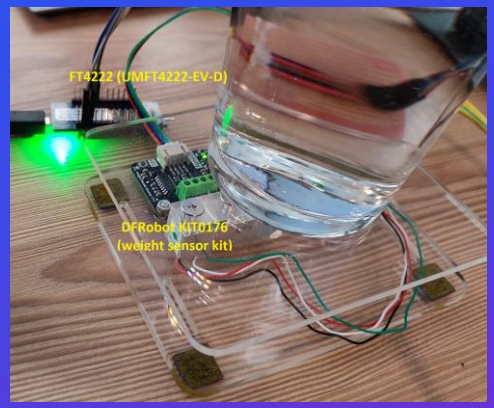


Ilustration credits:
https://vas3k.com/blog/machine_learning/

Our problem: water consumption prediction

Starting from historical data of acceleration measurements, we wish to predict the amount of water (in grams) consumed or refilled in the glass.





ActionId	Time	Window Duration	Avg Acc X	Avg Acc Y	Avg Acc Z	Range Acc X	Range Acc Y	Range Acc Z	Weight
1	10/14/2022 2:47:36 AM	00:00:03.1220000	-0.044	0	1	0.1	0	0	-0.2
2	10/14/2022 2:51:05 AM	00:00:11.1590000	-0.081	0	1.001	0.1	0	0.2	147.7
3	10/15/2022 2:12:05 AM	00:00:08.3540000	0.24	0.018	0.869	1.3	0.4	1.1	0.24

Features

Label

Demo

Use Machine Learning to predict water consumption from acceleration measures

A ML framework for .NET developers

.NET interactive notebooks

Github Codespaces

http://aka.ms/resources-mlnet

Student Resources
http://aka.ms/learnstudent

Cloud Skills Challenge
https://aka.ms/dotnetstudentcsc

GitHub Repo
https://github.com/microsoft/dotnetconf-studentzone