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FOSTERING AI AT SCHOOLS
<http://fosteringai.net>

Numeric recognition and Scratch intro

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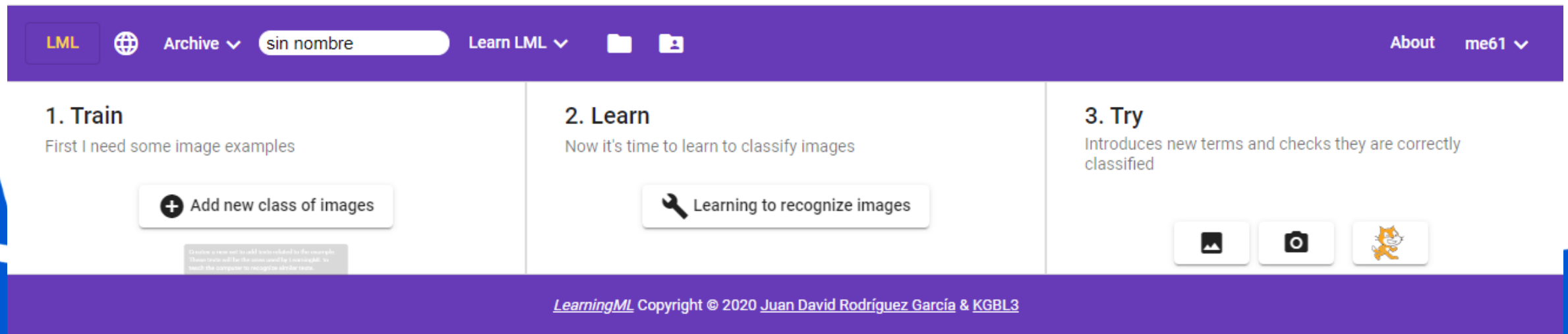


Learning ML

Version 1.2 (stable)

Versión 1.3 (beta)

- **ML:** set of algorithms and techniques
- **Learning ML:** web platform
- **Types of problems:** Text, image and numeric recognition

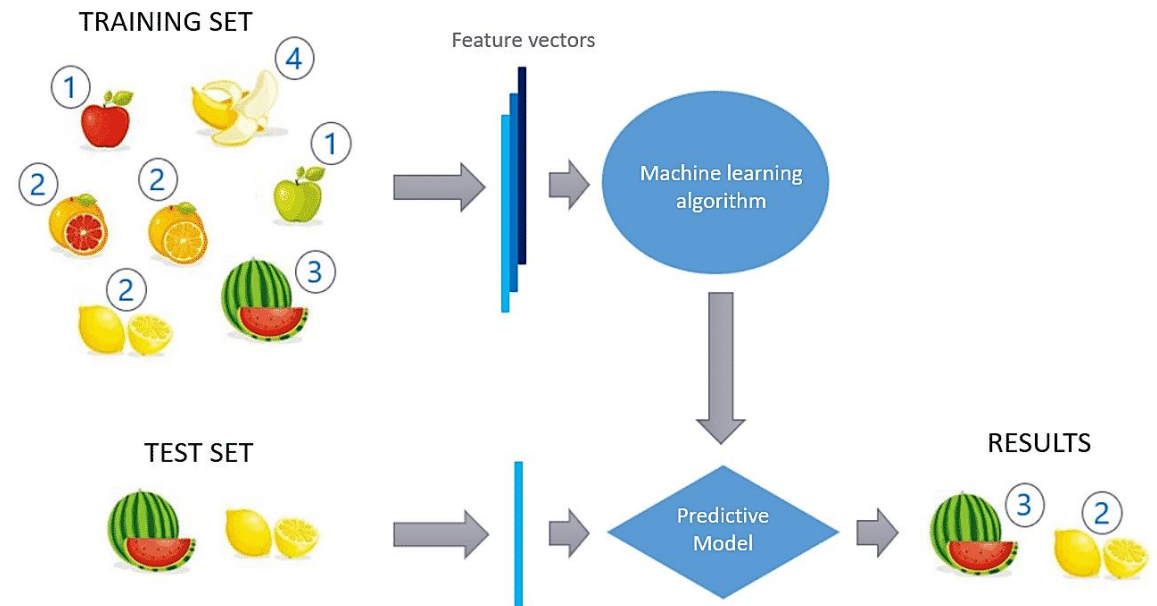




Supervised learning & numeric recognition

Versión 1.3 (beta)

- **Dataset:** each sample is represented with numbers and associated with a label
- **Goal:** using training data (numeric), try to find the labels of testing data (represented by same kind of numbers)

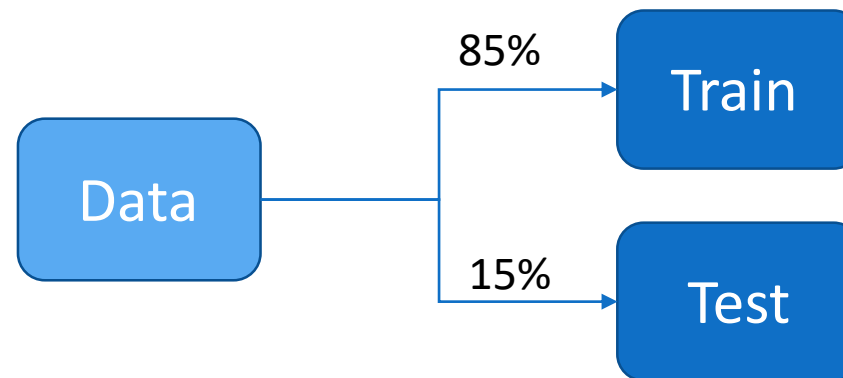




Dataset

Versión 1.3 (beta)

- **Description:** determine the quality of a wine given some numeric parameters
- **Input (11):** fixed acidity, volatile acidity, citric acid...
- **Output:** quality of the wine (3-8)





Exercise: Do it yourselves!

Versión 1.3 (beta)

<https://beta.learningml.org/editor/model/numerical>

LML
Archive
train
Learn LML
Advanced mode on
About
me61

1. Train

First I need some example numbers

Number of columns
11

+ Add new class of numbers

8 (14)

9.4000,0.3000,0.5600,2.8000,0.0800,6.0000,17.0000,0.9964,3.1...

5.5000,0.4900,0.0300,1.8000,0.0440,28.0000,87.0000,0.9908,3...

7.2000,0.3800,0.3100,2.0000,0.0560,15.0000,29.0000,0.9947,3...

5.0000,0.4200,0.2400,2.0000,0.0600,19.0000,50.0000,0.9917,3...

10.7000,0.3500,0.5300,2.6000,0.0700,5.0000,16.0000,0.9972,3...

+ -

7 (142)

10.2000,0.2800,0.4800,2.6000,0.0500,5.0000,12.0000,0.9976,3...

2. Learn

Now is the time to learn to classify numbers

Choose the ML algorithm to build the model
KNN

No. of neighbors 30

Percentage of samples for validation 37

Learning to recognize numbers


Confusion matrix

8	0	0	0	0	0	0
1	1	1	0	3	3	0
6	1	5	47	74	28	4
1	1	12	122	106	20	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0

3. Try

Introduces new terms and checks they are correctly classified

Numbers
8.0,0.31,0.45,2.1,0.216,5.0,16.0,0.99358,3.15,0.81,12.5

Check 

I think it belongs to the class 6, but to be honest, I'm not sure at all

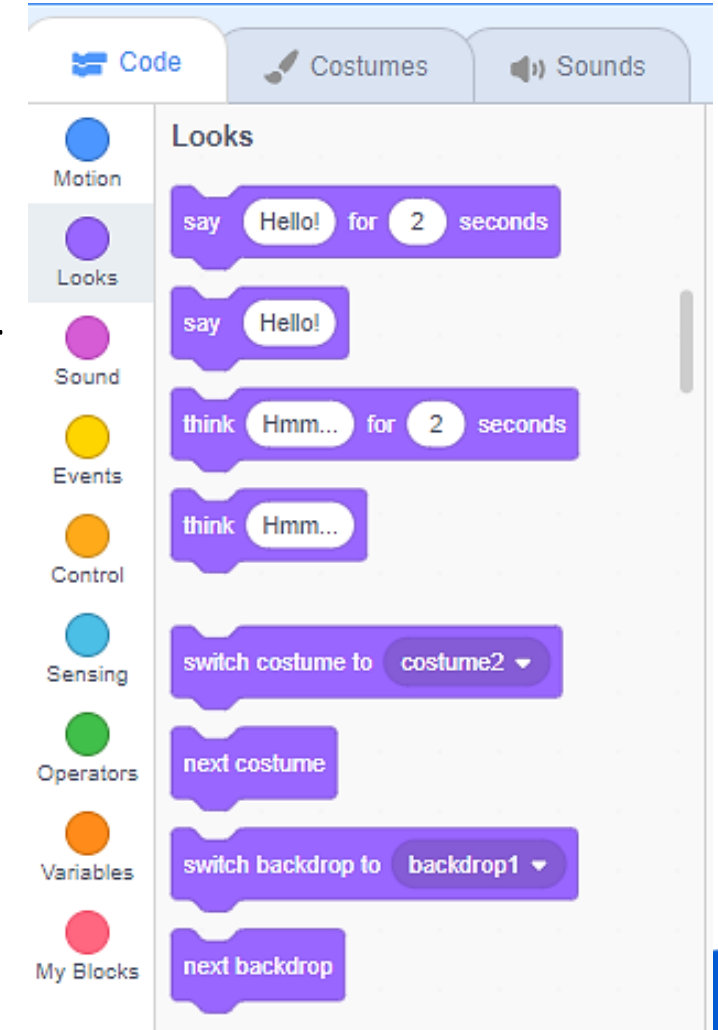
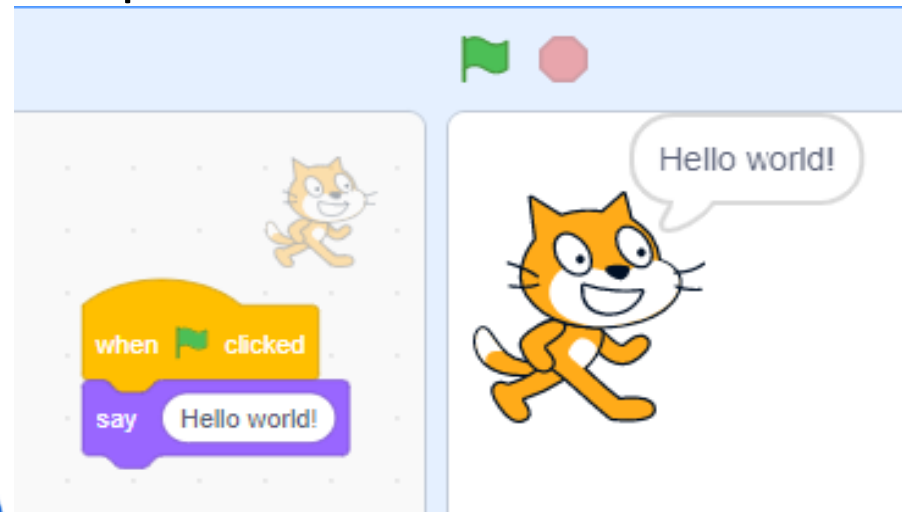
- 6 (40.00 %)
- 5 (36.67 %)
- 4 (10.00 %)
- 7 (10.00 %)
- 8 (3.33 %)
- 3 (0.00 %)

Activar Windows
Ve a Configuración para activar Windows.



Scratch

- **Web tool** It is perfect to introduce computer programming to students, as a previous step to ML
- **Divides programming elements** in blocks
- You can code whatever you can imagine!
 - Introduction to programming for kids
 - Previous step to learn ML





Example: Shark eating fishes

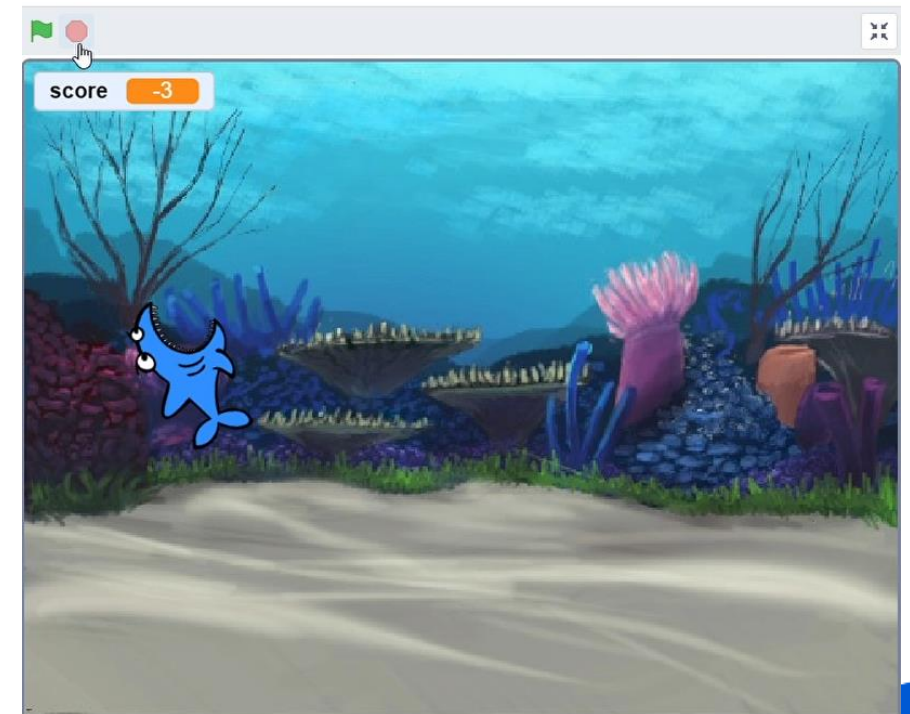
Basic phase

- **Shark:** Follow the mouse
- **If shark eats fishes** we will win 1 point
- **If it eats trash** we lose 1 point
- **Fishes and trash:** Appear at random places

Use ML to identify if it is
trash or fish!

Complex phase

- **Shark when eating :**
 - Change color
 - Open mouth
 - Make a sound



<https://learningml.org/editor/model/image>
Material