



A Dataset of Scratch Programs: Scraped, Shaped and Scored

Efthimia Aivaloglou

[@feniaiv](#)

Felienne Hermans

[@felienne](#)

Jesús Moreno León

[@J_MorenoL](#)

Gregorio Robles

[@gregoriorobles](#)

[Create](#)[Explore](#)[Discuss](#)[About](#)[Help](#)[Search](#)[Join Scratch](#)[Sign in](#)

Create stories, games, and animations

Share with others around the world



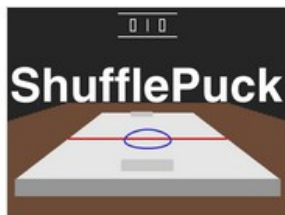
A creative learning community with **21,957,895** projects shared

[ABOUT SCRATCH](#) | [FOR EDUCATORS](#) | [FOR PARENTS](#)

Featured Projects



[WILLOW MAP \[COMPLI\]](#)
TheFarEnd



[Shufflepuck 100% Per](#)
ajzat25



[Protecting The Earth](#)
Infinity-



[Walk around](#)
SzBogi



[Dear Fellow Traveler /](#)
PeppermintFrosty

Scripts

Costumes

Sounds

Remix

See project page

Motion

Looks

Sound

Pen

Data

Events

Control

Sensing

Operators

More Blocks

move 10 steps

turn 15 degrees

turn 15 degrees

point in direction 90

point towards mouse-pointer

go to x: -100 y: 5

go to mouse-pointer

glide 1 secs to x: -100 y: 5

change x by 10

set x to 0

change y by 10

set y to 0

if on edge, bounce

when green flag clicked

switch costume to fish - open

forever

if distance to mouse-pointer > 10 then

point towards mouse-pointer

move 5 steps

when I receive got-me

play sound chomp

repeat 2

switch costume to fish - closed

wait 0.3 secs

switch costume to fish - open

Sprite

Sprites

New sprite:



hungry fish



little fish

Stage
3 backdrops

New backdrop:

x: -100
y: 4

Scripts

Costumes

Sounds

Remix

See project page

Motion

Looks

Sound

Pen

Data

Events

Control

Sensing

Operators

More Blocks

move 10 steps

turn 15 degrees

turn 15 degrees

point in direction 90

point towards mouse-pointer

go to x: -100 y: 5

go to mouse-pointer

glide 1 secs to x: -100 y: 5

change x by 10

set x to 0

change y by 10

set y to 0

if on edge, bounce

when green flag clicked

switch costume to fish - open

forever

if distance to mouse-pointer > 10 then

point towards mouse-pointer

move 5 steps

when I receive got-me

play sound chomp

repeat 2

switch costume to fish - closed

wait 0.3 secs

switch costume to fish - open

Scripts

Sprites

New sprite:    Stage
3 backdrops

hungry fish

little fish

New backdrop:



Scratch

File Edit Tips About

Fish Chomp - Starter Project
by mchung

Scripts

Costumes

Sounds

Remix

See project page

Categories

Motion
Looks
Sound
Pen
Data

Events
Control
Sensing
Operators
More Blocks

move 10 steps
turn 15 degrees
turn 15 degrees

point in direction 90
point towards mouse-pointer

go to x: -100 y: 5
go to mouse-pointer
glide 1 secs to x: -100 y: 5

change x by 10
set x to 0
change y by 10
set y to 0

if on edge, bounce

when green flag clicked

switch costume to fish - open

forever

if distance to mouse-pointer > 10 then
point towards mouse-pointer
move 5 steps

when I receive got-me

play sound chomp

repeat 2

switch costume to fish - closed
wait 0.3 secs
switch costume to fish - open



x: -100
y: 4

Sprites

New sprite:



Stage
3 backdrops

New backdrop:



hungry fish



little fish

Blocks

Scratch Statistics - Imagin... X +

← ⓘ https://scratch.mit.edu/statistics/ ↻

SCRATCH Create Explore Discuss About Help Search Join Scratch Sign in

Community statistics at a glance

- 🐱 21,955,172 projects shared,
- 🐱 18,062,529 users registered,
- 🐱 112,032,203 comments posted,
- 🐱 3,401,566 studios created

...and growing!

Website traffic last month

- 🐱 195,958,590 pageviews
- 🐱 38,257,450 visits
- 🐱 19,668,840 unique visitors

i

The image shows the Scratch website interface. At the top, there's a navigation bar with links: "Scratch - Explore", "Create", "Explore", "Discuss", "About", "Help", and a search icon. Below this is a large yellow banner with the word "Explore" in white. At the bottom, there are two icons: "Projects" (a green flag) and "Studios" (a folder icon).

Scrape

JSON files of 250K projects

Parse

A	B	C	D	E	F	G	H
10519701	68-60		0 sprite	Sprite3		1	0 whenIReceive
10519701	68-60		0 sprite	Sprite3		1	1 say:duration:el
10519701	68-60						st
10519701	108-1						ation:ed:from:
10519701	108-1						psed:from:
10519701	108-1						time
10519701	129-121		2 sprite	Sprite1		1	0 whenGreenFlag
10519701	129-121		2 sprite	Sprite1		1	1 broadcast:
10541430	22-17		0 stage	stage		1	0 whenGreenFlag
10541430	22-17		0 stage	stage		1	1 setVar:to:
10541430	22-17		0 stage	stage		3	3 changeVar:by:
10541430	22-17		0 stage	stage		1	2 doForever
10541430	21-14		1 sprite	Tree_3		1	0 whenGreenFlag
10541430	21-14		1 sprite	Tree_3		1	1 show
10541430	21-14		1 sprite	Tree_3		1	2 goBackBy:layers:

A Dataset of Scratch Programs:

Scraped, Shaped and Scored

Scratch web interface

Scrape

Available for download!

Parse

Available for download!

```
"objName": "Sprite3",
"scripts": [[81,
  51,
  [[["whenGreenFlag"]
    119,
    212,
    [[["whenIReceive"]
      376,
      2
      227,
      ["whenCloned"],
      ["show"],
      ["doUntil", ["touching:", "_edge_"], [{"changeXposBy:", -3}],
      ["hide"]]]],
```

A	B	C	D	E	F	G	H
10519701	68-60				1	0	whenIReceive
10519701	68-60				1	1	say:duration:lan
10519701	68-60						st:
10519701	108-1						ec
10519701	108-7						ation.cand:from:
10519701	108						psed:from:
10519701	108						tume
10519701	12					0	whenGreenFlag
10519701	129					1	broadcast:
10541430	22-					0	whenGreenFlag
10541430	22-17					1	setVar:to:
10541430	22-17				3	3	changeVar:by:
10541430	22-17					2	doForever
10541430	21-14				1	0	whenGreenFlag
10541430	21-14					1	show
10541430	21-14					2	goBackByLayers:

A	B	C	D	E	F	G	H
10519701	68-60	0	sprite	Sprite3	1	0	whenIReceive
10519701	68-60	0	sprite	Sprite3	1	1	say:duration:elapsed:from:
10519701	68-60	0	sprite	Sprite3	1	2	broadcast:
10519701	108-143	1	sprite	Sprite4	1	0	whenIReceive
10519701	108-143	1	sprite	Sprite4	1	1	say:duration:elapsed:from:
10519701	108-143	1	sprite	Sprite4	1	2	wait:elapsed:from:
10519701	108-143	1	sprite	Sprite4	1	3	nextCostume
10519701	129-121	2	sprite	Sprite1	1	0	whenGreenFlag
10519701	129-121	2	sprite	Sprite1	1	1	broadcast:
10541430	22-17	0	stage	stage	1	0	whenGreenFlag
10541430	22-17						
10541430	22-17						
10541430	22-17						
10541430	21-14						
10541430	21-14						
10541430	21-14						
10541430	21-14	1	sprite	Tree_3	1	2	goBackByLayers:

CSV files of 247K projects

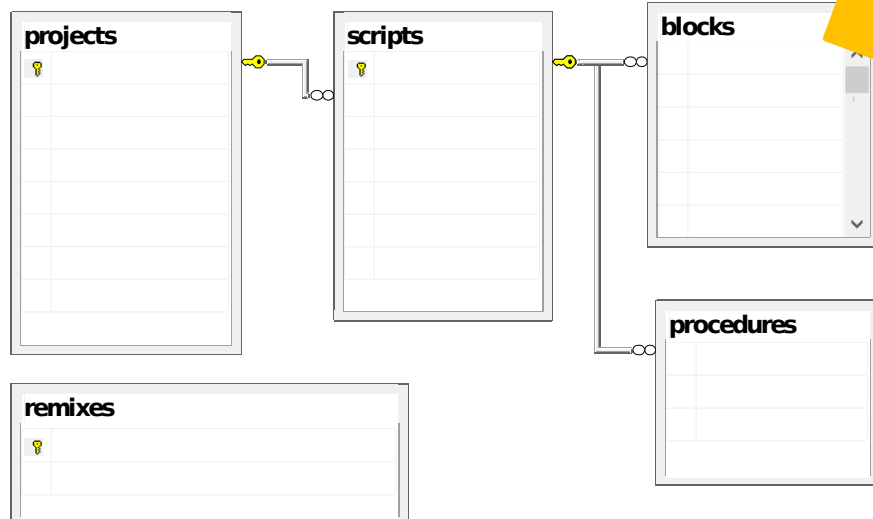
A Dataset of Scratch Programs:

Scraped, **Shaped** and Scored

Import

Database

Shape



A	B	C	D	E	F	G	H
10519701	68-60	0	sprite	Sprite3	1	0	whenIReceive
10519701	68-60	0	sprite	Sprite3	1	1	say:duration:elapsed:from:
10519701	68-60	0	sprite	Sprite3	1	2	broadcast:
10519701	108-143	1	sprite	Sprite4	1	0	whenIReceive
10519701	108-143	1	sprite	Sprite4	1	1	say:duration:elapsed:from:
10519701	108-143	1	sprite	Sprite4	1	2	wait:elapsed:from:
10519701	108-143	1	sprite	Sprite4	1	3	nextCostume
10519701	129-121	2	sprite	Sprite1	1	0	whenGreenFlag
10519701	129-121	2	sprite	Sprite1	1	1	broadcast:
10541430	22-17	0	stage	stage	1	0	whenGreenFlag
10541430	22-17						
10541430	22-17						
10541430	22-17						
10541430	21-14						
10541430	21-14						
10541430	21-14						
10541430	21-14	1	sprite	Tree_3	1	2	goBackByLayers:

CSV files of 247K projects

A Dataset of Scratch Programs:

Scraped, **Shaped** and Scored

Import

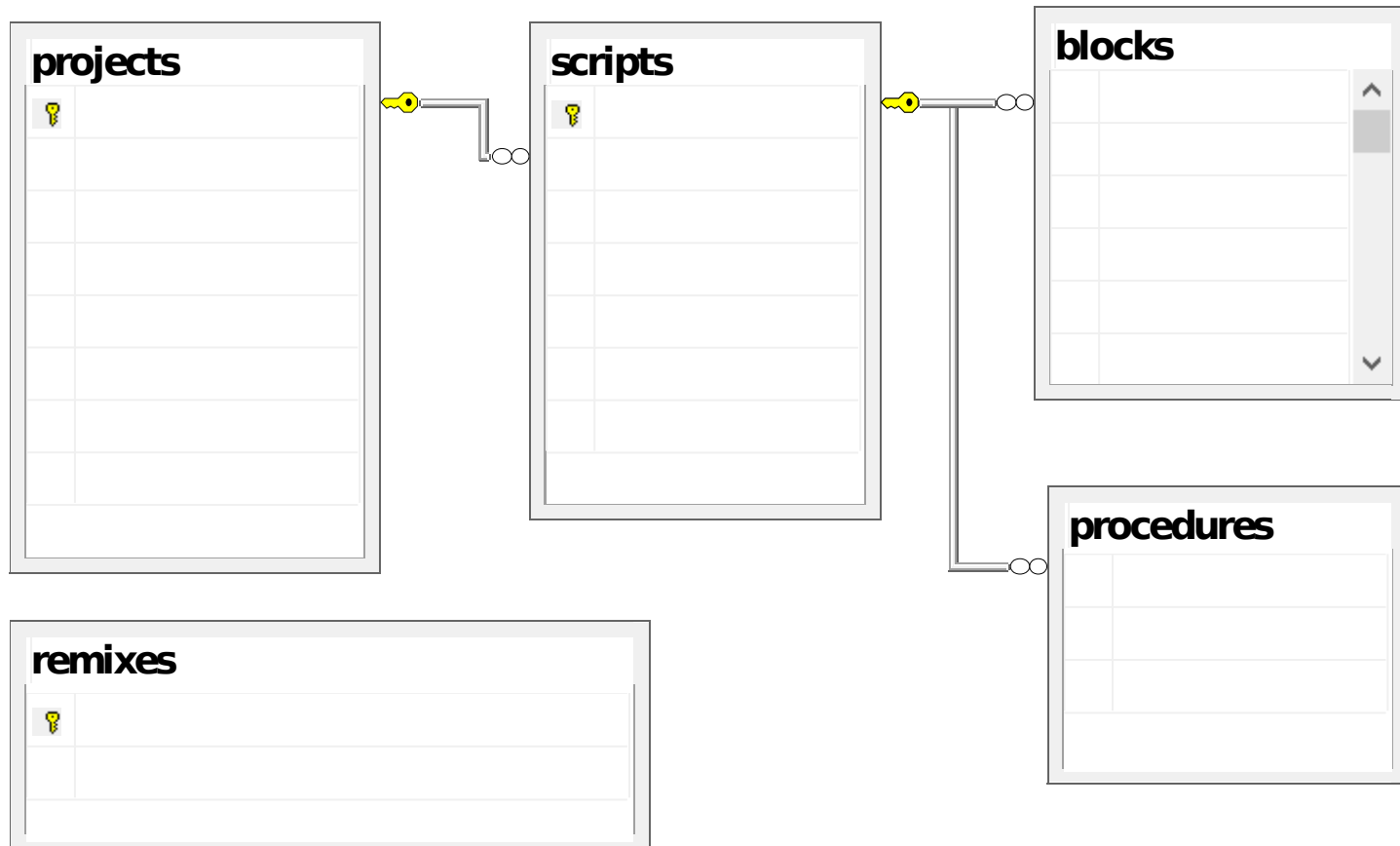
Database

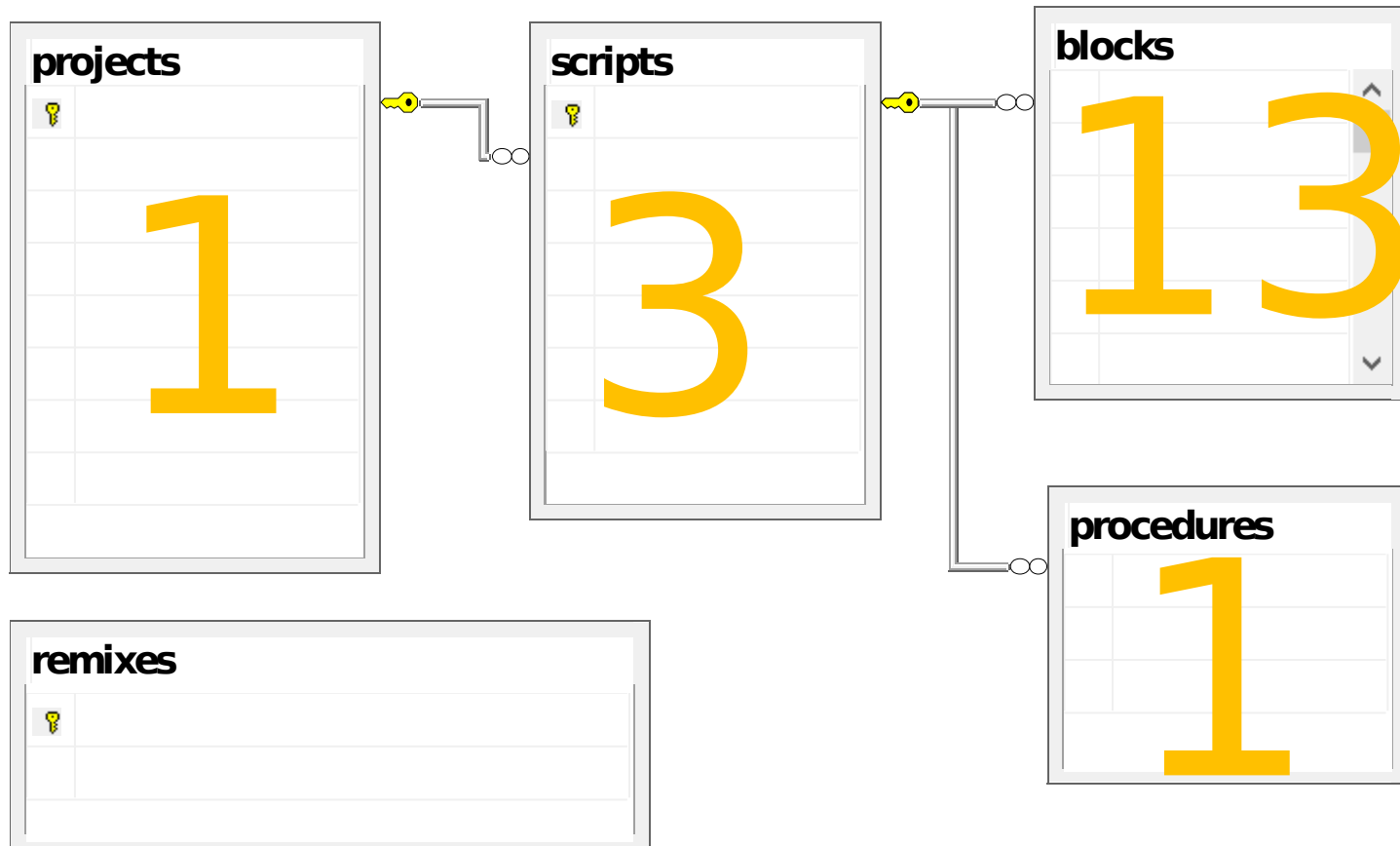
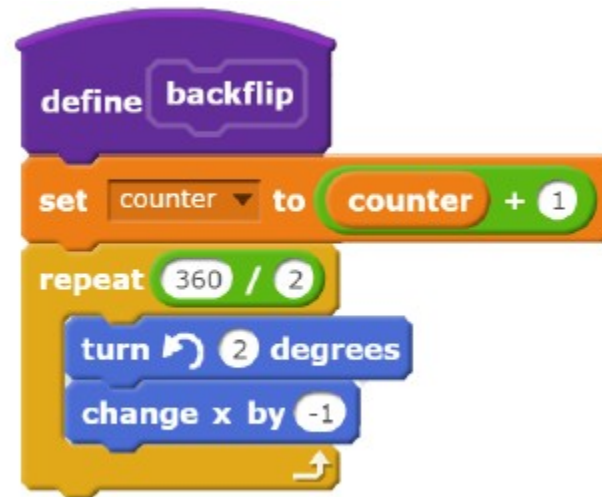
Shape

Available for download!

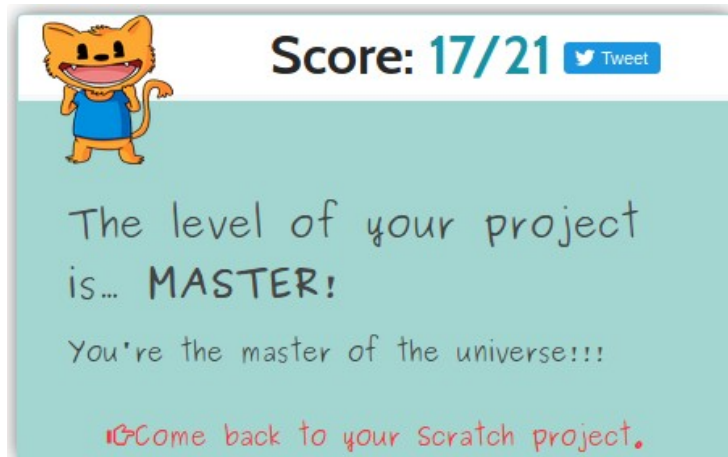


An example of what you get:





A Dataset of Scratch Programs: Scraped, Shaped and **Scored**



grades	
Level up	Level
Flow control	<div><div></div>2/3</div>
Data representation	<div><div></div>2/3</div>
Abstraction	<div><div></div>3/3</div>
User interactivity	<div><div></div>2/3</div>
Synchronization	<div><div></div>2/3</div>
Parallelism	<div><div></div>3/3</div>
Logic	<div><div></div>3/3</div>


```

"objName": "Sprite3",
"scripts": [[81,
  51,
  [[["whenGreenFlag", ["createCloneOf", "_myself_"], [{"gotoXy": -179, 134}, {"hide"}]],
  [119,
  212,
  [[["whenIReceive", "fly"],
    {"doRepeat",
      20,
      [[["gotoXy": -179, 134],
        {"call", "random costume"}],
      276.9,
      [{"procDef", "random costume", [], [], false}, {"lookLike": [{"randomFrom": to: 1, 4}]]],
  [227,
  483,
  [[["whenCloned",
    {"show"},
    {"doUntil", [{"touching": "_edge_"}, [{"changeXposBy": -3}]],
    {"hide"}]]],

```

JSON



A	B	C	D	E	F	G	H
10519701	68-60	0	sprite	Sprite3	1	0	whenIReceive
10519701	68-60	0	sprite	Sprite3	1	1	say:duration:elapsed:from:
10519701	68-60	0	sprite	Sprite3	1	2	broadcast:
10519701	108-143	1	sprite	Sprite4	1	0	whenIReceive
10519701	108-143	1	sprite	Sprite4	1	1	say:duration:elapsed:from:
10519701	108-143						elapsed:from:
10519701	108-143						costume
10519701	129-121						whenGreenFlag
10519701	129-121						cast:
10541430	22-17						whenGreenFlag
10541430	22-17	0	stage	stage	1	1	setVar:to:
10541430	22-17	0	stage	stage	3	3	changeVar:by:
10541430	22-17	0	stage	stage	1	2	doForever
10541430	21-14	1	sprite	Tree_3	1	0	whenGreenFlag
10541430	21-14	1	sprite	Tree_3	1	1	show
10541430	21-14	1	sprite	Tree_3	1	2	goBackByLayers:

CSV

250K projects
110K users
4M scripts
204K custom blocks
36M blocks

github.com/TUDELFTScratchLab/ScratchDataset

Can be used for ...

- assessing the programming skills that learners develop in Scratch
 - do they really learn? What?
- quality assessment & smell detection
 - any bad programming habits?
- examining the learning progressions of novices
 - does remixing/experience/xyz help?

```

"objName": "Sprite3",
"scripts": [[81,
  51,
  [[["whenGreenFlag", ["createCloneOf", "_myself_"], [{"gotoXy": -179, 134}, {"hide"}]],
  [119,
  212,
  [[["whenIReceive", "fly"],
    {"doRepeat",
      20,
      [[["gotoXy": -179, 134],
        {"call", "random costume"}],
      276.9,
      [{"procDef", "random costume", [], [], false}, {"lookLike": [{"randomFrom": to: 1, 4}]]],
  [227,
  483,
  [[["whenCloned",
    {"show"},
    {"doUntil", [{"touching": "_edge_"}, [{"changeXposBy": -3}]],
    {"hide"}]]],

```

JSON



A	B	C	D	E	F	G	H
10519701	68-60	0	sprite	Sprite3	1	0	whenIReceive
10519701	68-60	0	sprite	Sprite3	1	1	say:duration:elapsed:from:
10519701	68-60	0	sprite	Sprite3	1	2	broadcast:
10519701	108-143	1	sprite	Sprite4	1	0	whenIReceive
10519701	108-143	1	sprite	Sprite4	1	1	say:duration:elapsed:from:
10519701	108-143						elapsed:from:
10519701	108-143						costume
10519701	129-121						whenGreenFlag
10519701	129-121						cast:
10541430	22-17						whenGreenFlag
10541430	22-17	0	stage	stage	1	1	setVar:to:
10541430	22-17	0	stage	stage	3	3	changeVar:by:
10541430	22-17	0	stage	stage	1	2	doForever
10541430	21-14	1	sprite	Tree_3	1	0	whenGreenFlag
10541430	21-14	1	sprite	Tree_3	1	1	show
10541430	21-14	1	sprite	Tree_3	1	2	goBackByLayers:

CSV

250K projects
110K users
4M scripts
204K custom blocks
36M blocks

github.com/TUDELFTScratchLab/ScratchDataset



A Dataset of Scratch Programs: Scraped, Shaped and Scored

Efthimia Aivaloglou

[@feniaiv](#)

Felienne Hermans

[@felienne](#)

Jesús Moreno León

[@J_MorenoL](#)

Gregorio Robles

[@gregoriorobles](#)