



Stichting NIOC en de NIOC kennisbank

Stichting NIOC (www.nioc.nl) stelt zich conform zijn statuten tot doel: het realiseren van congressen over informatica onderwijs en voorts al hetgeen met een en ander rechtstreeks of zijdelings verband houdt of daartoe bevorderlijk kan zijn, alles in de ruimste zin des woords.

De stichting NIOC neemt de archivering van de resultaten van de congressen voor zijn rekening. De website www.nioc.nl ontsluit onder "Eerdere congressen" de gearchiveerde websites van eerdere congressen. De vele afzonderlijke congresbijdragen zijn opgenomen in een kennisbank die via dezelfde website onder "NIOC kennisbank" ontsloten wordt.

Op dit moment bevat de NIOC kennisbank alle bijdragen, incl. die van het laatste congres (NIOC2025, gehouden op donderdag 27 maart 2025 jl. en georganiseerd door Hogeschool Windesheim). Bij elkaar zo'n 1500 bijdragen!

We roepen je op, na het lezen van het document dat door jou is gedownload, de auteur(s) feedback te geven. Dit kan door je te registreren als gebruiker van de NIOC kennisbank. Na registratie krijg je bericht hoe in te loggen op de NIOC kennisbank.

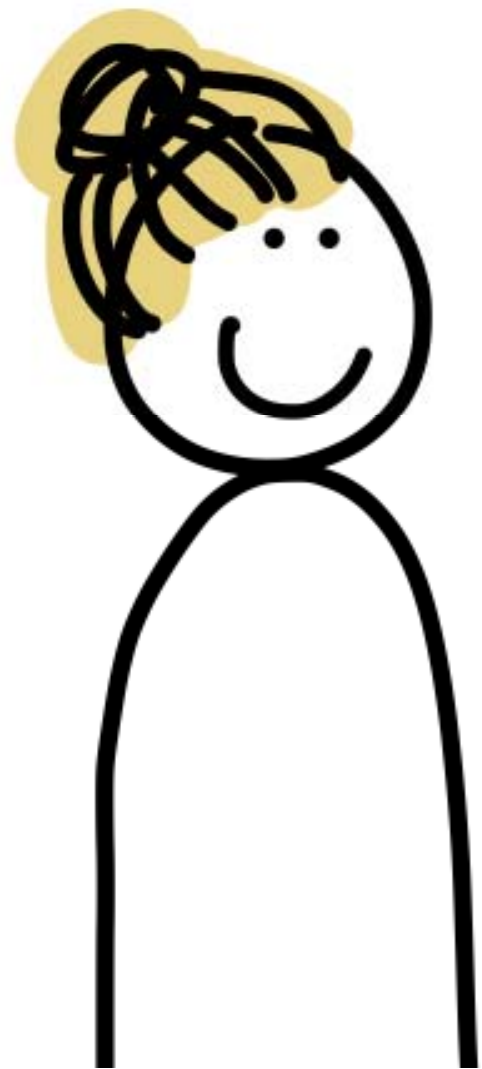
Het eerstvolgende NIOC vindt plaats op 18 maart 2027 in Arnhem en wordt georganiseerd door HAN University of Applied Sciences.

Reacties over de NIOC kennisbank en de inhoud daarvan kun je richten aan de beheerder:

R. Smedinga kennisbank@nioc.nl.

Vermeld bij reacties jouw naam en telefoonnummer voor nader contact.

What is programming?

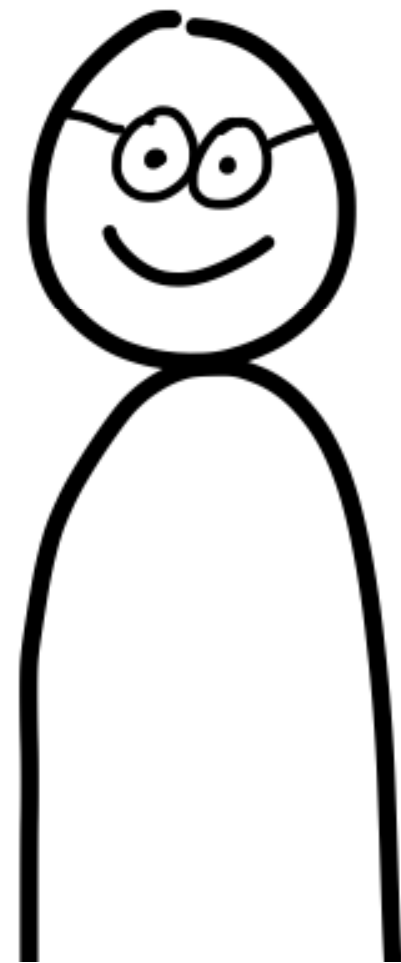


Felienne

"Everyone should
learn programming"

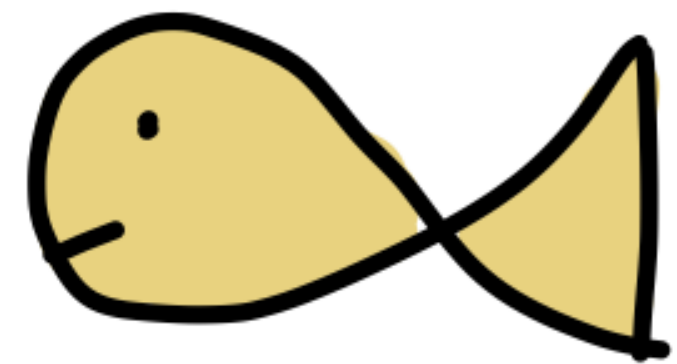
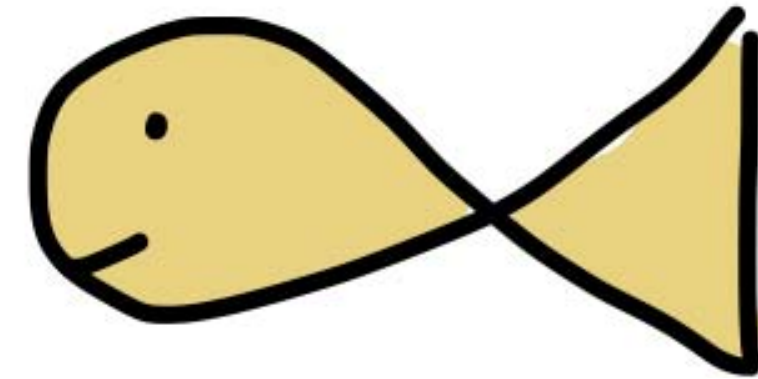
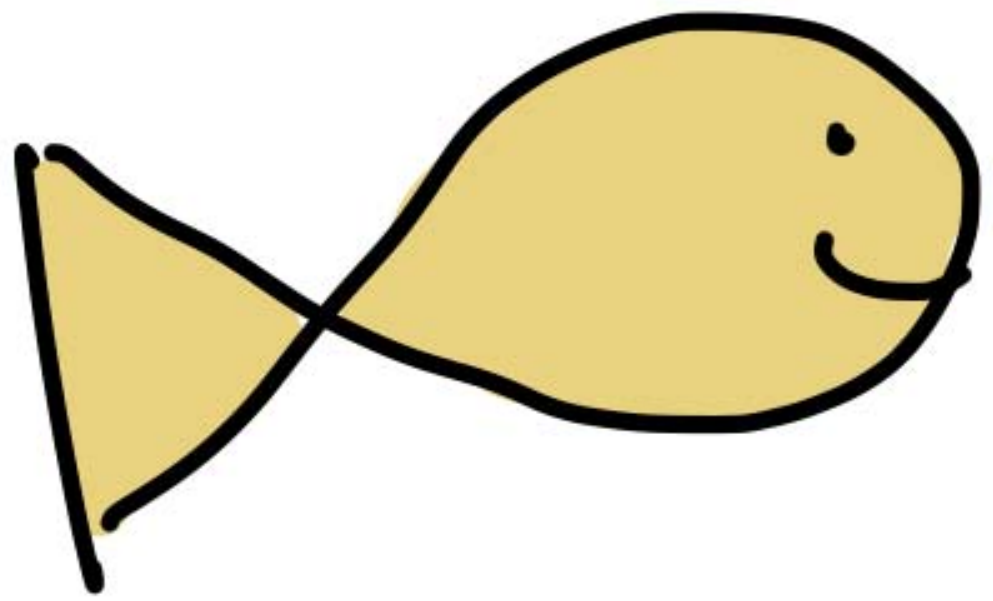


"Everyone should
learn programming"

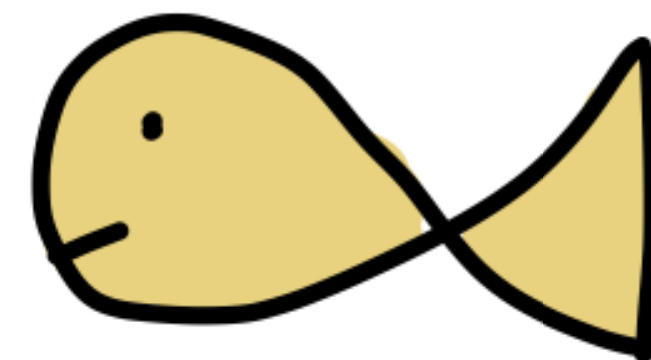
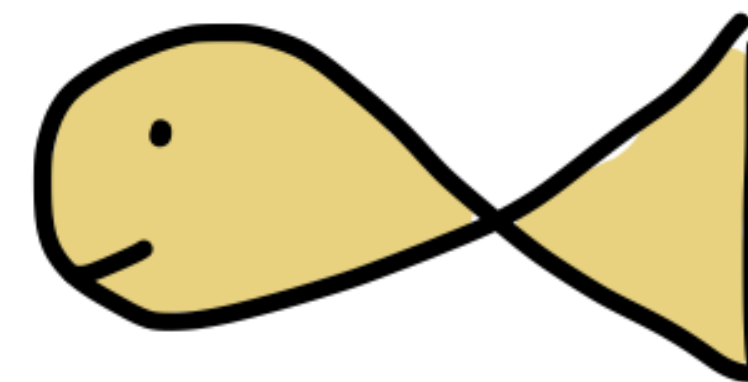
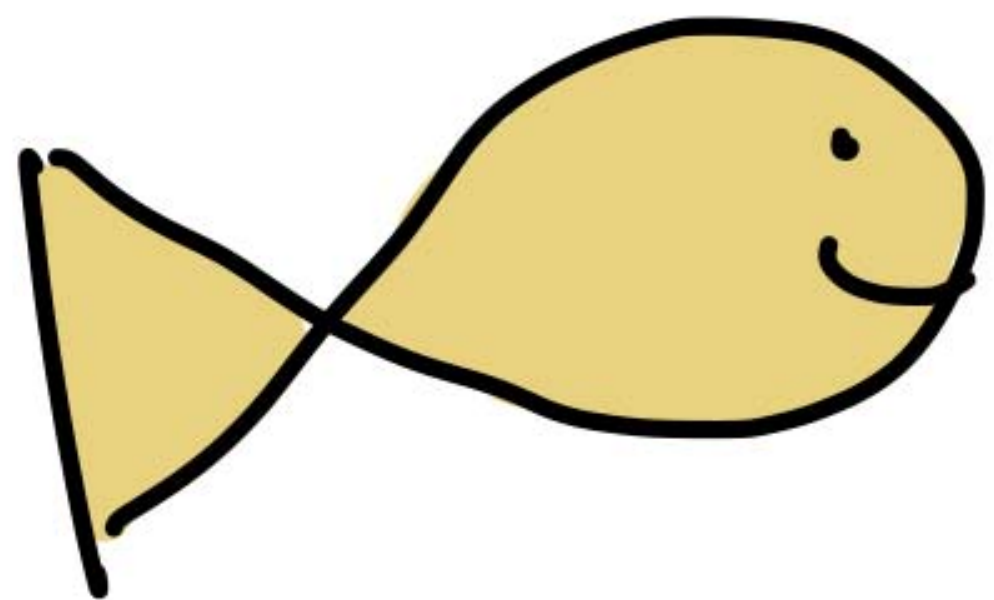


- Every programmer ever

What is programming?

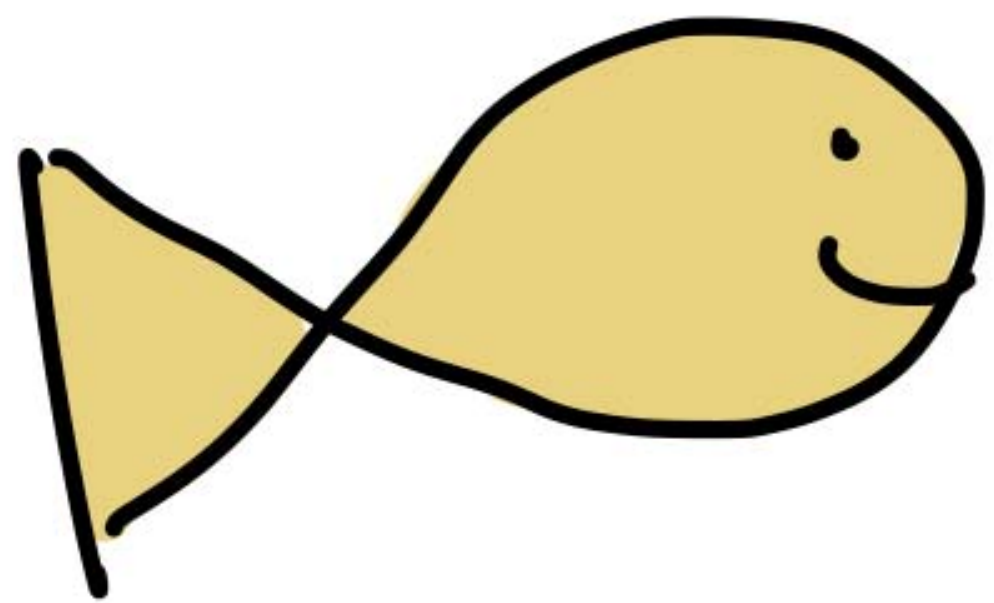


Hey folks!
How's the water?

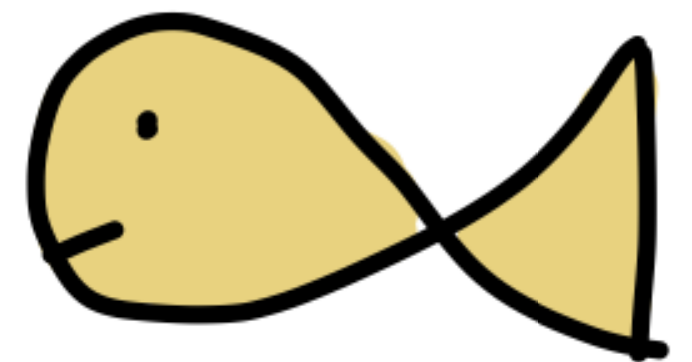
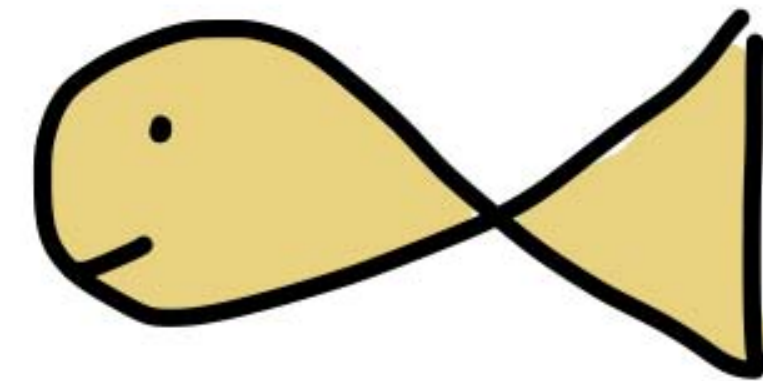


Hey folks!

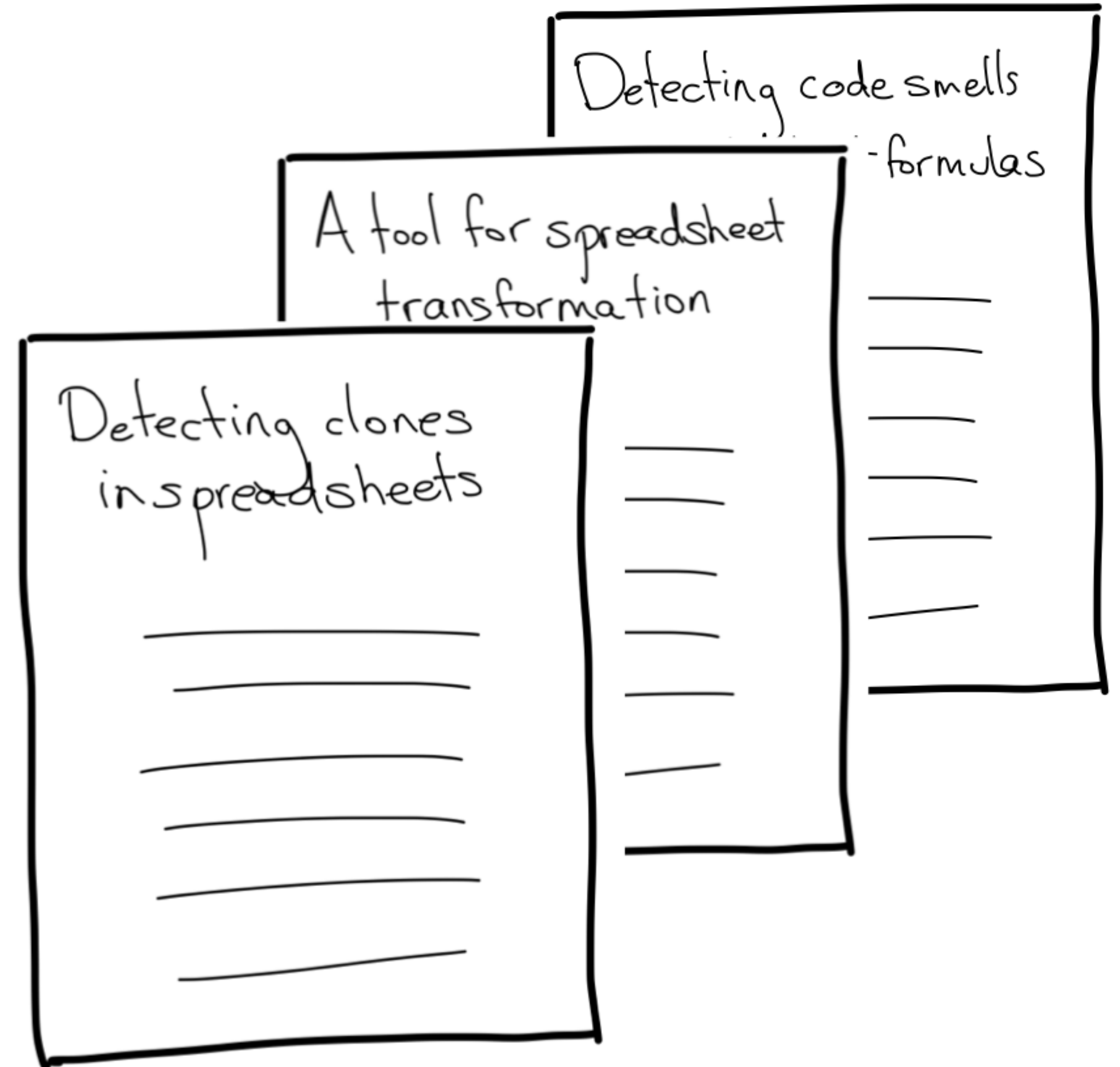
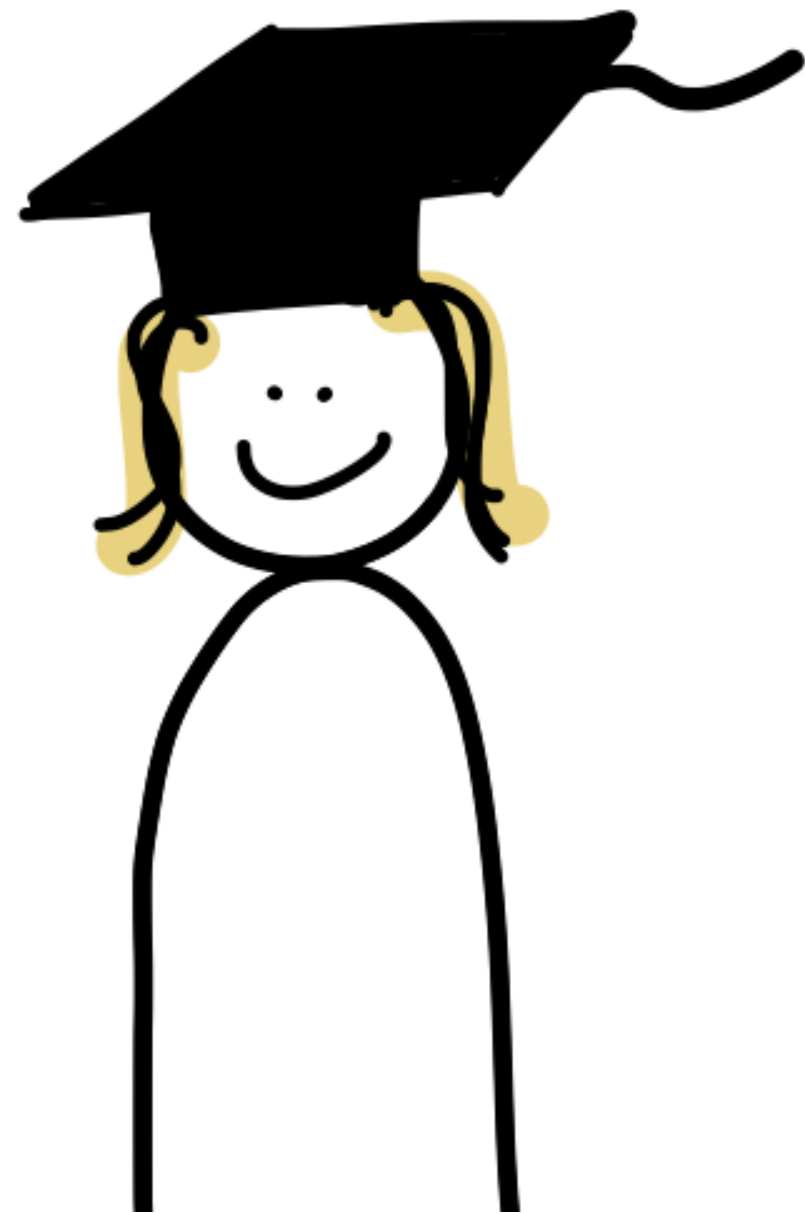
How's the water?



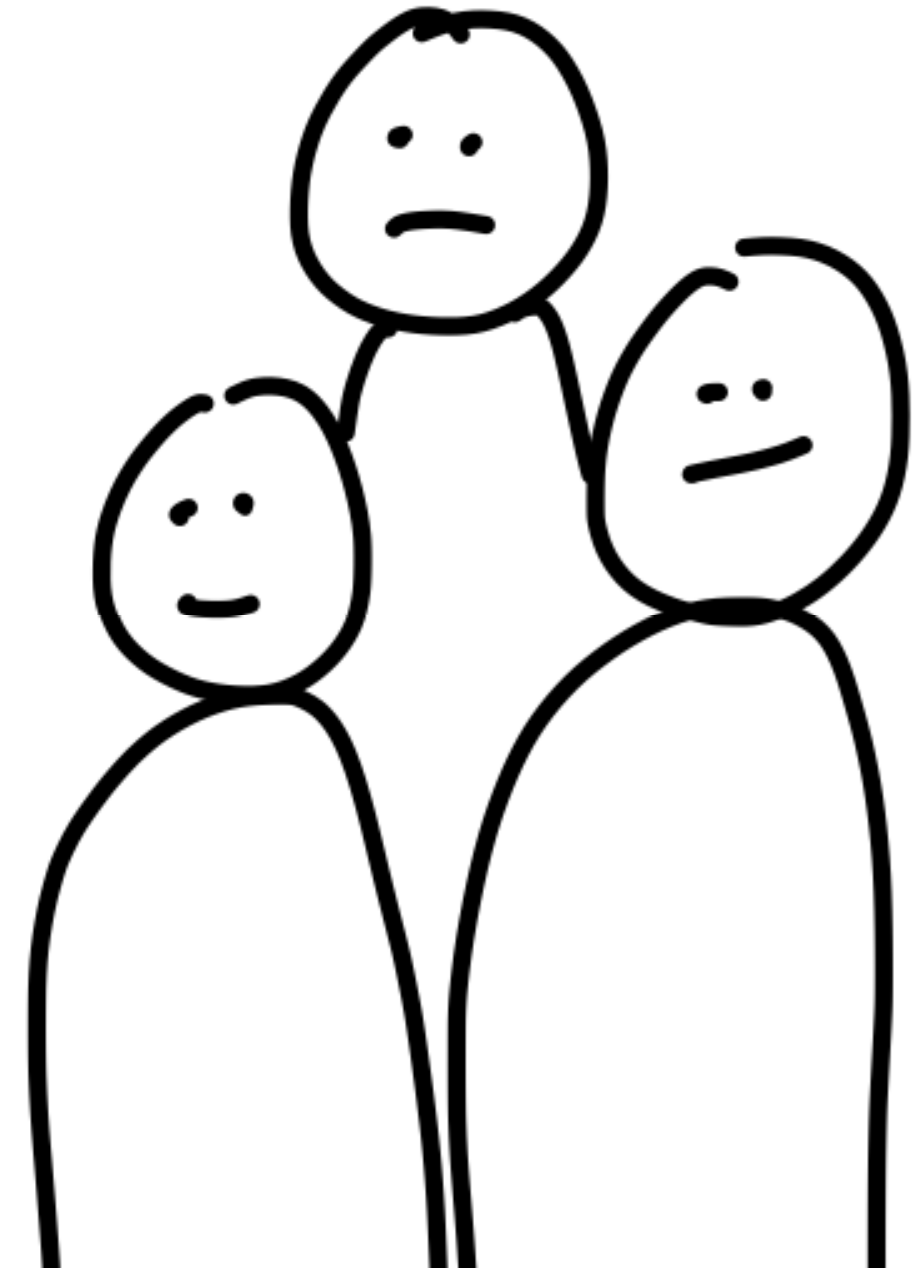
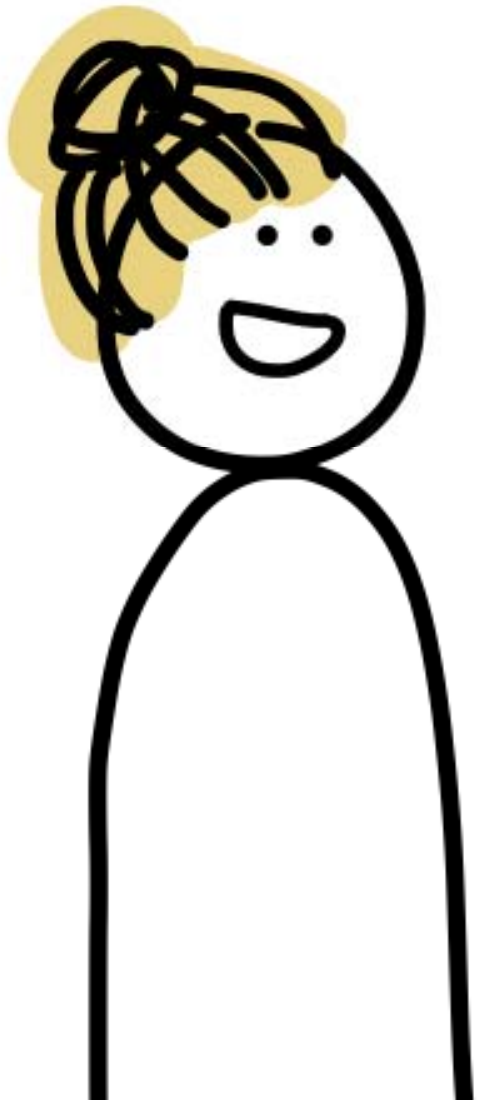
What's water?



Spreadsheets are code

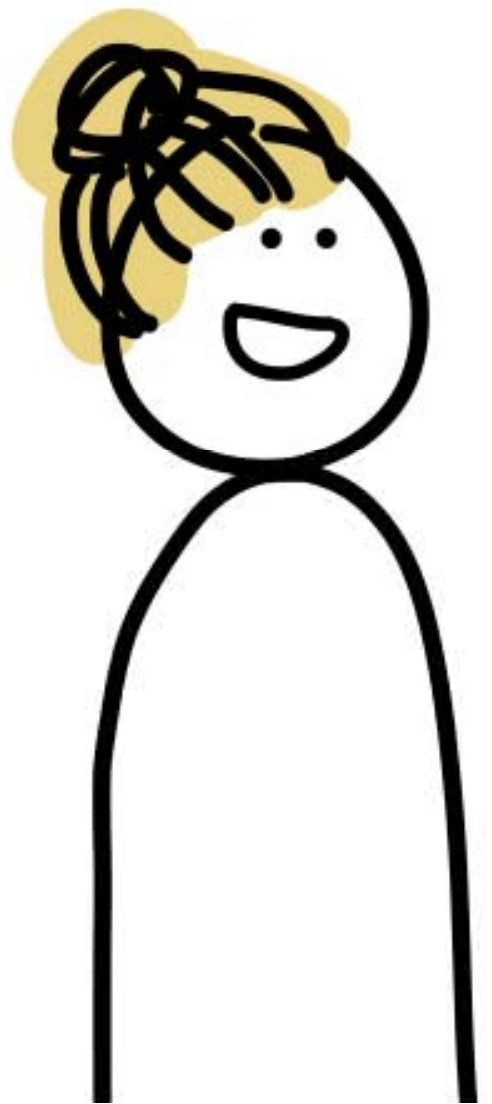


Spreadsheets are code

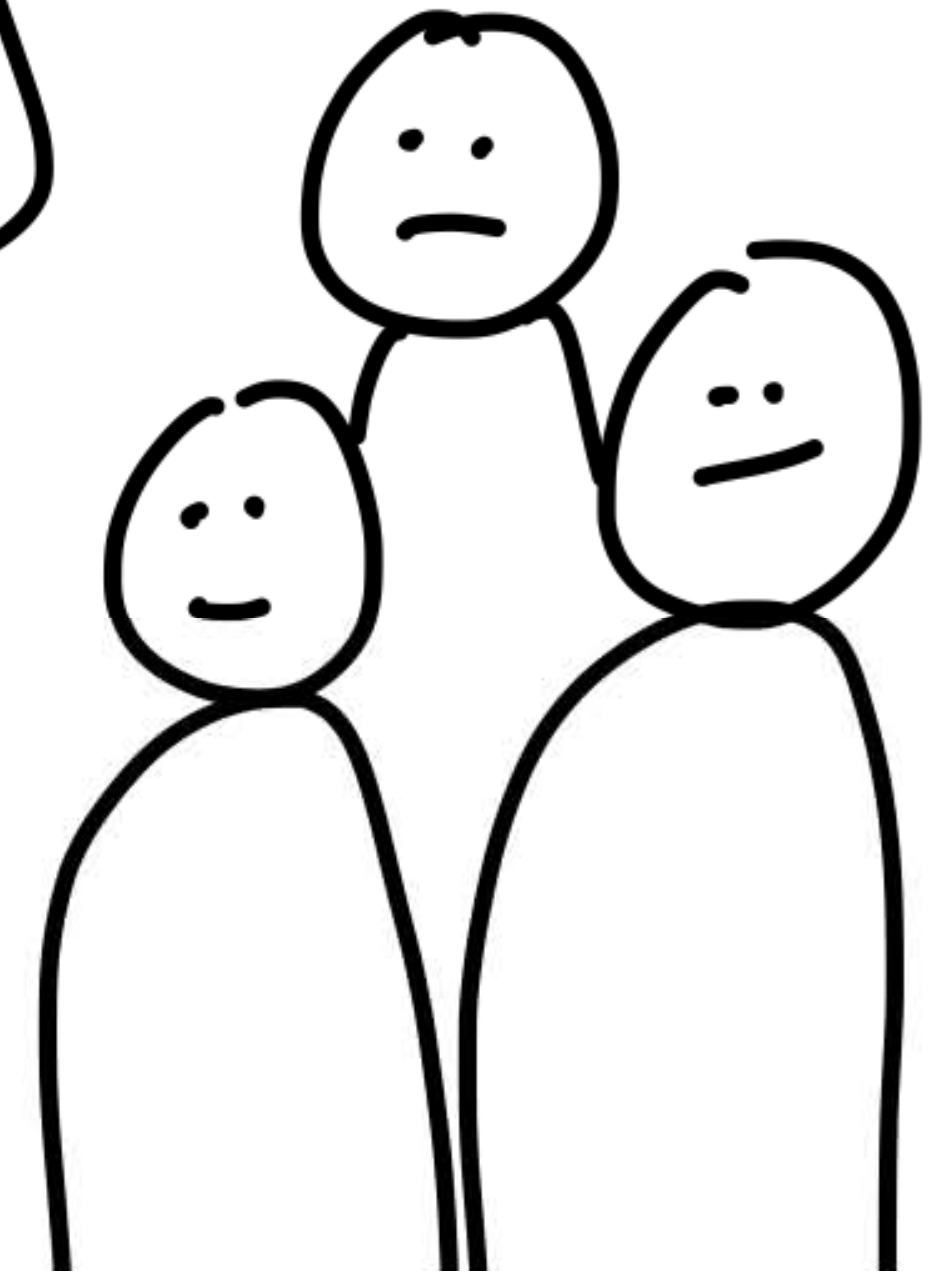


Spreadsheets are code

Not real
programming

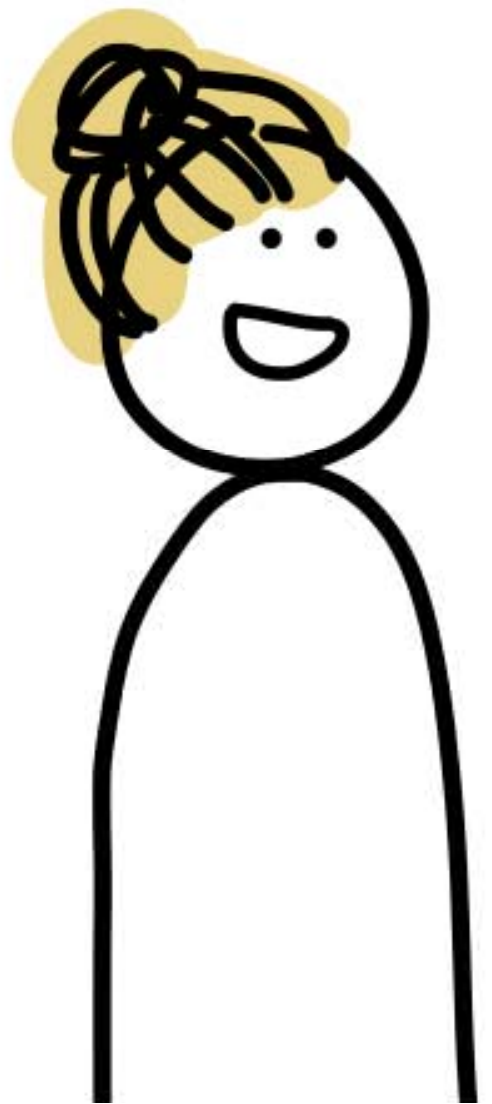


2010

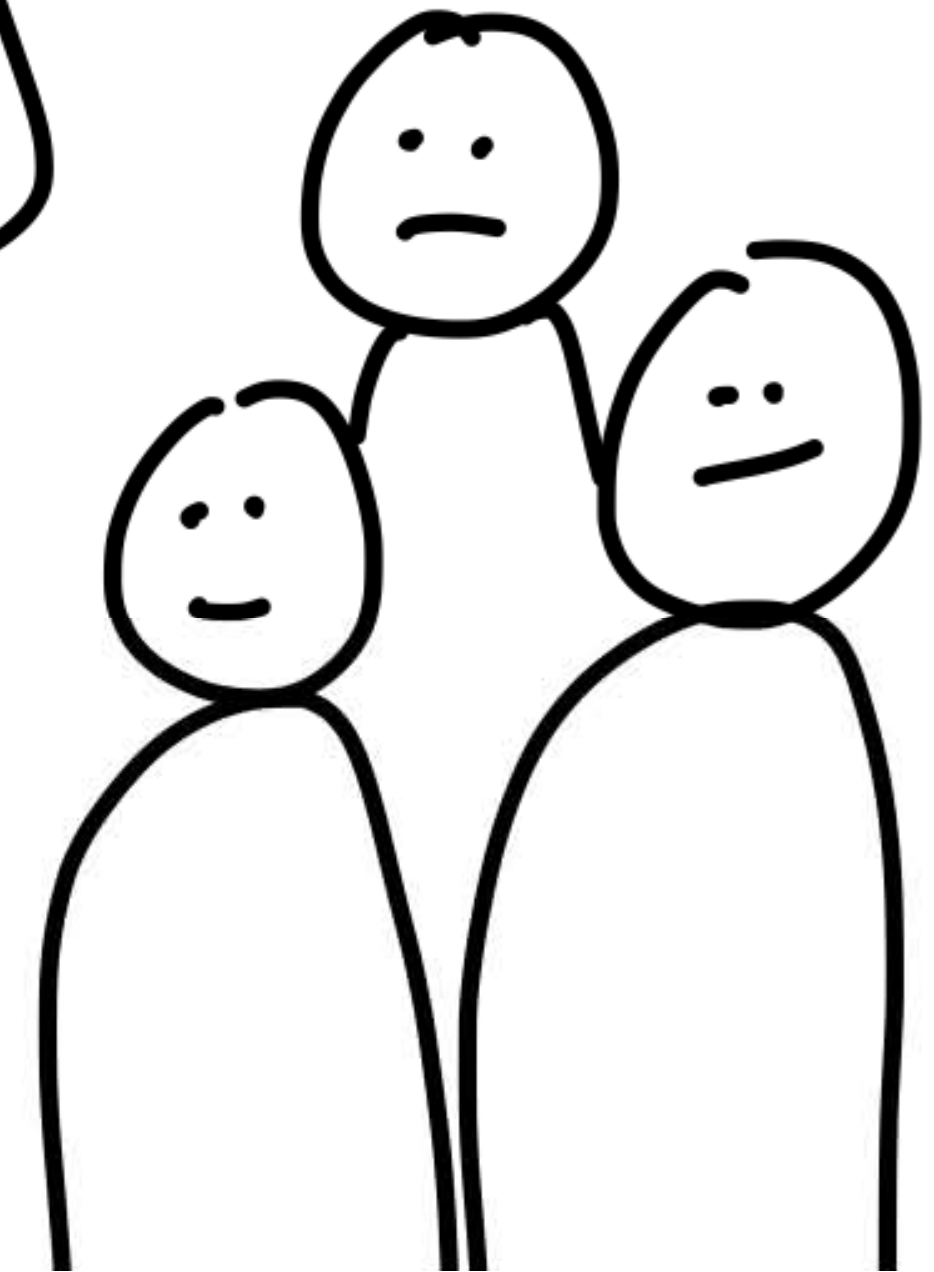


Spreadsheets are code

Not real
programming

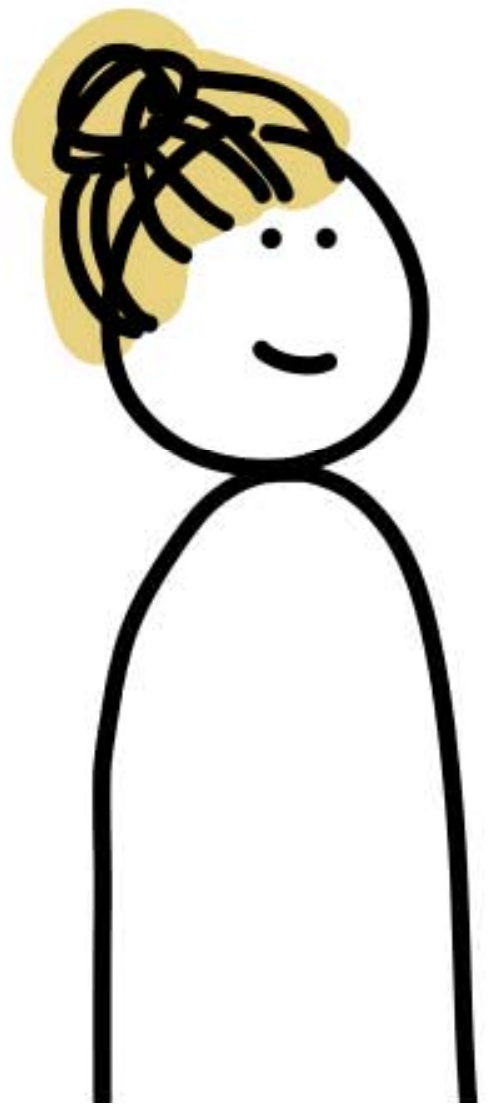


2010

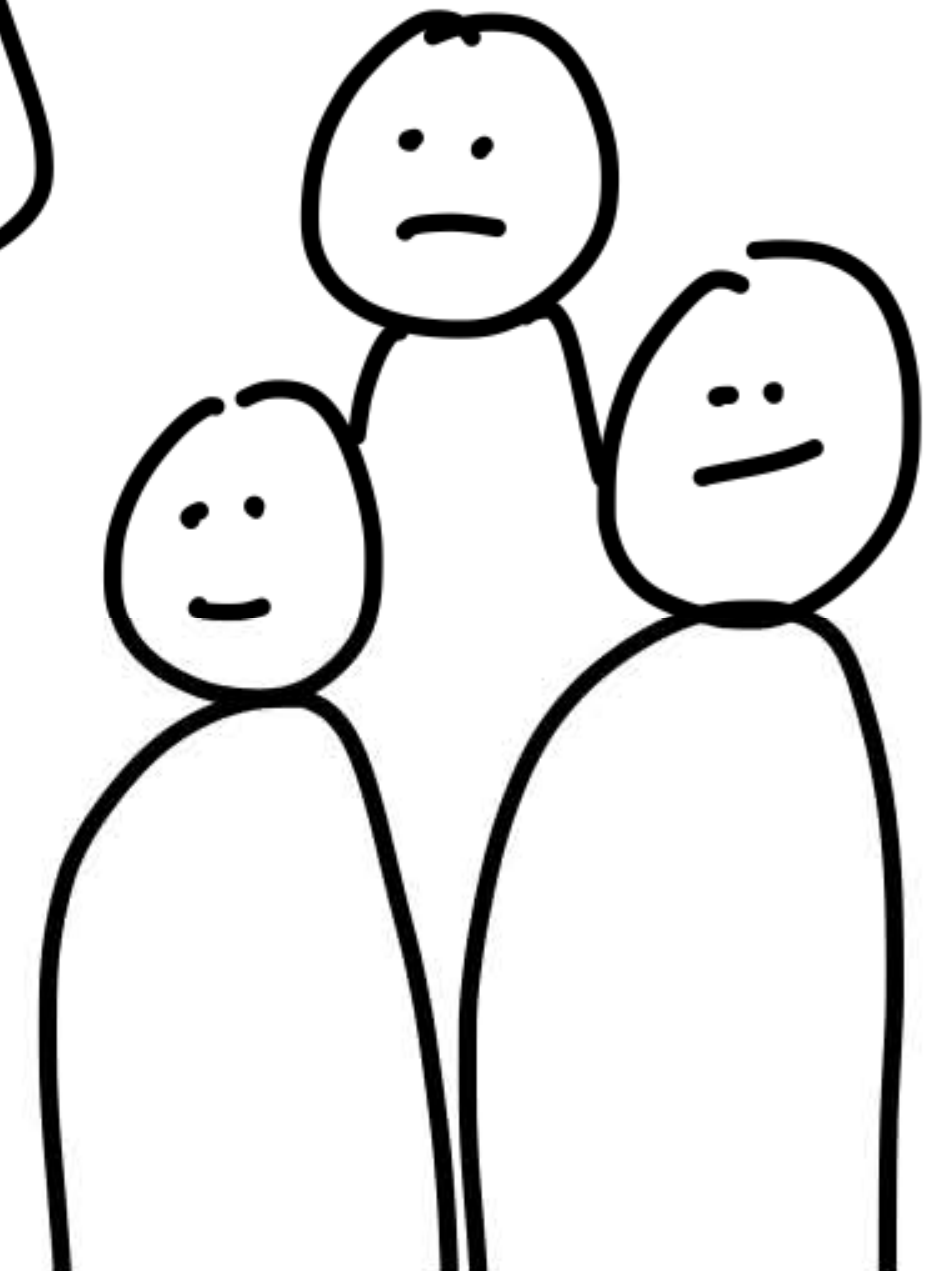


Spreadsheets are code

Not real
programming



2011

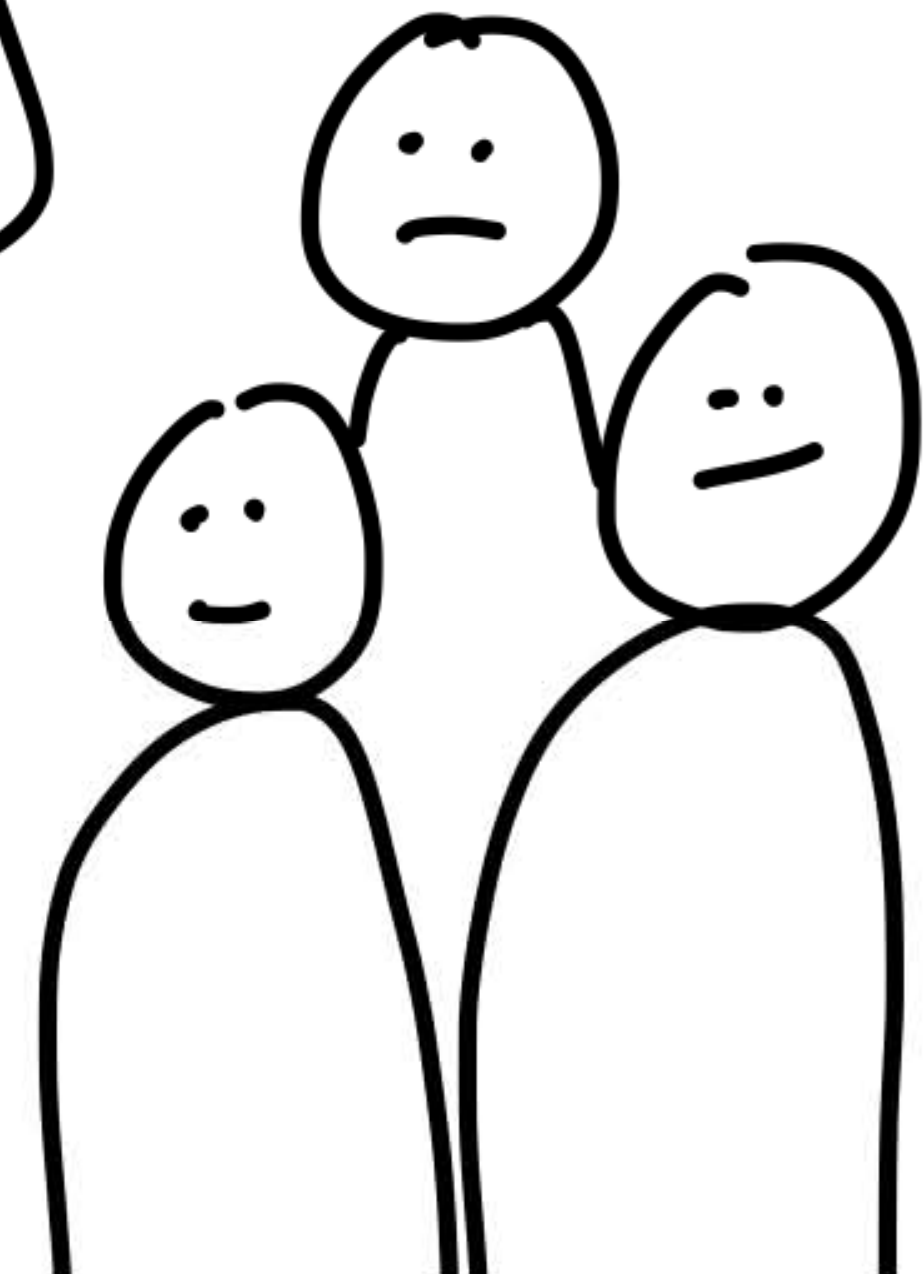


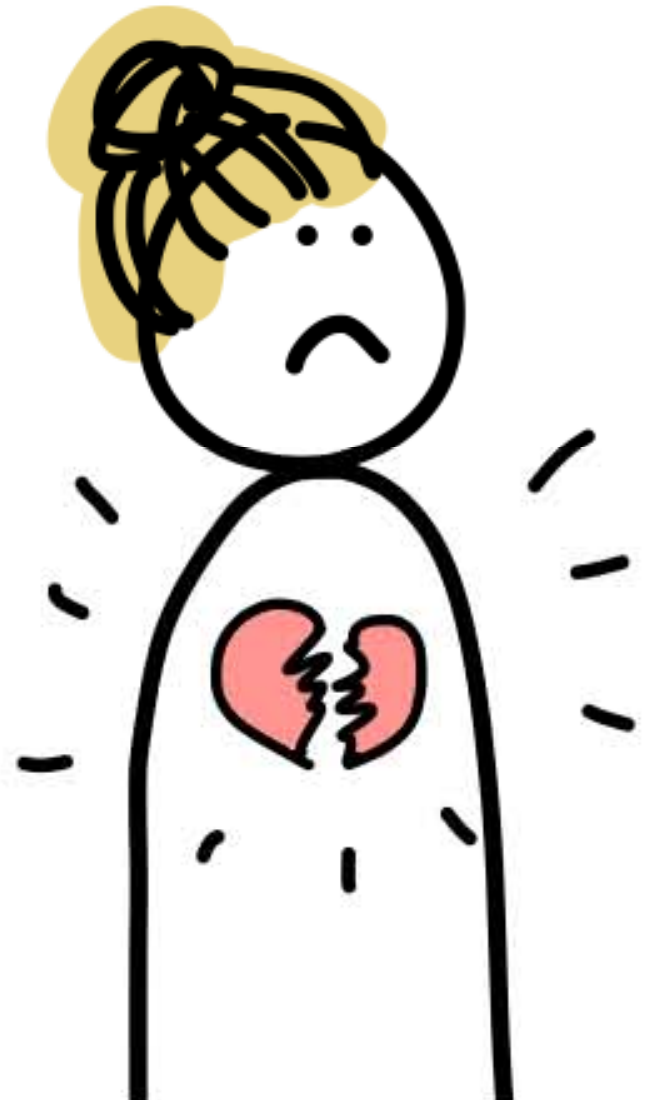
Spreadsheets are code

Not real
programming

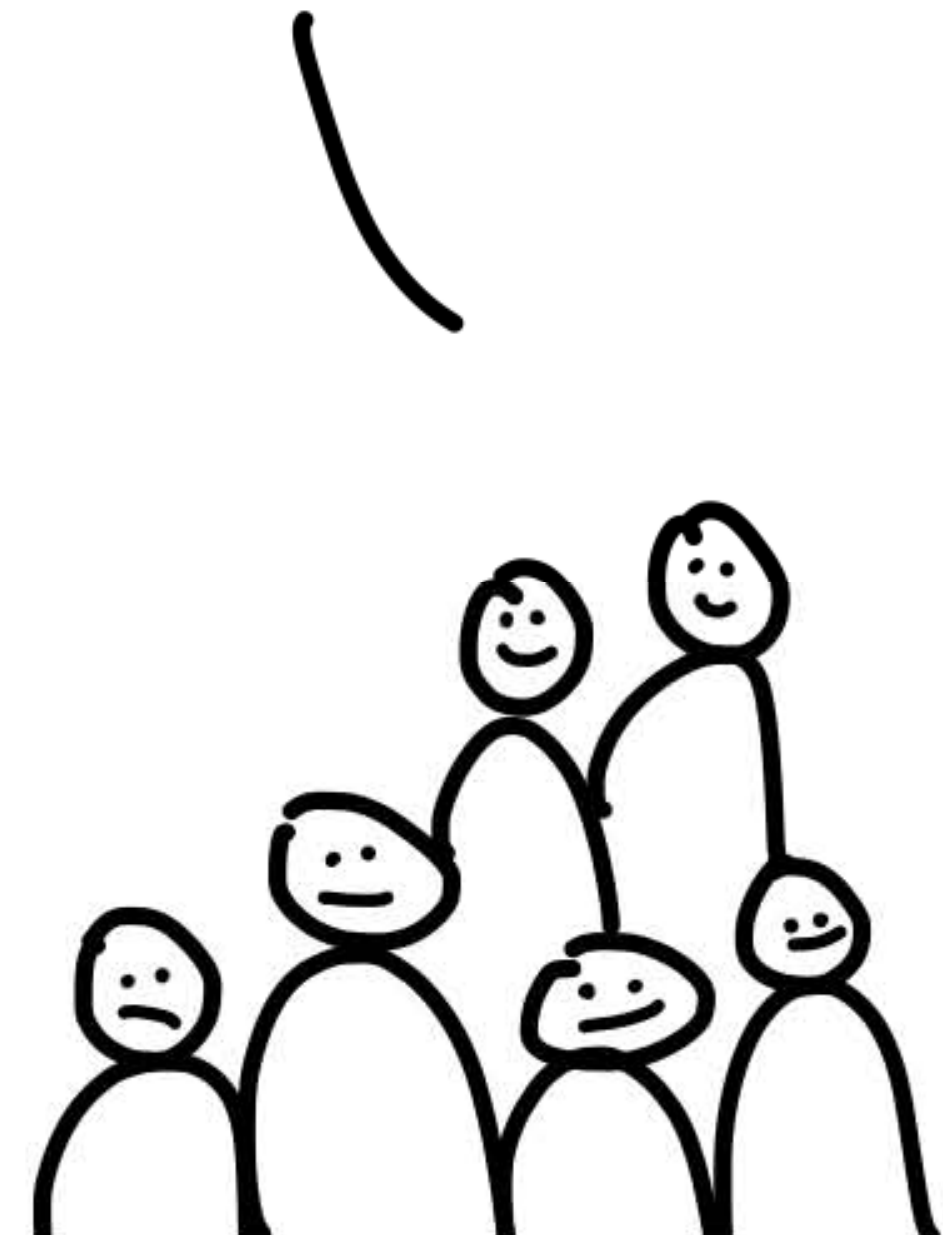
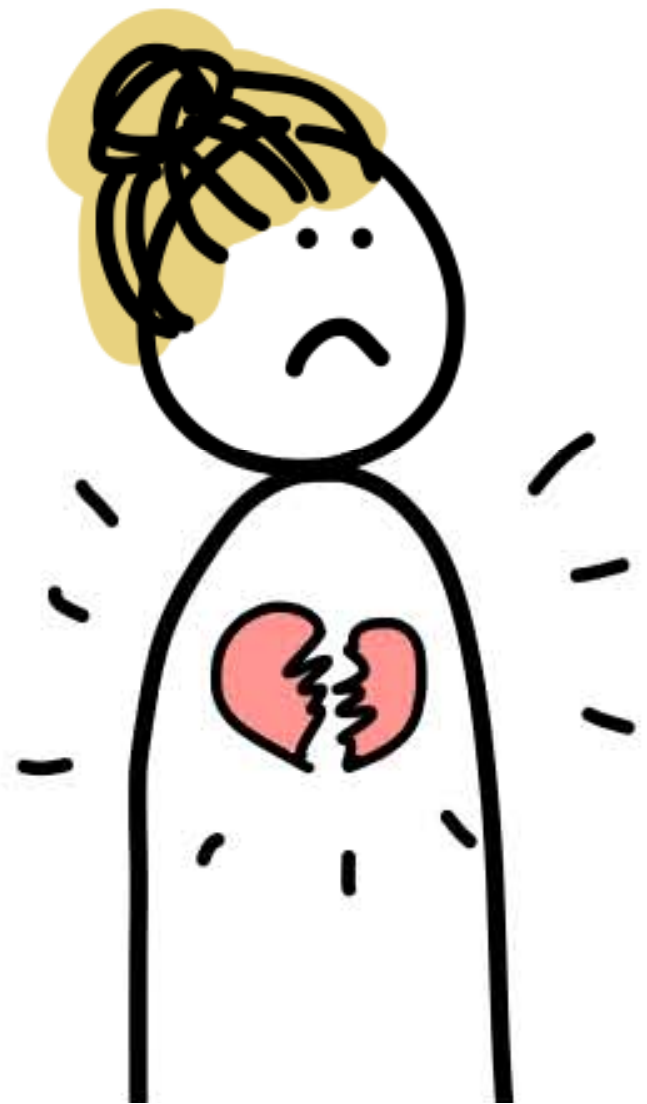


2012

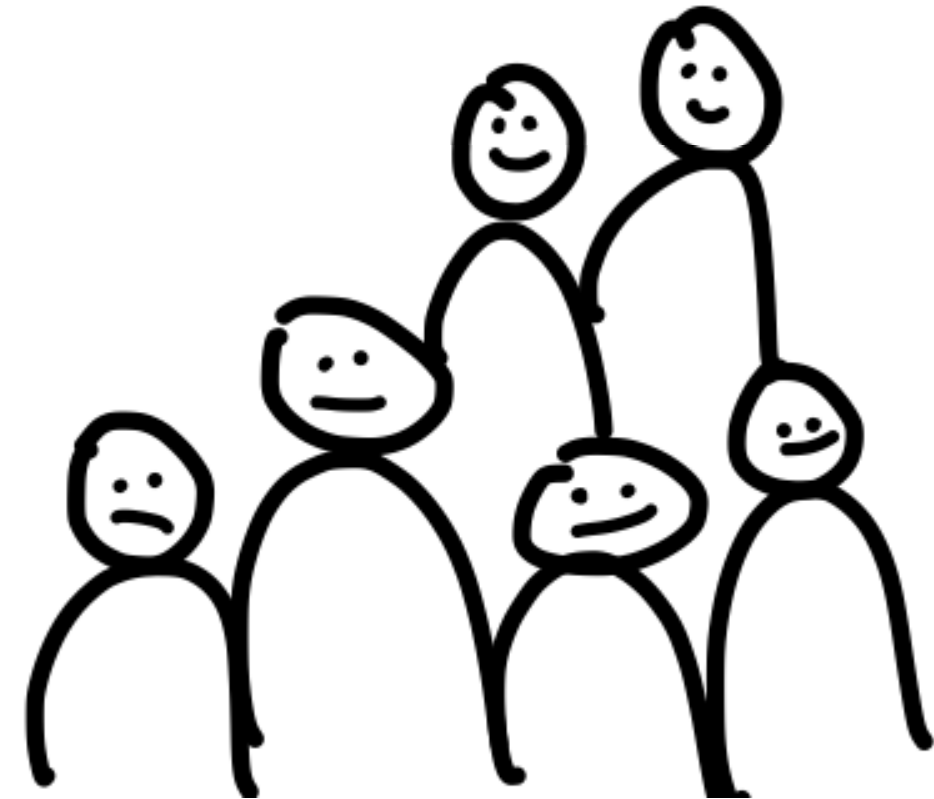
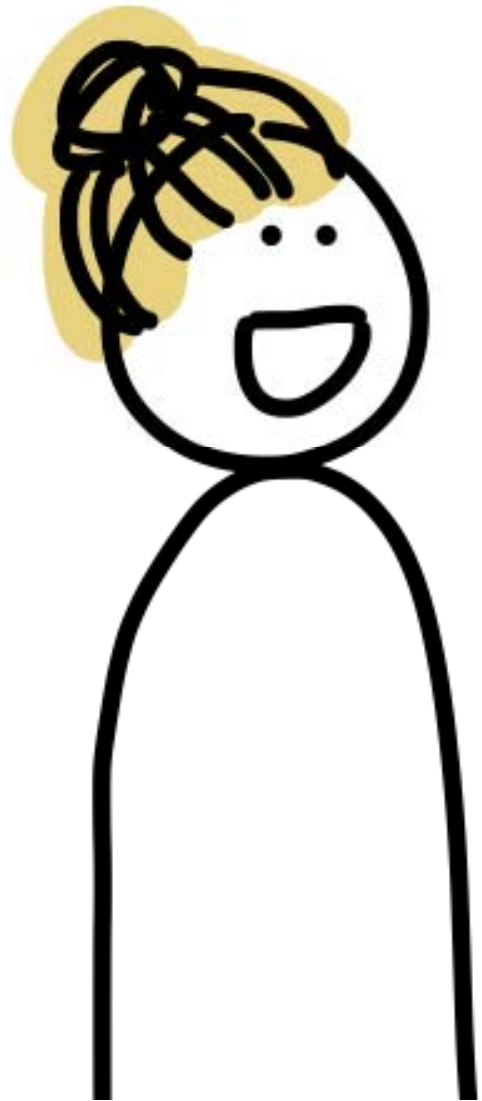




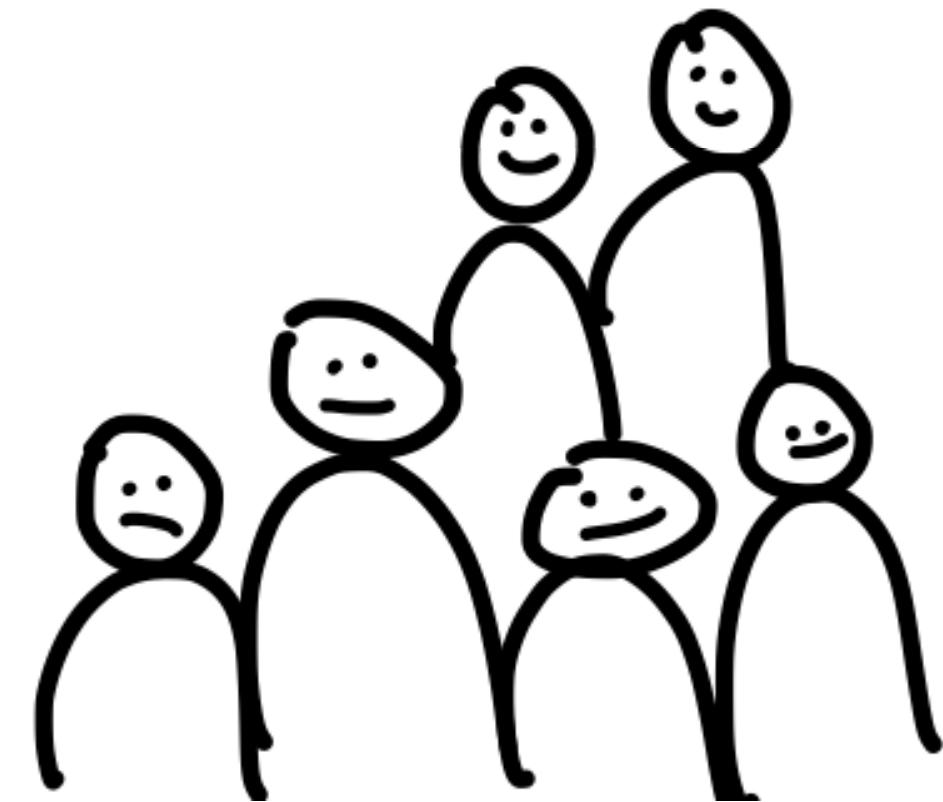
We'd love to
learn programming

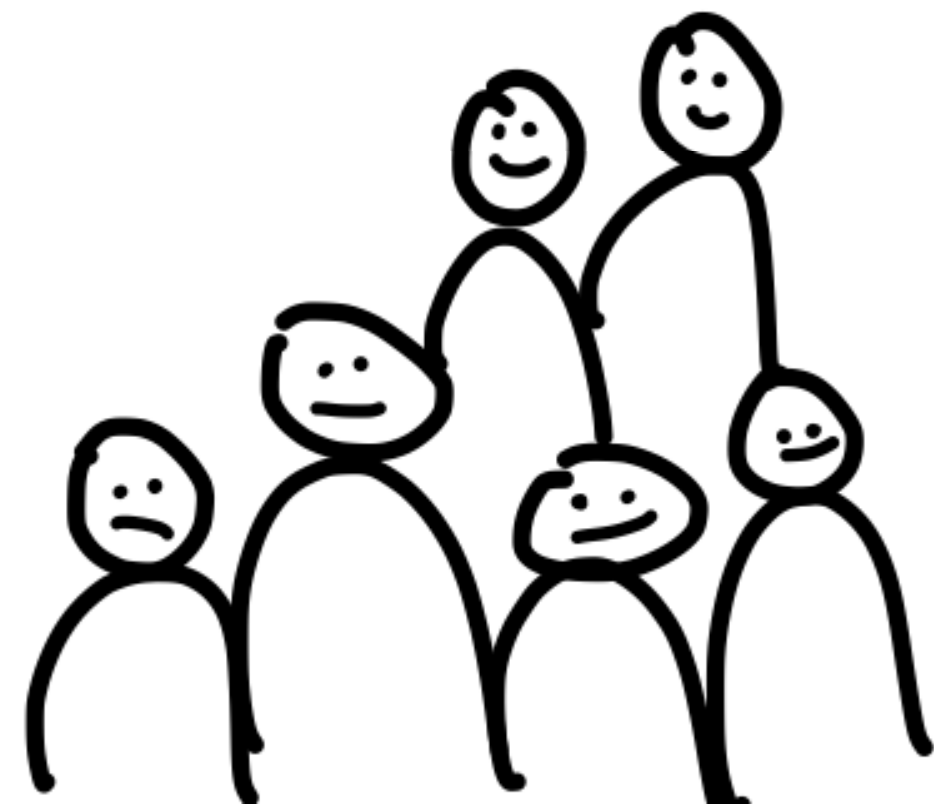
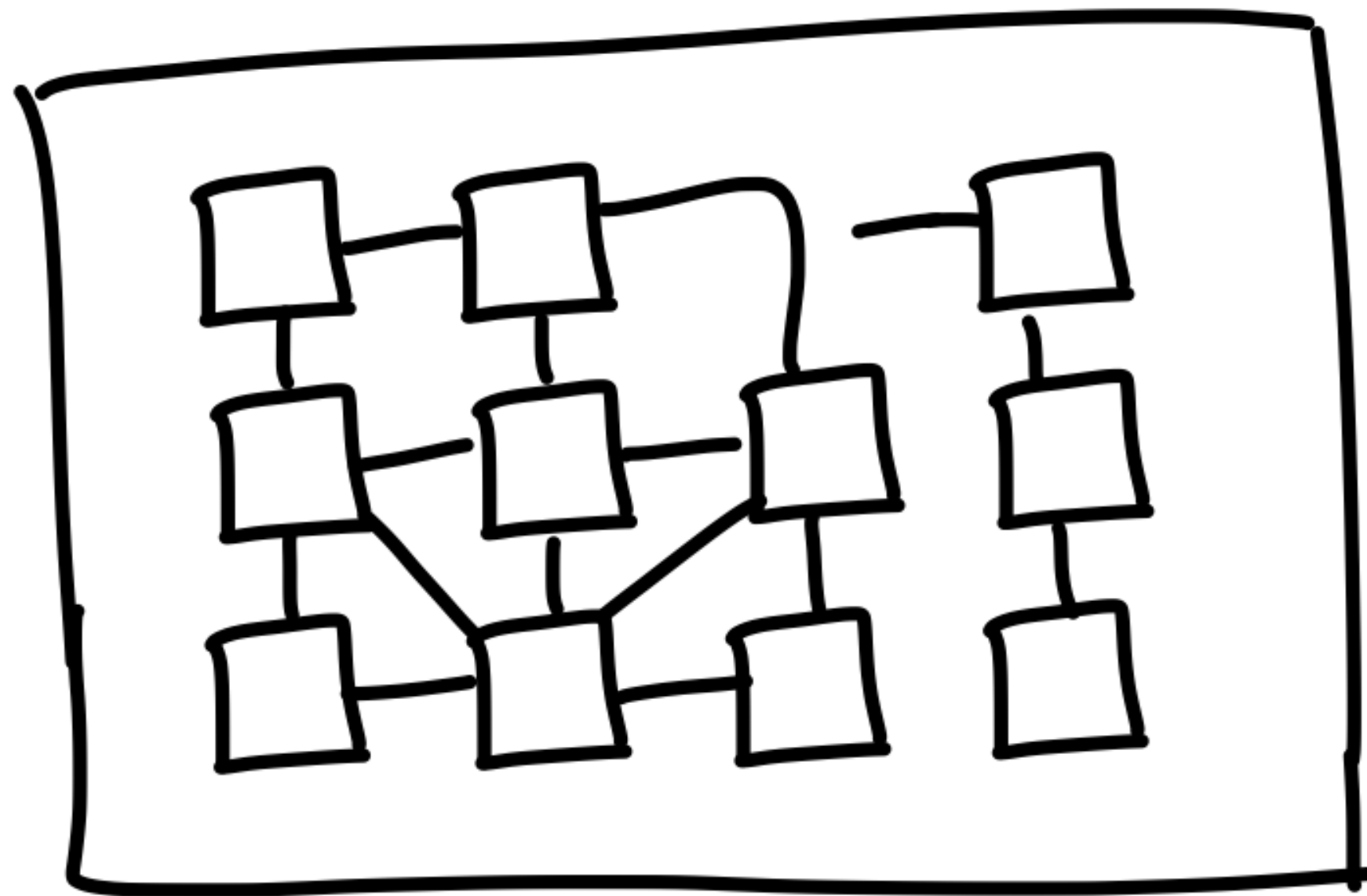
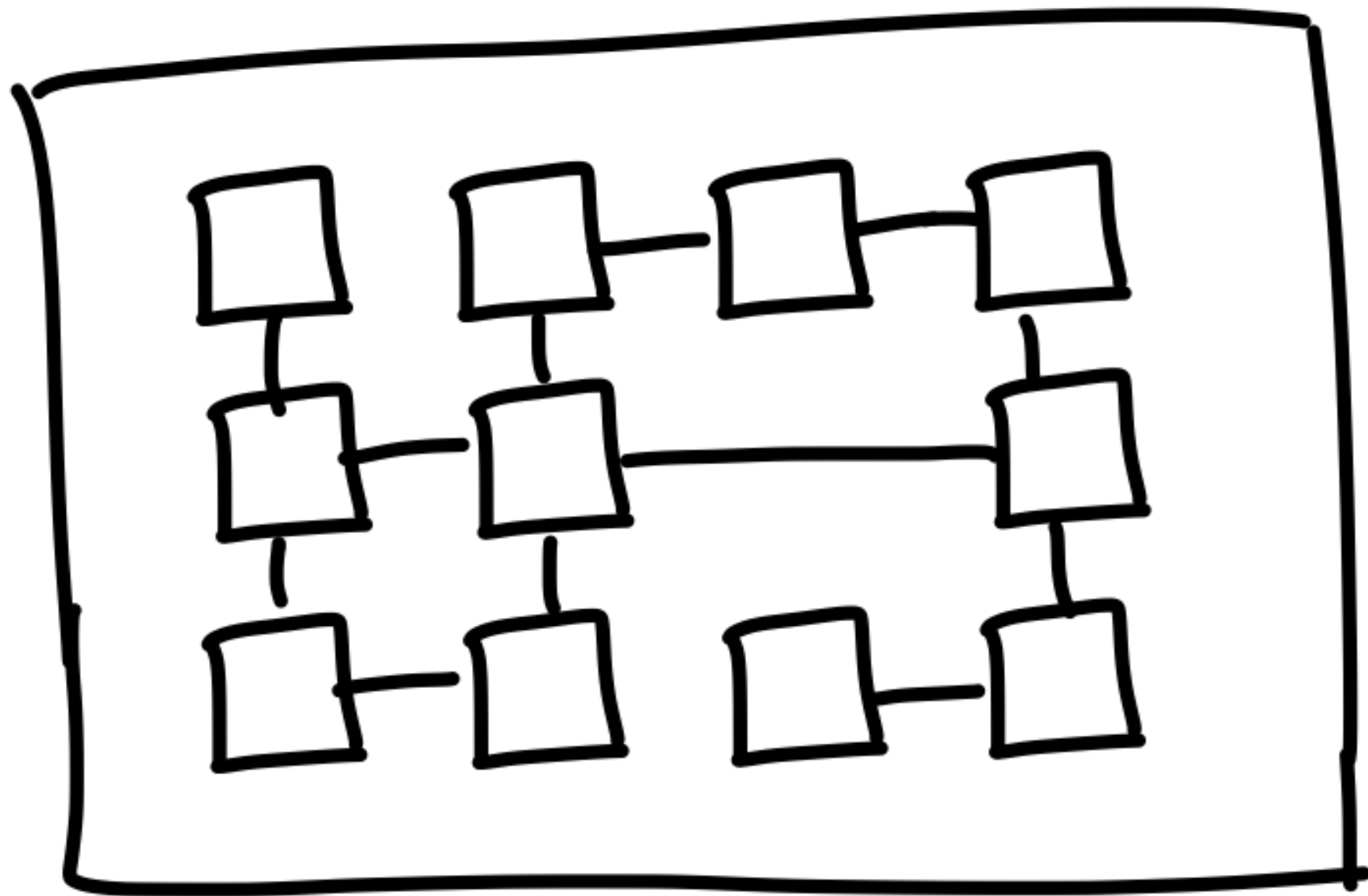


Yeah!



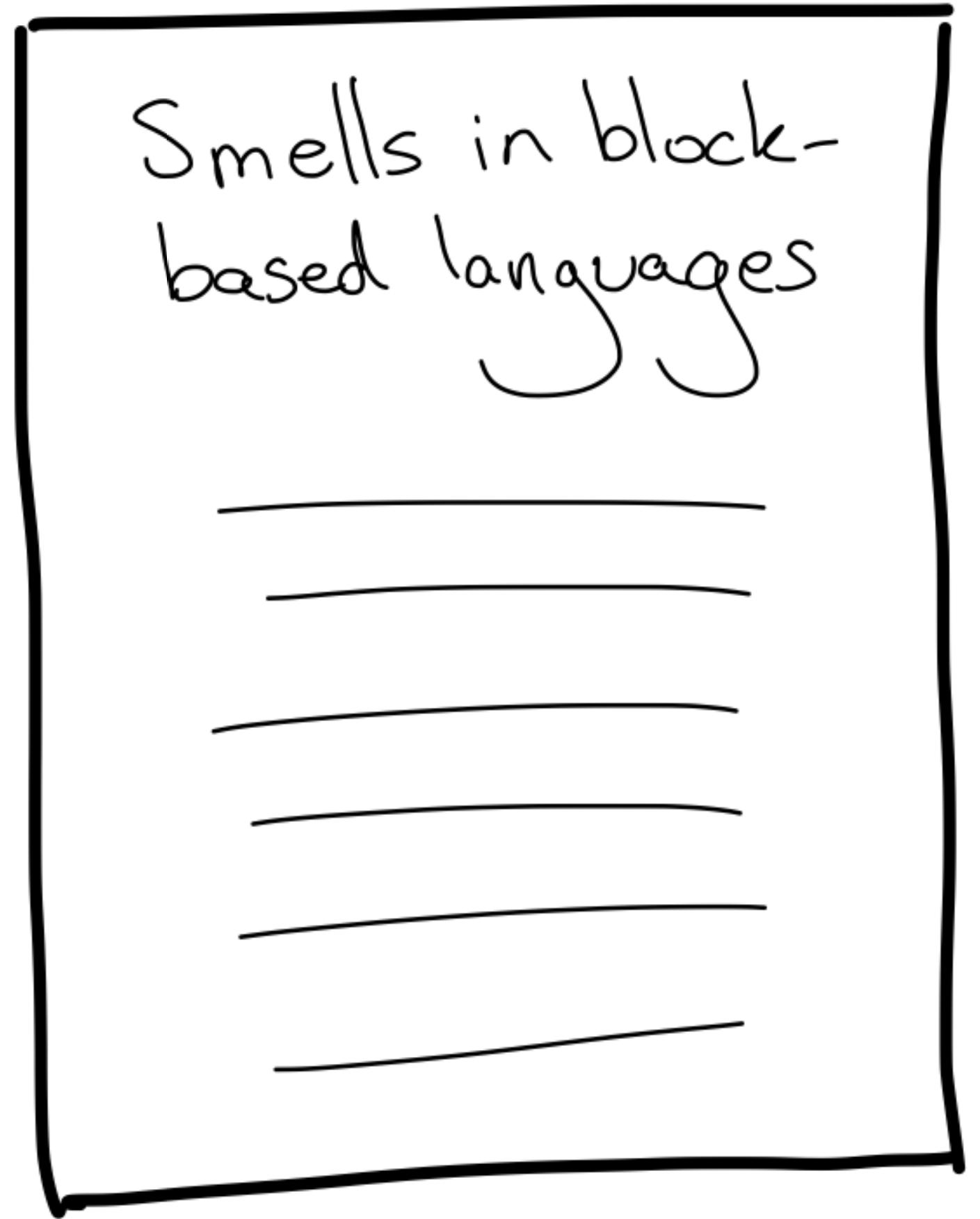
Let's program
a LEGO robot

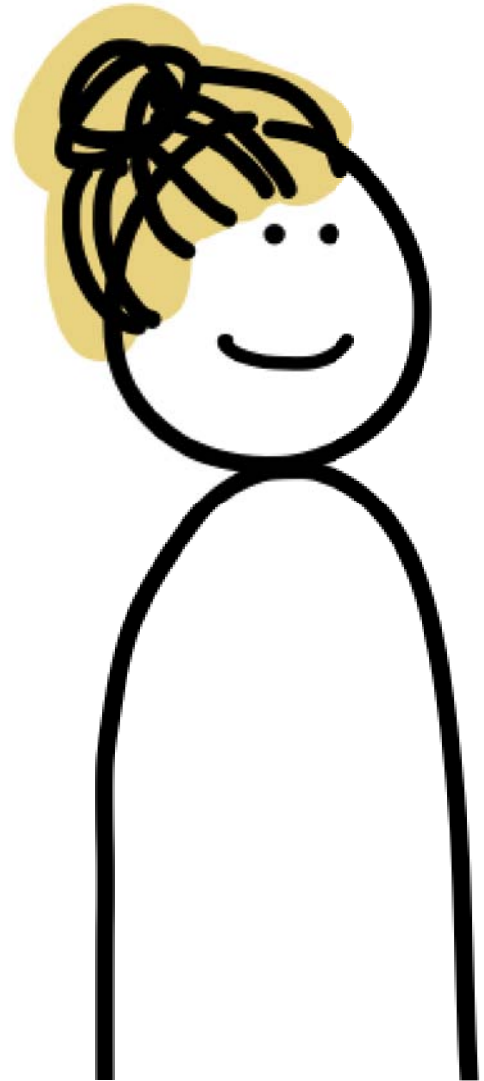






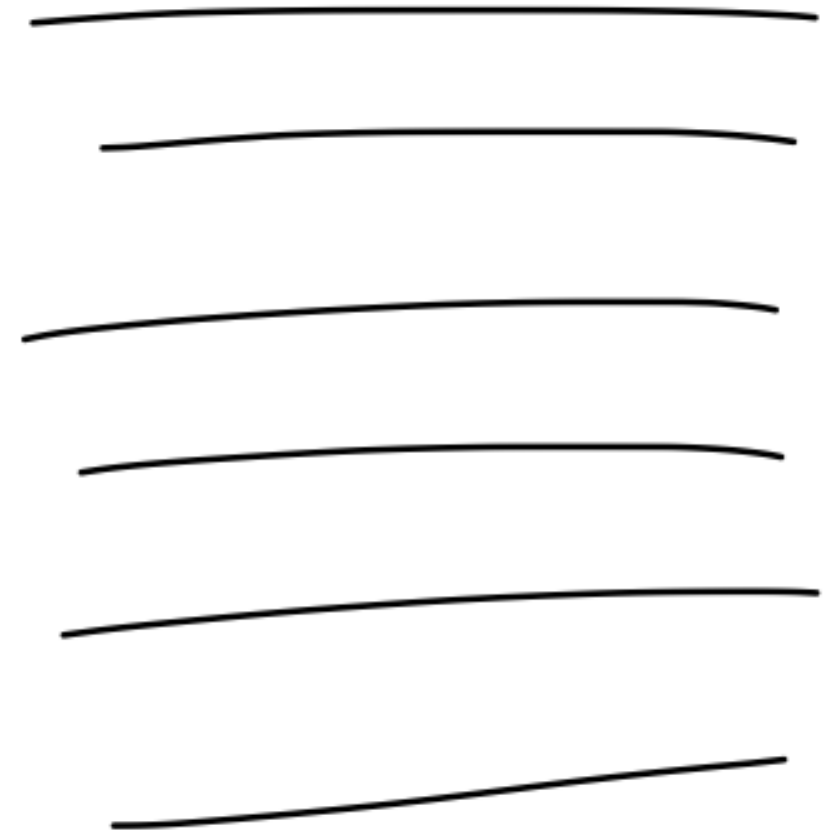
Just one
little paper

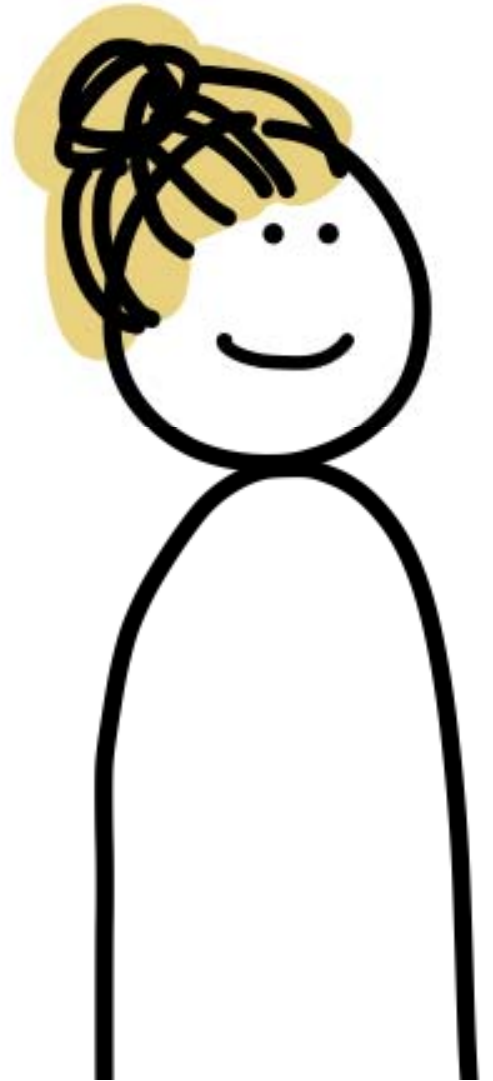




Ok maybe
two papers

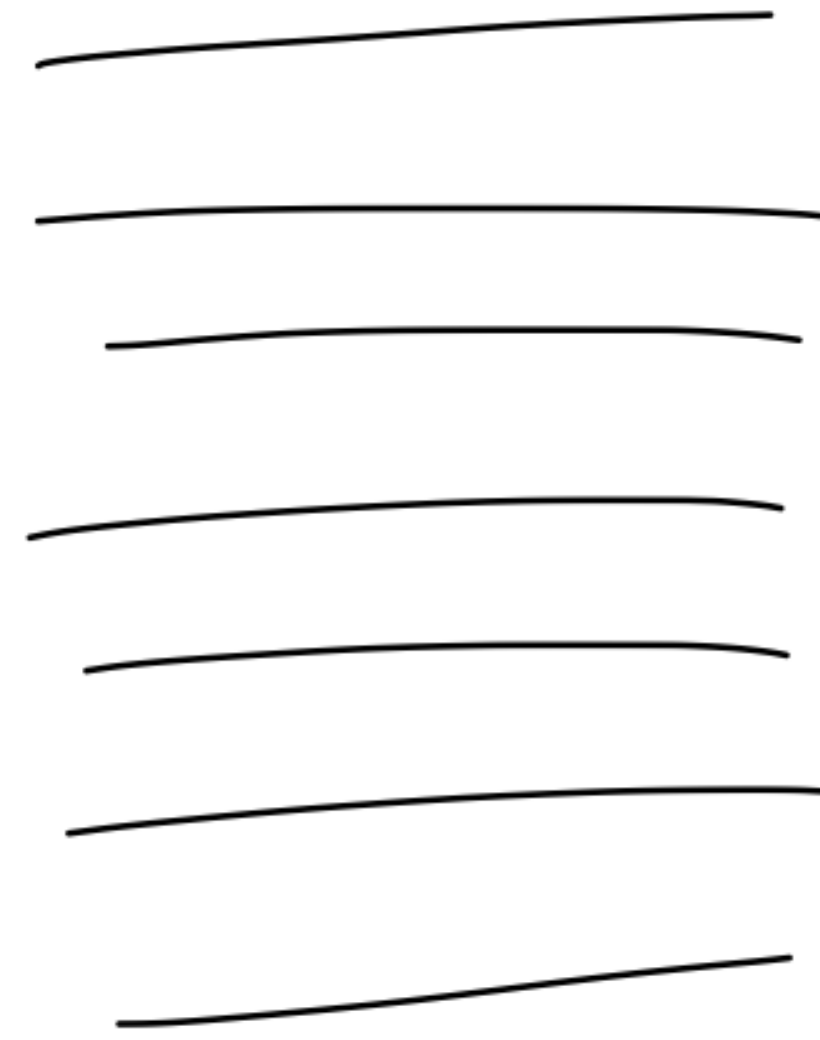
Do code smells hamper
novice programmers?



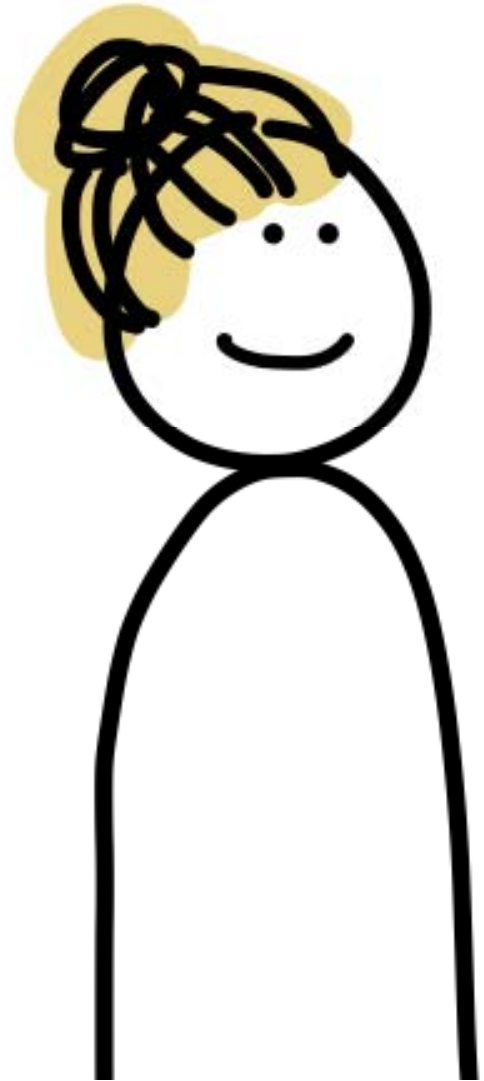


Maybe I am
on to
something...

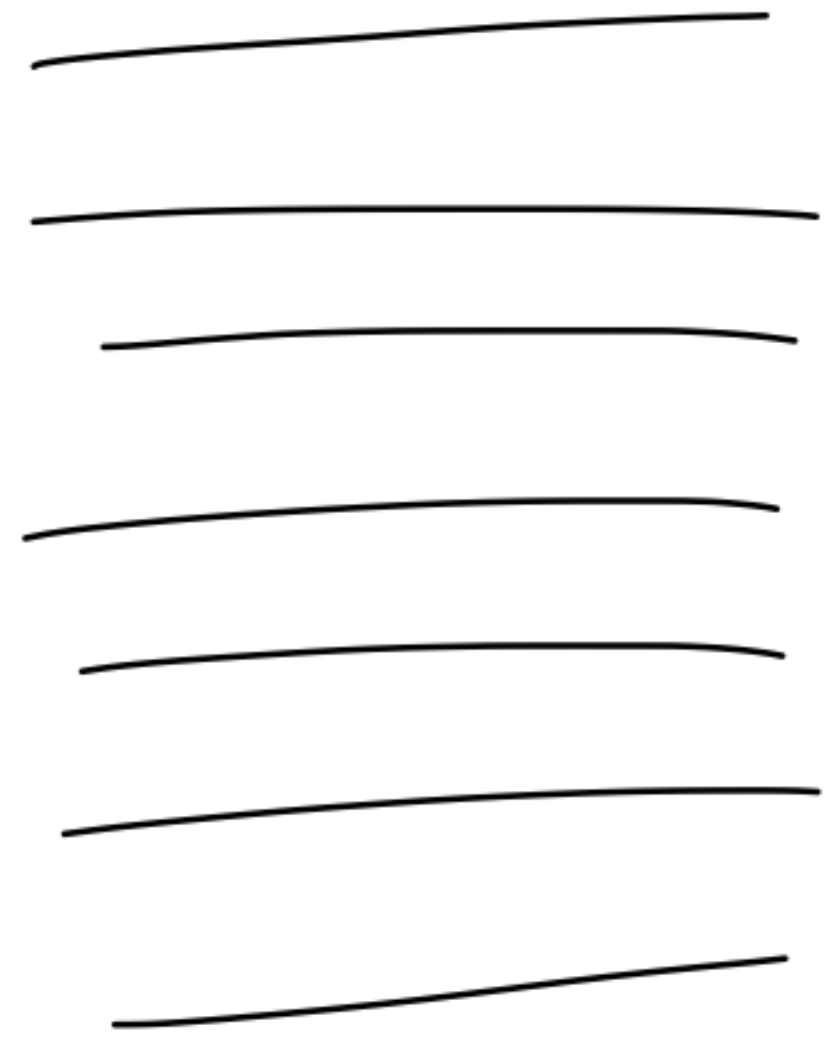
How kids code and
how we know



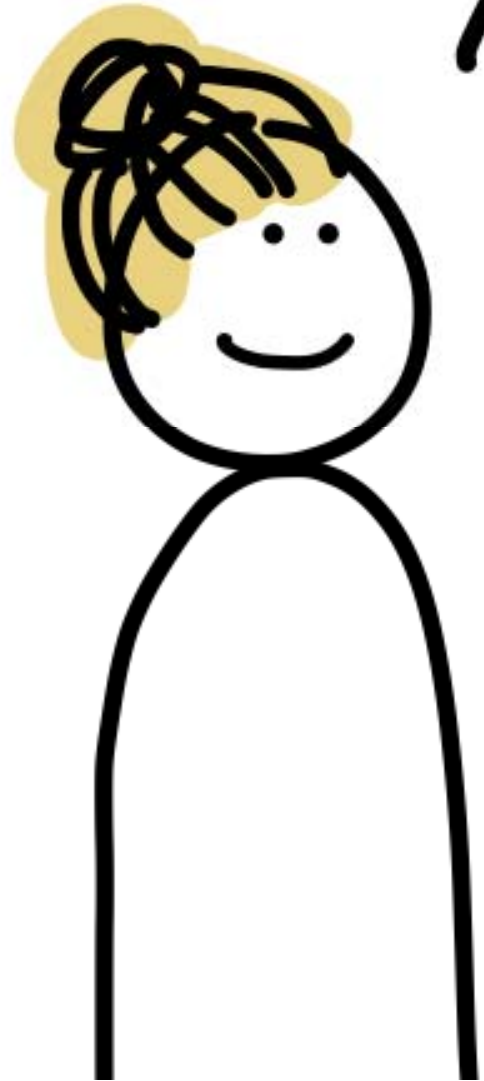
Maybe this is
my new topic?



Teaching SE principles
to K-12 students



Time to look back



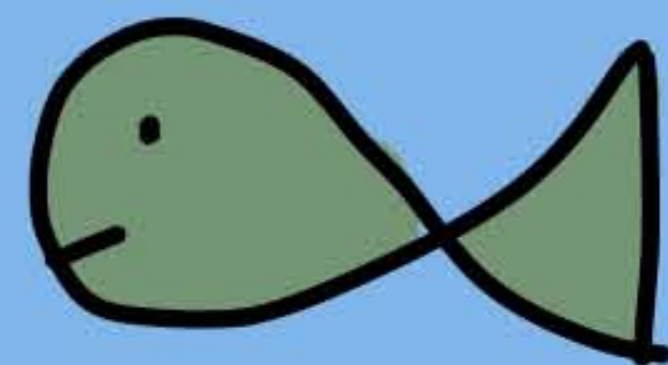
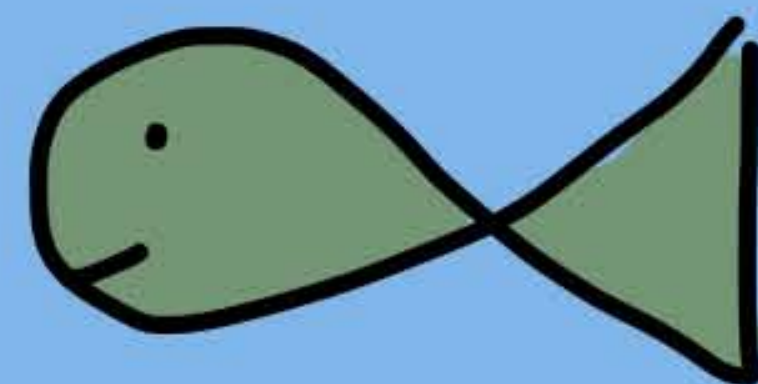
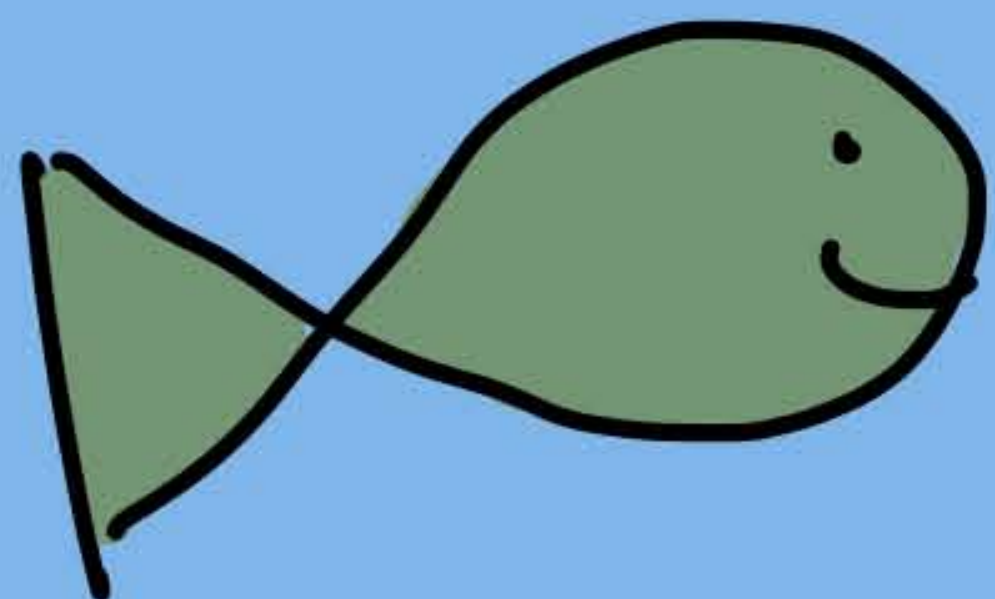
Smells in block-
based languages

Do code smells hamper
novice programmers?

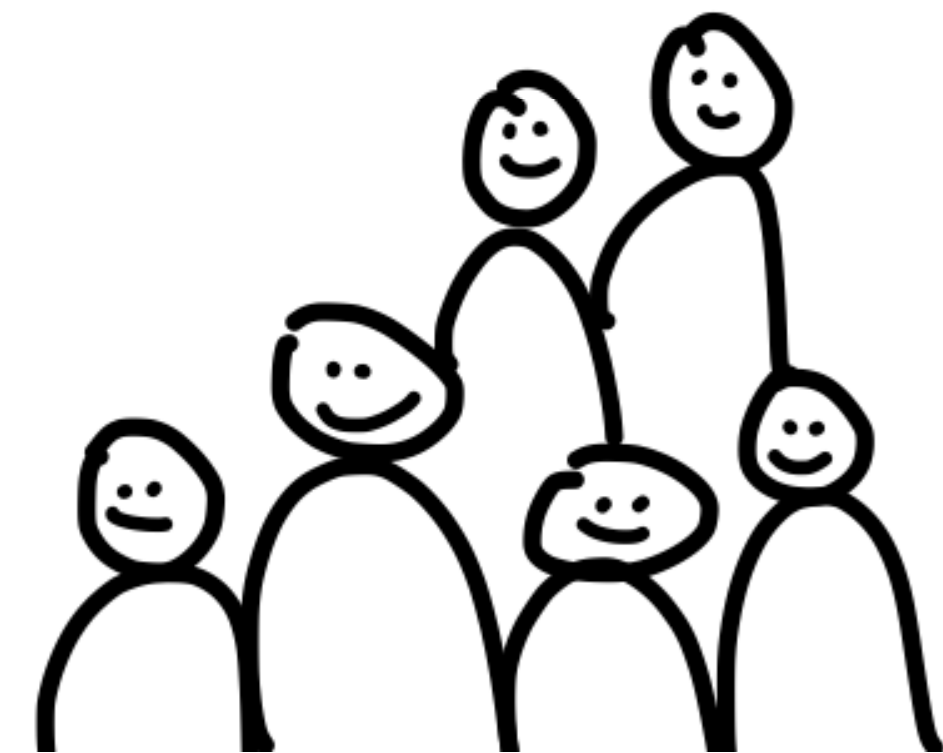
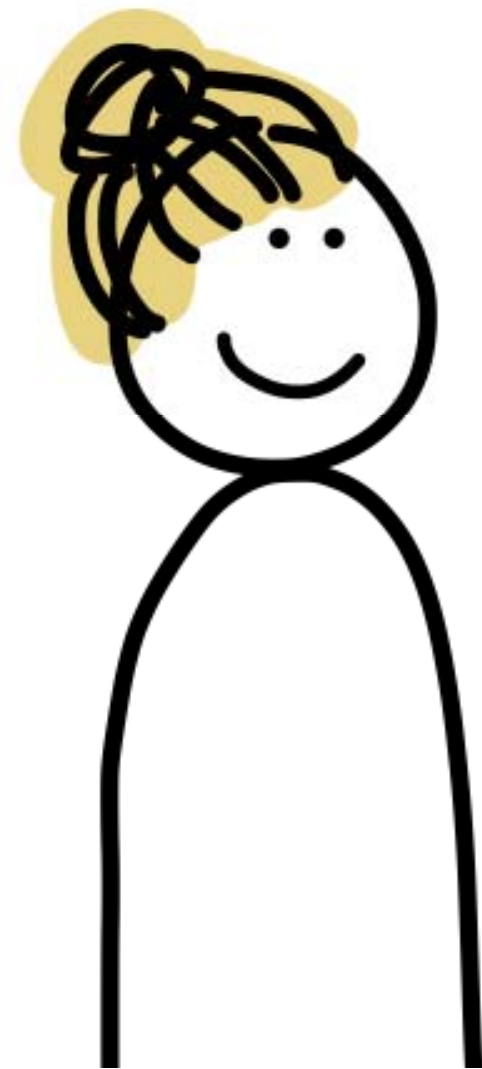
How kids code and
how we know

Teaching SE principles
to K-12 students

The water of programming



What I taught kids

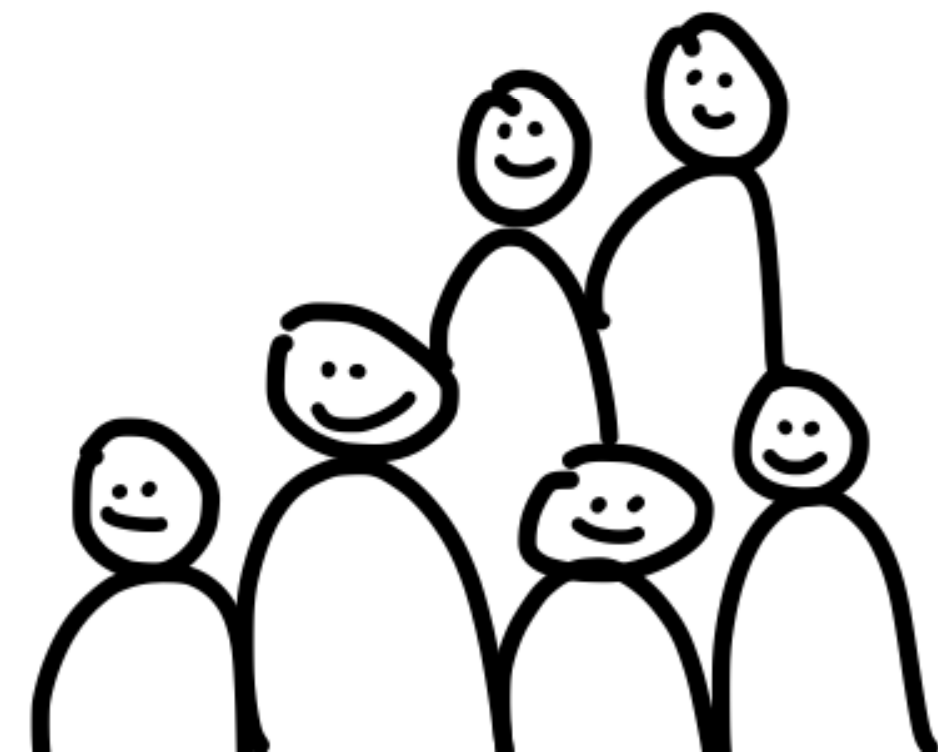
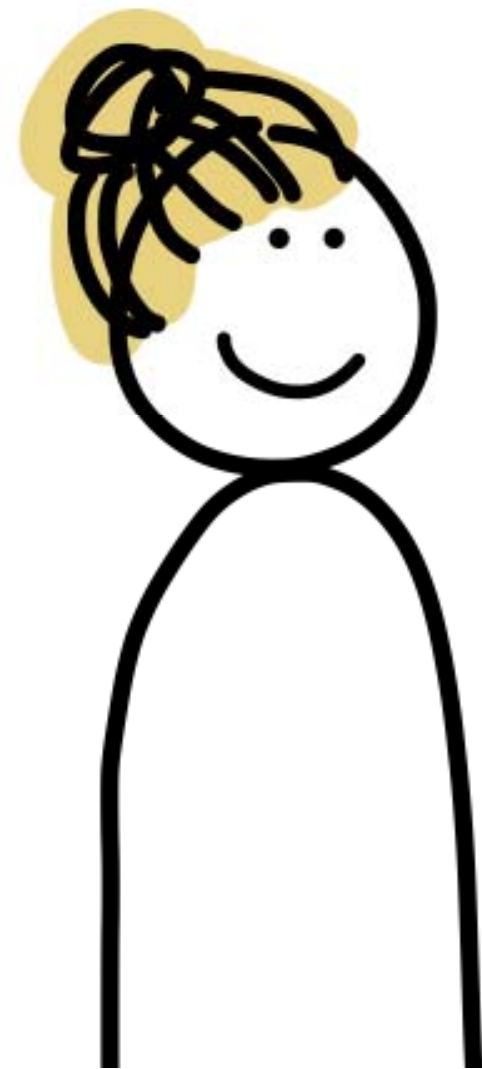


What I taught kids

programming is...

technology

games

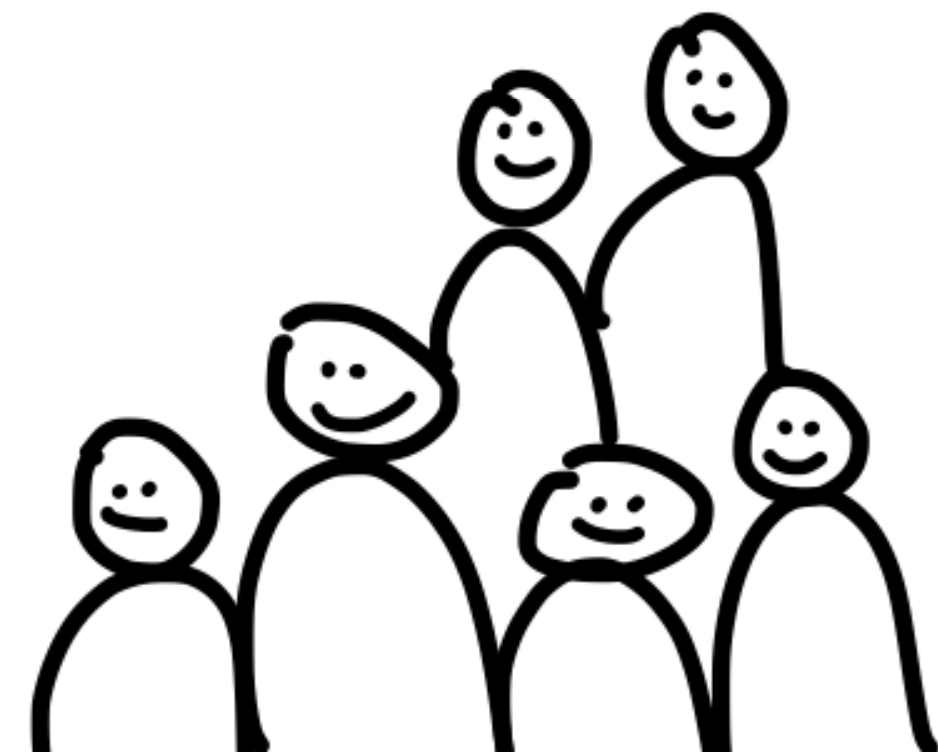
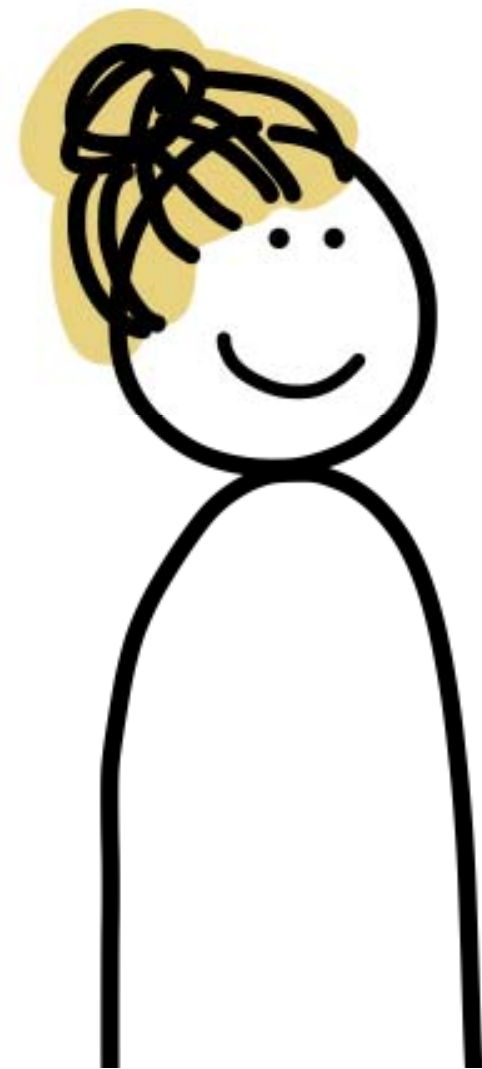


What I taught kids

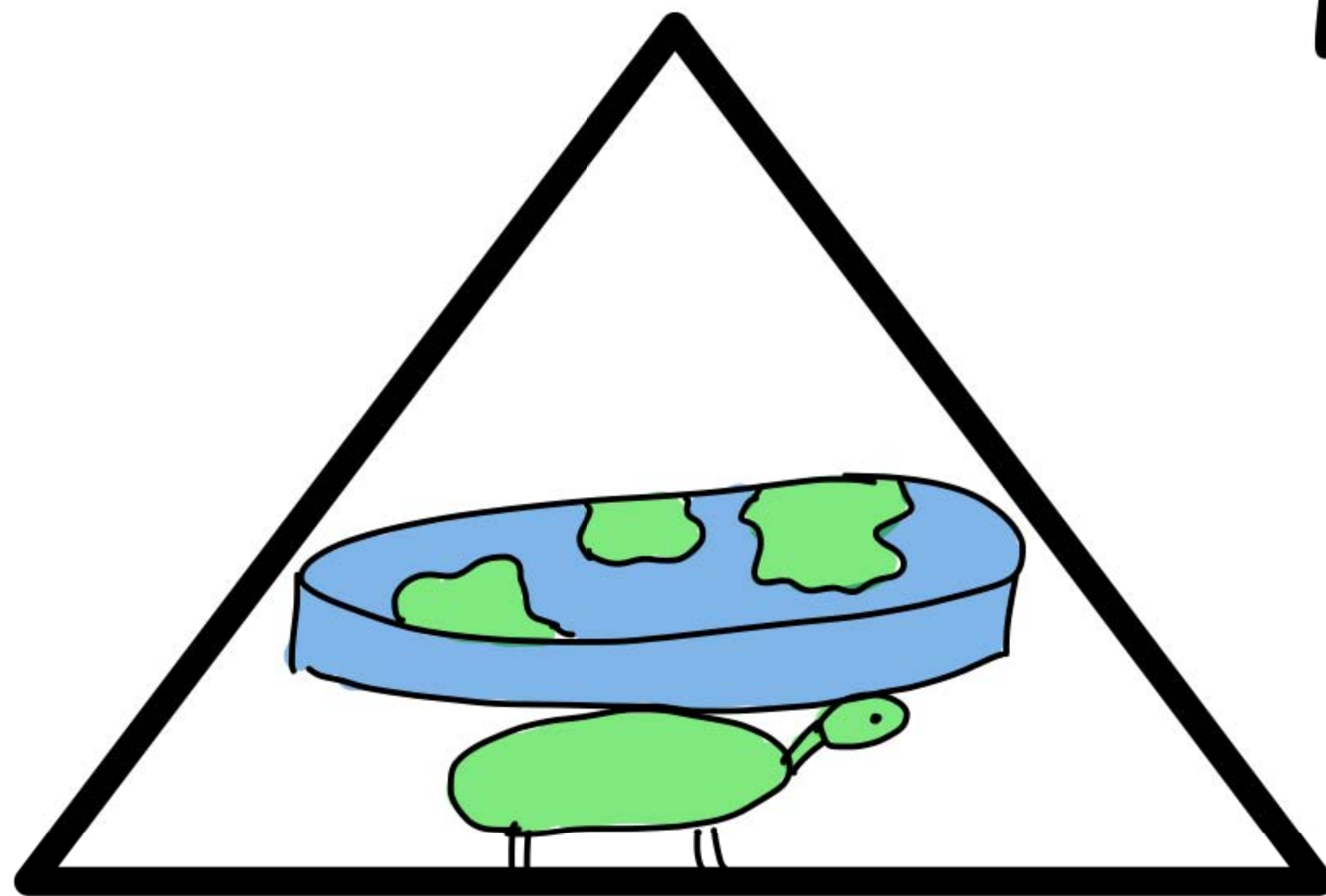
programming is not...

art

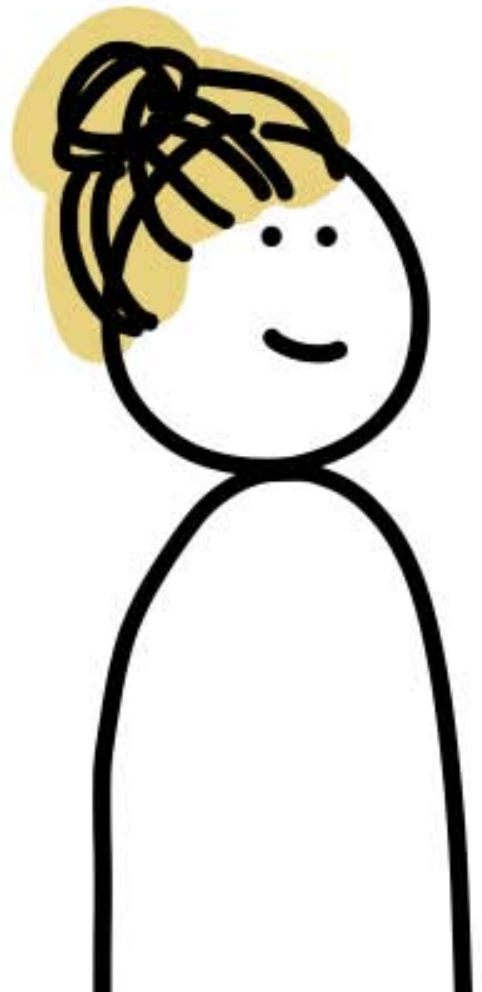
— stories



Beware Controversy ahead



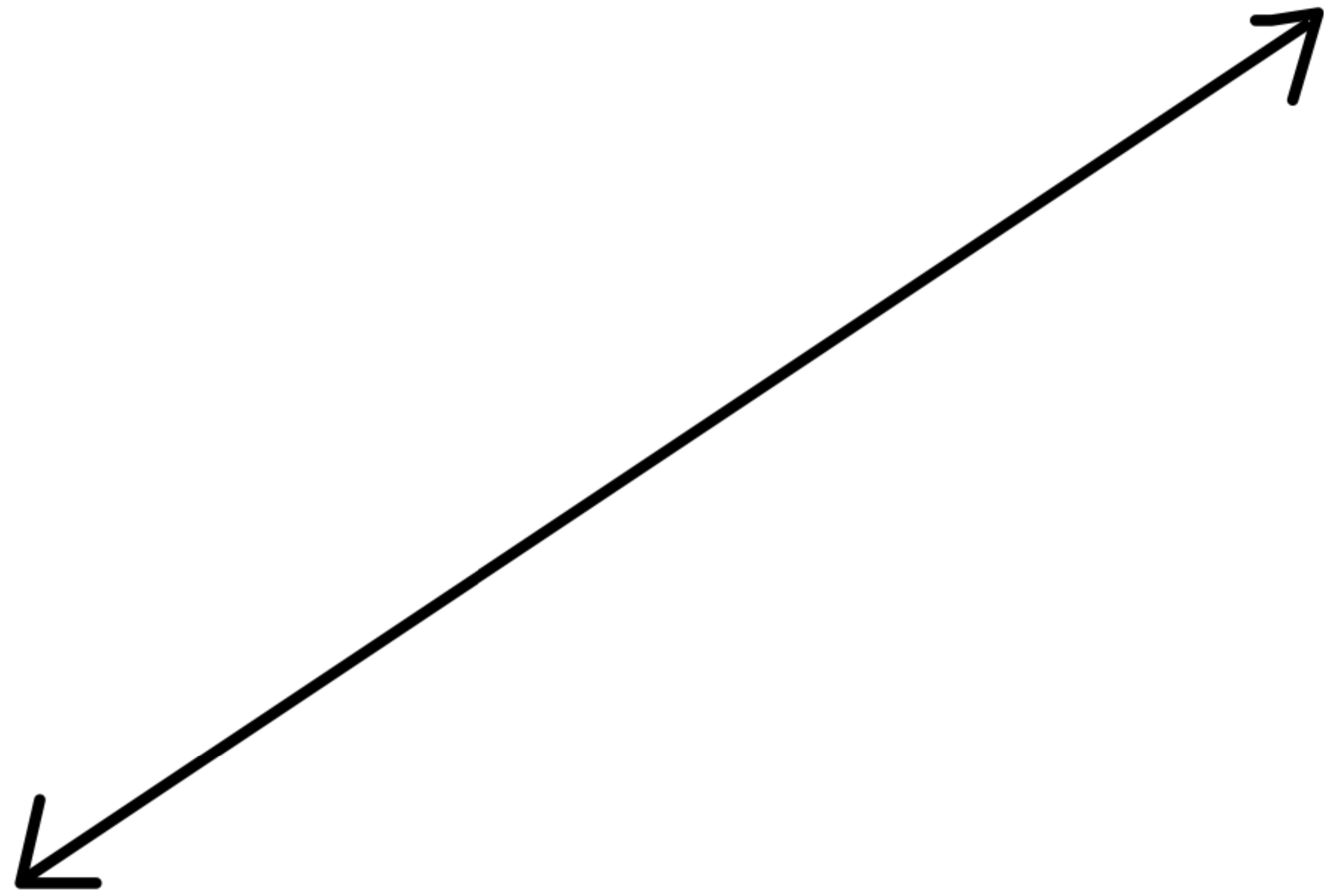
What is programming?



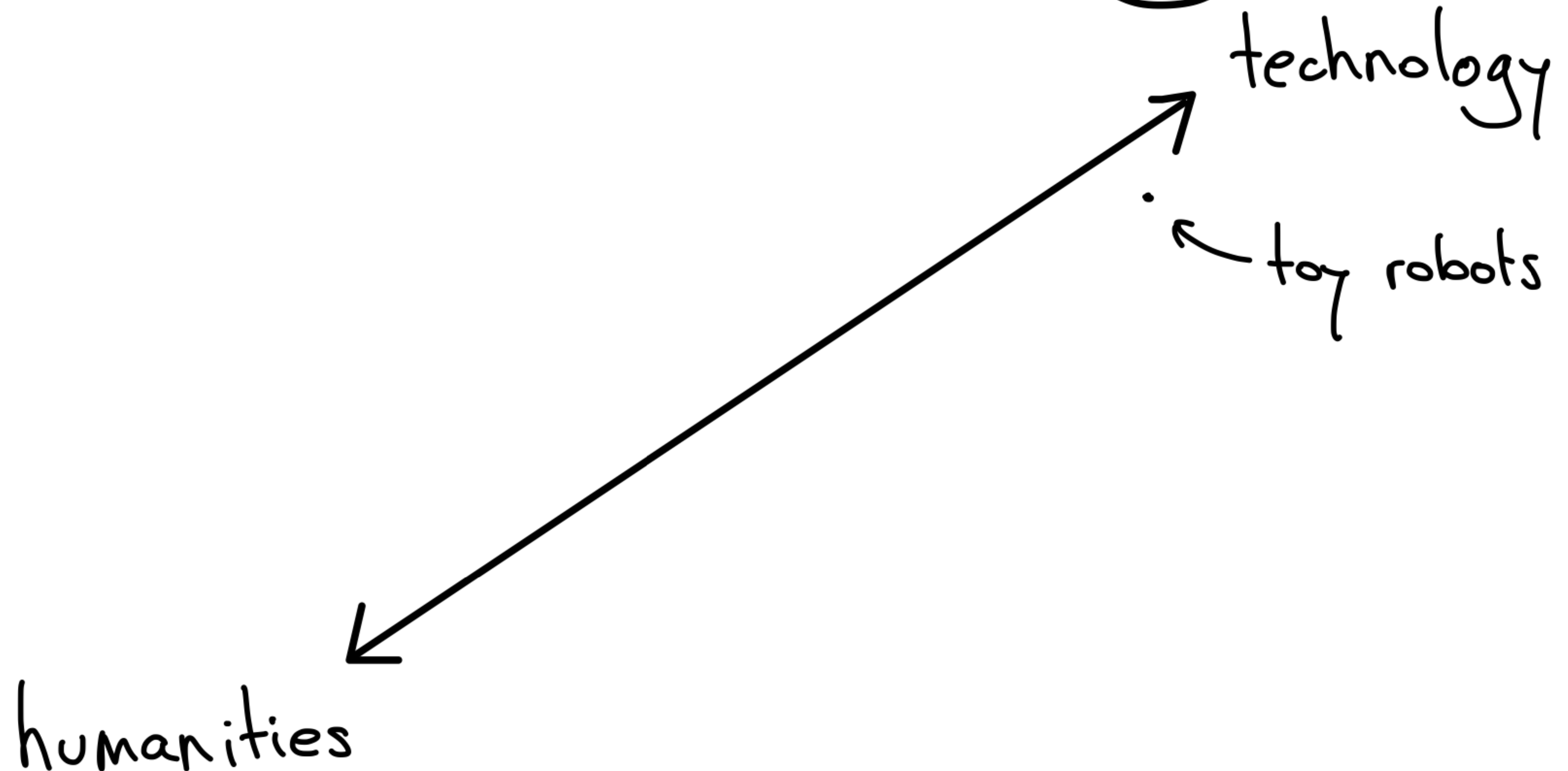
What is programming about?

technology

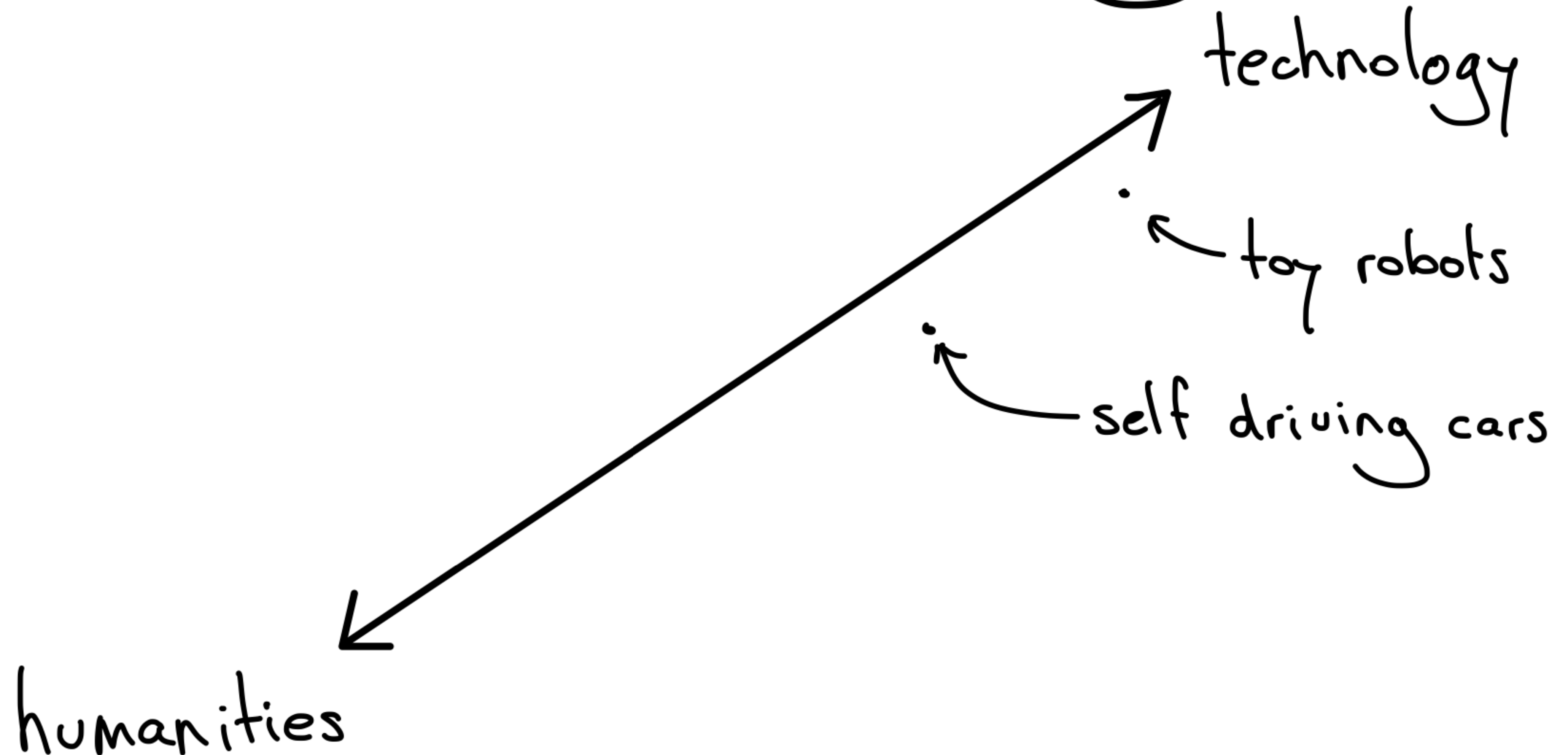
humanities



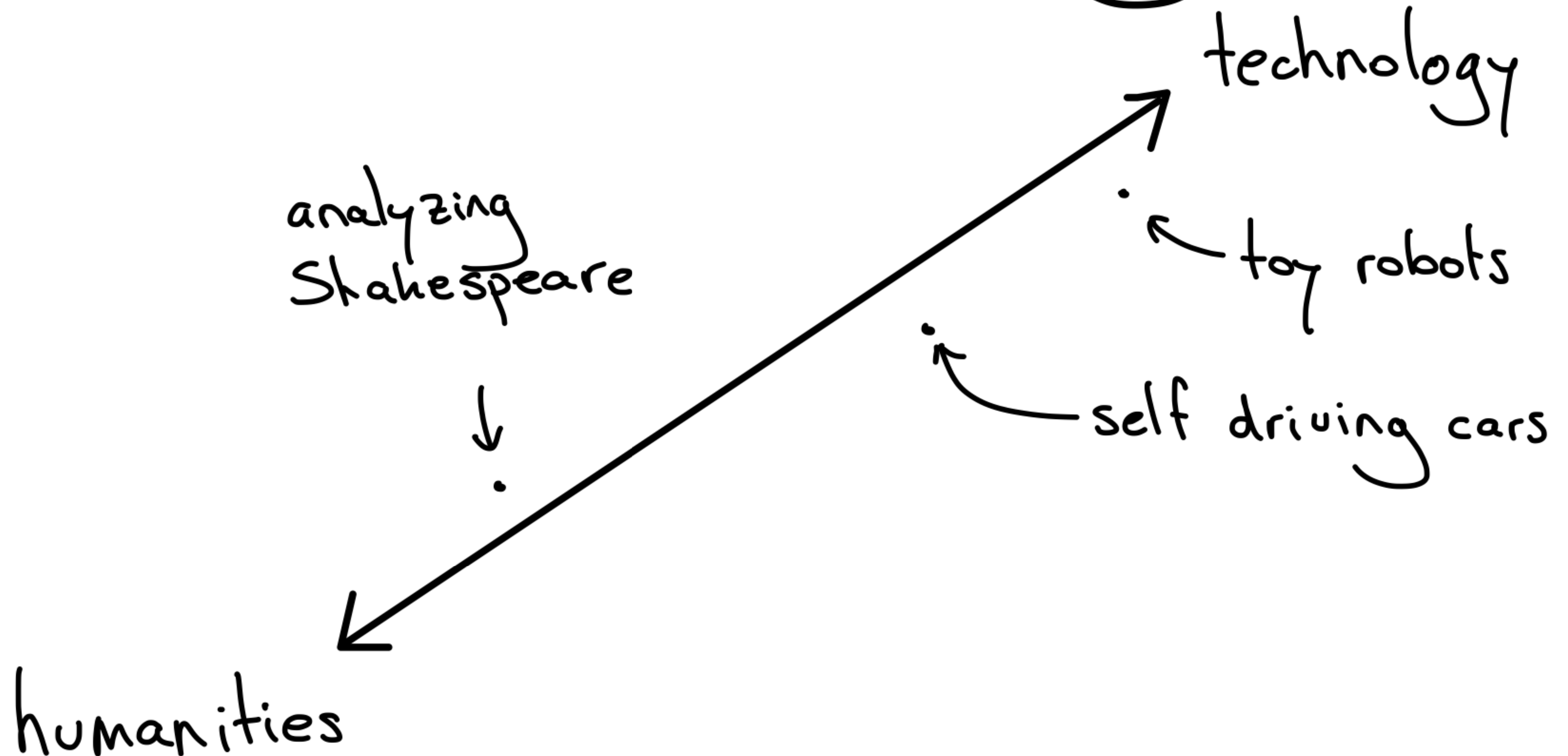
What is programming about?



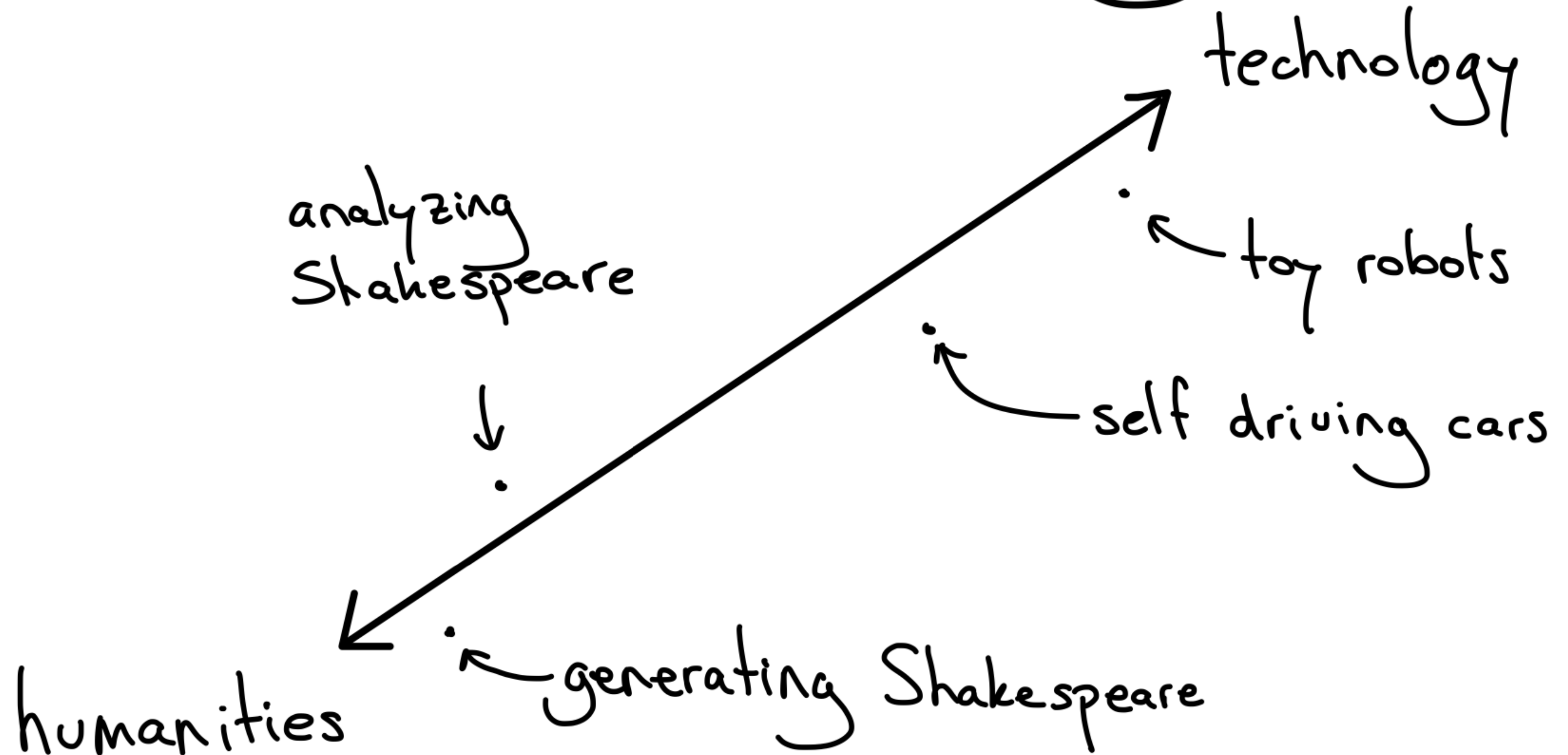
What is programming about?



What is programming about?



What is programming about?



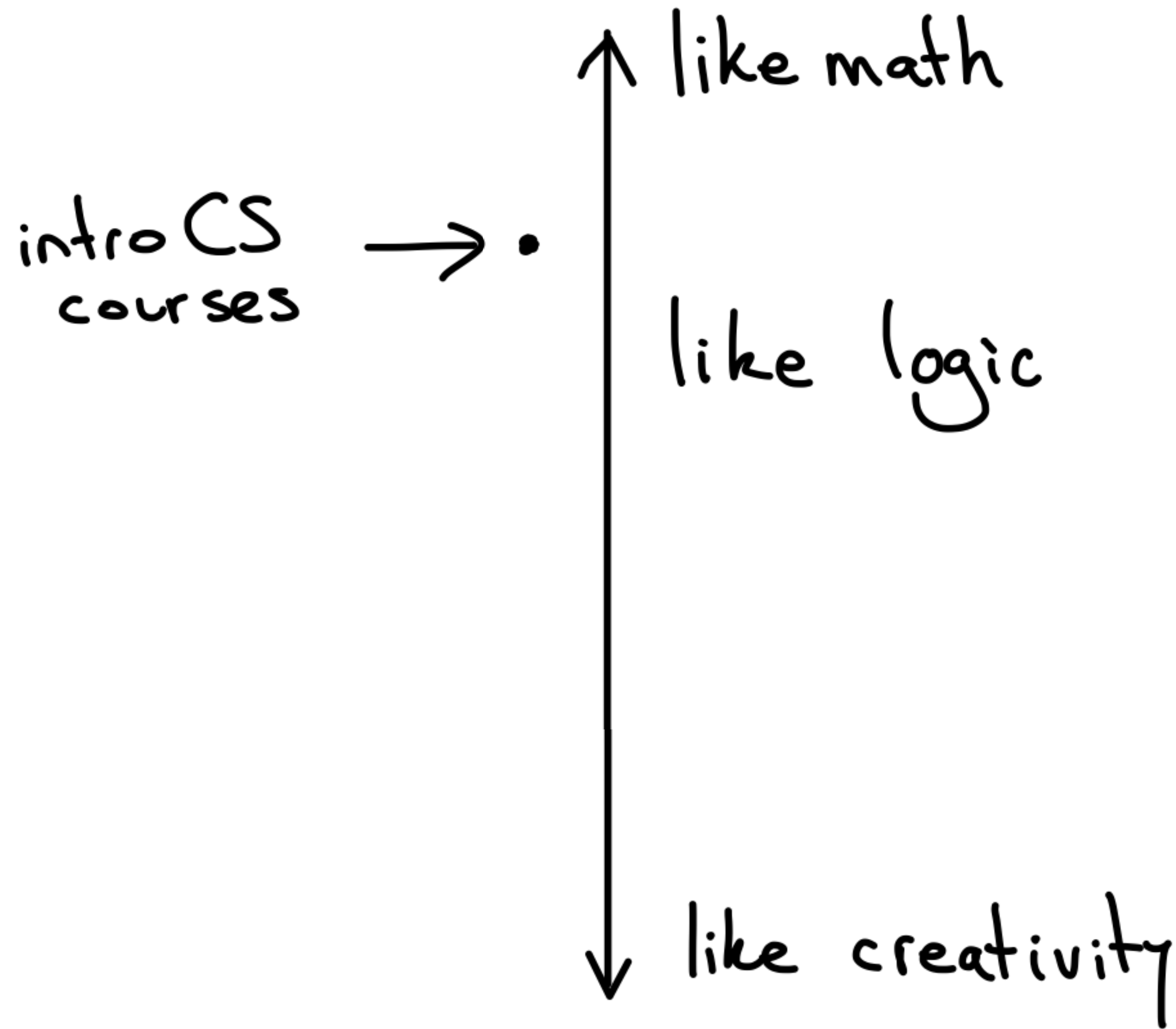
What is programming like?

↑ like math

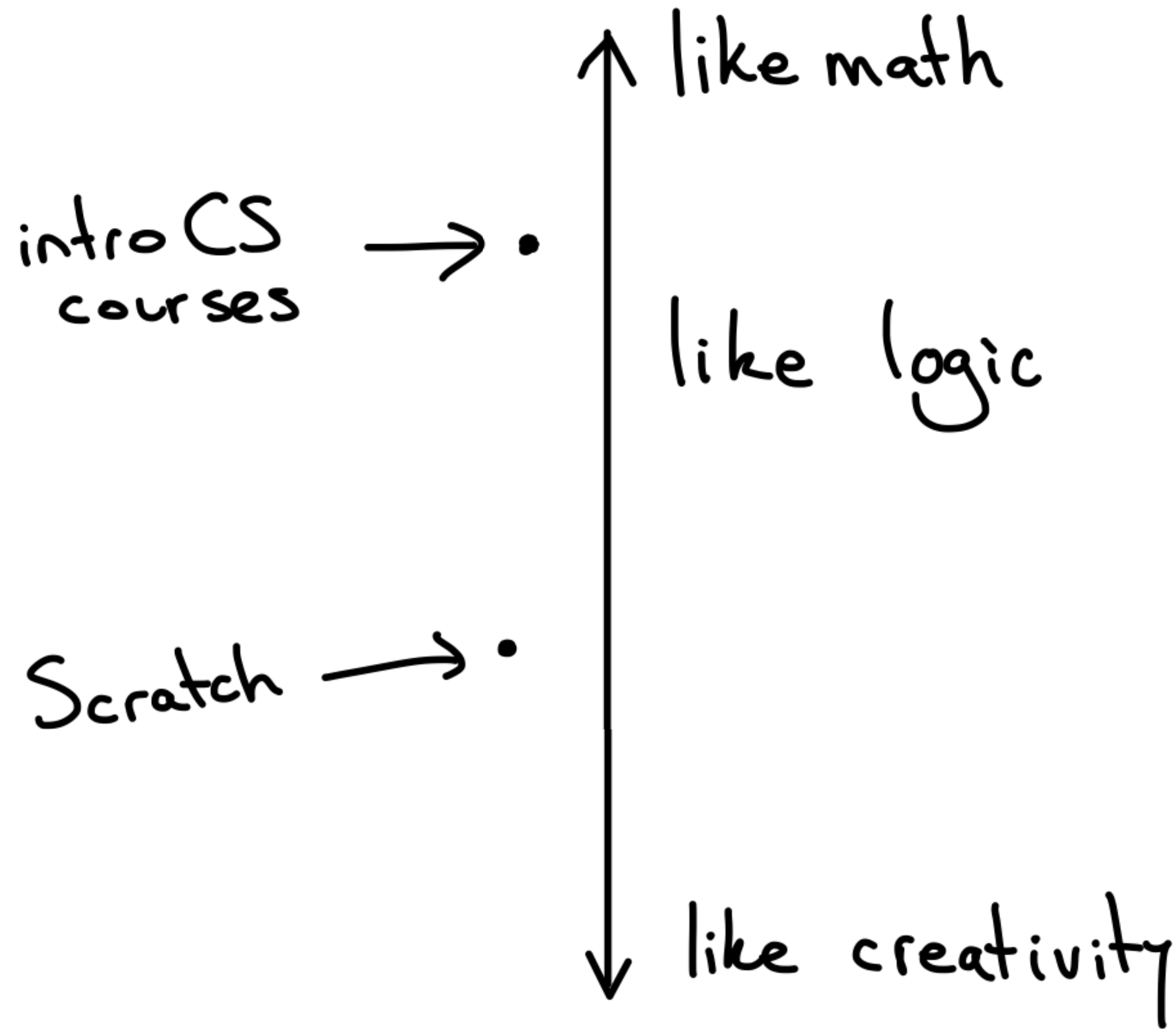
like logic

↓ like creativity

What is programming like?



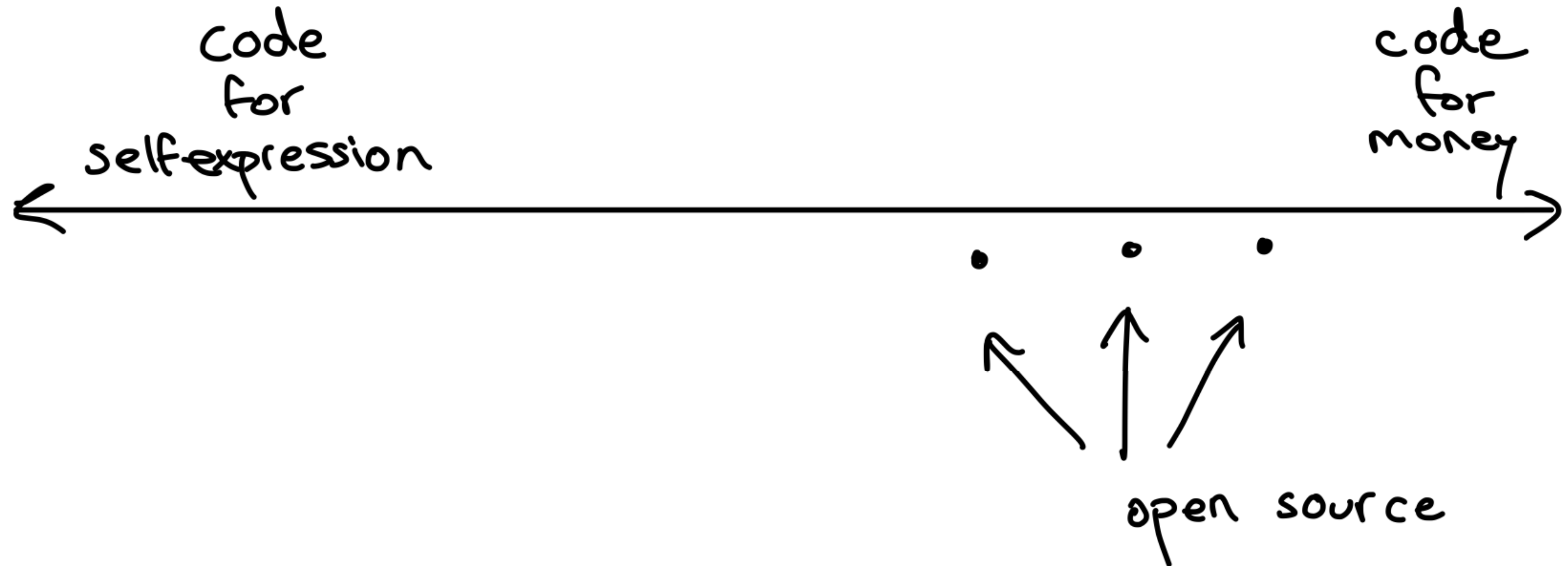
What is programming like?



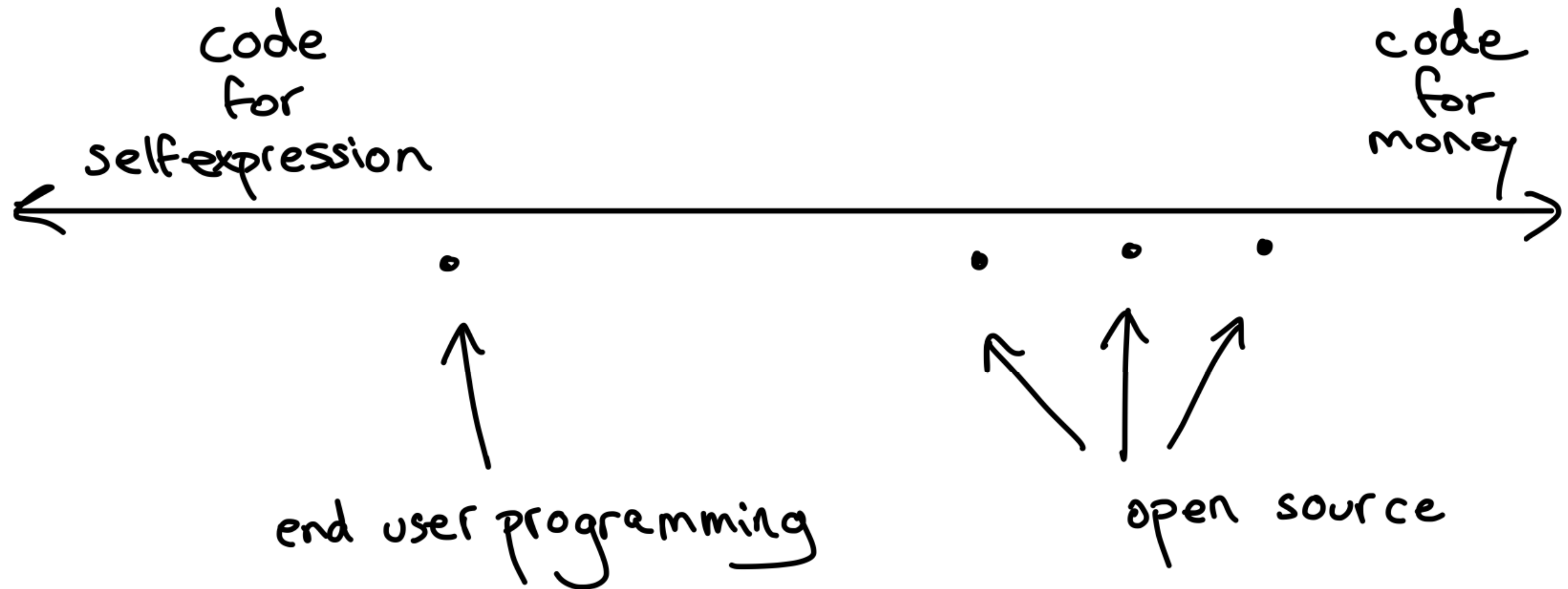
What is programming for?



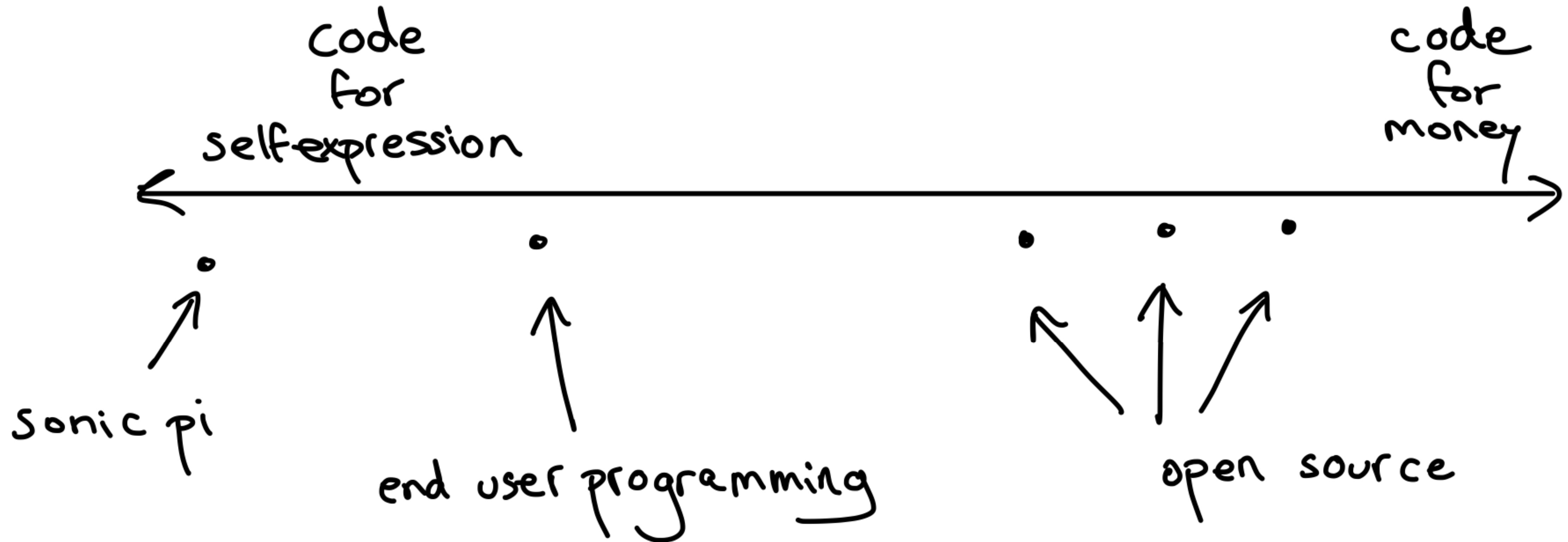
What is programming for?



What is programming for?

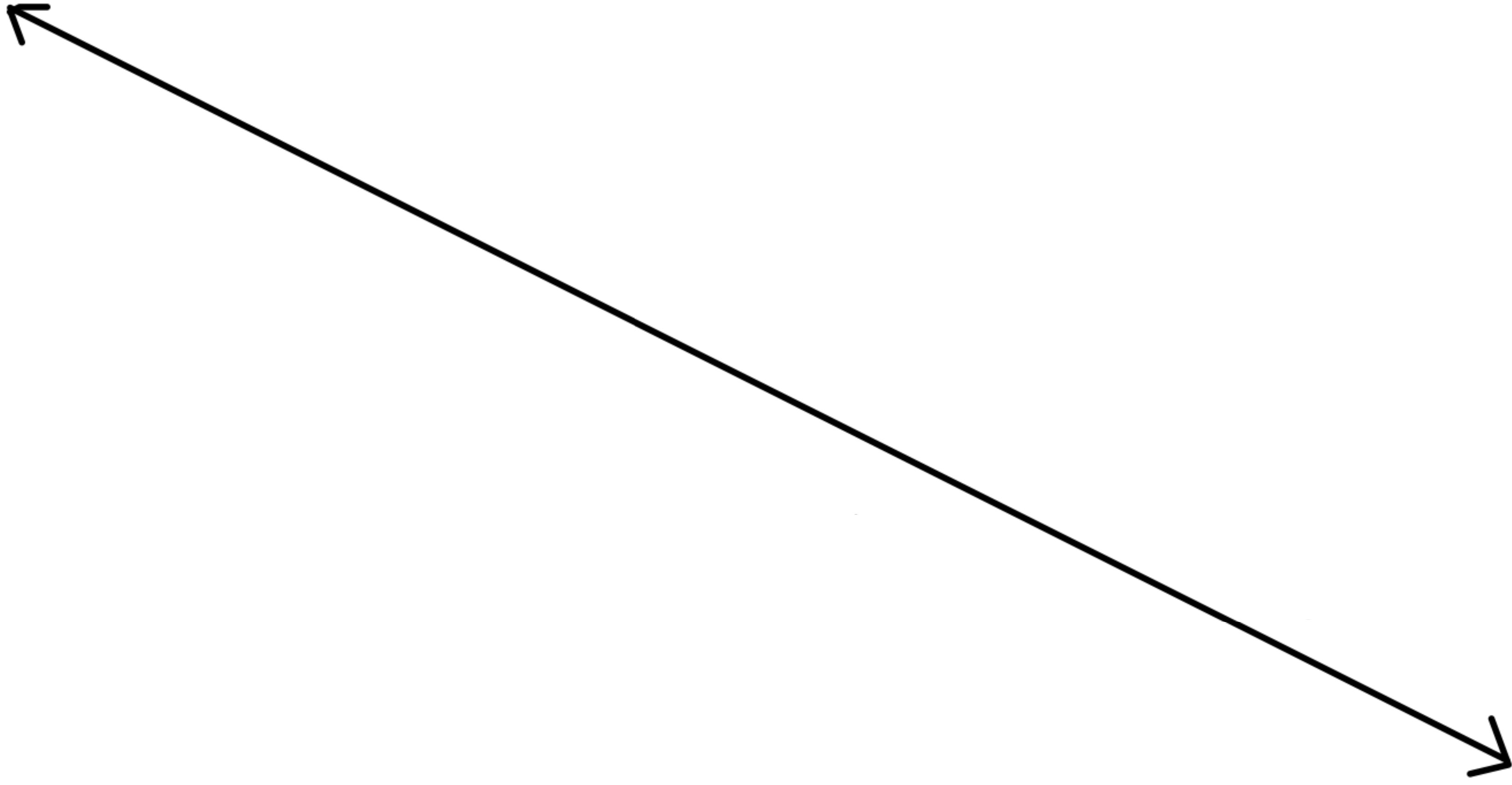


What is programming for?



Who is programming for?

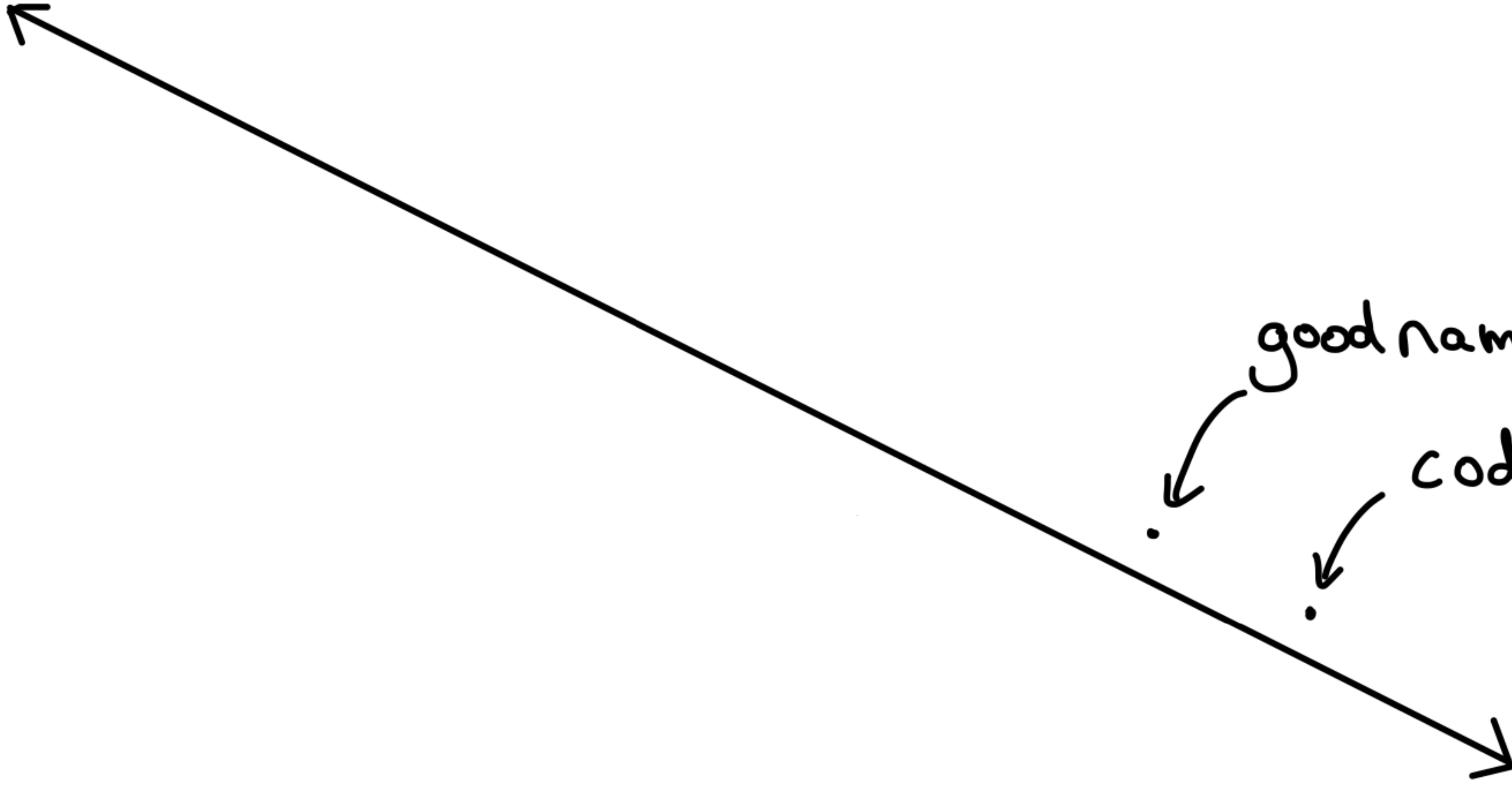
humans



compilers

Who is programming for?

humans

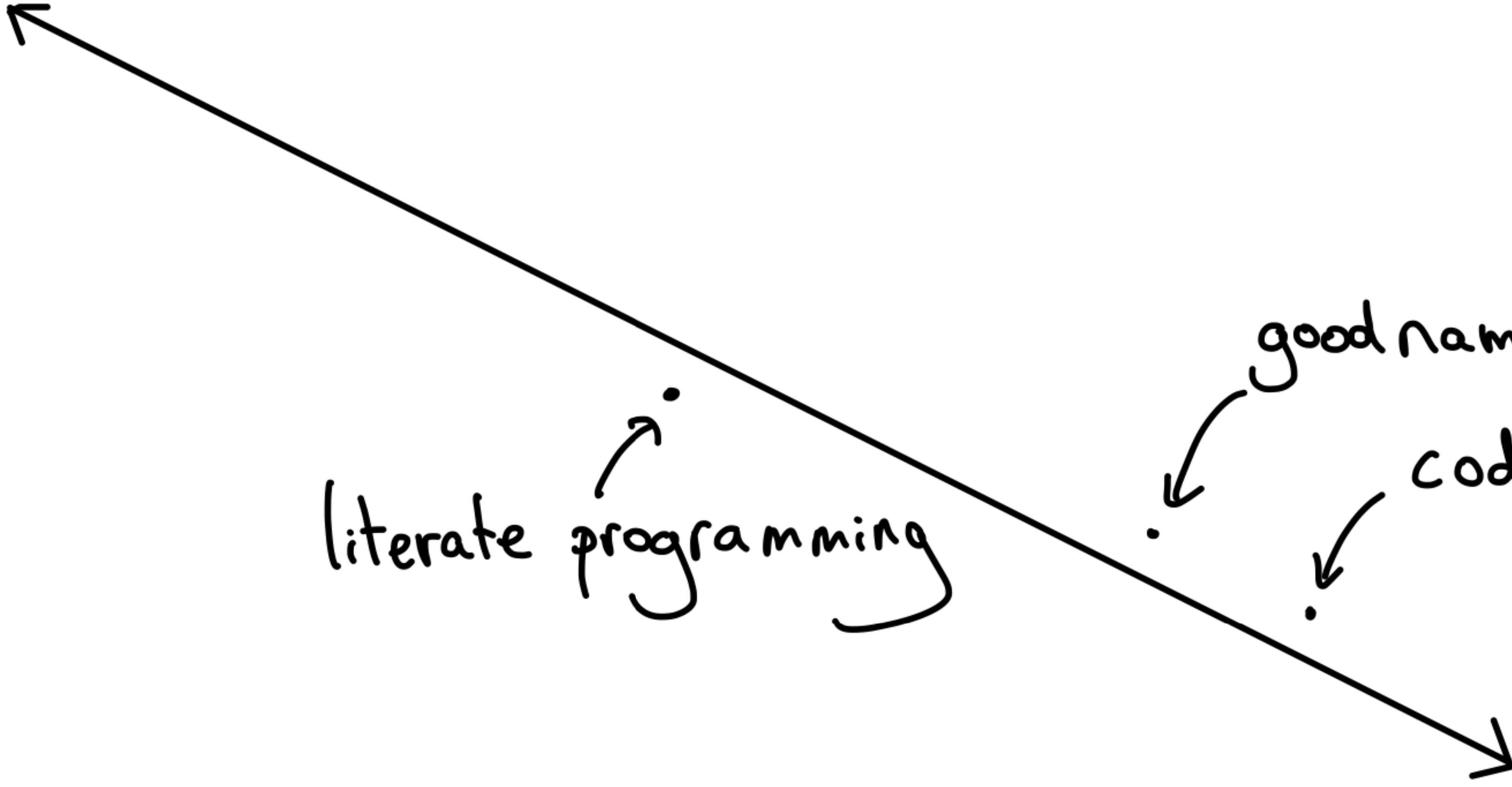


good naming
coding style

compilers

Who is programming for?

humans



literate programming

good naming
coding style

compilers

Who is programming for?

humans

non executable
explorations of
source code

iterate programming

good naming

coding style

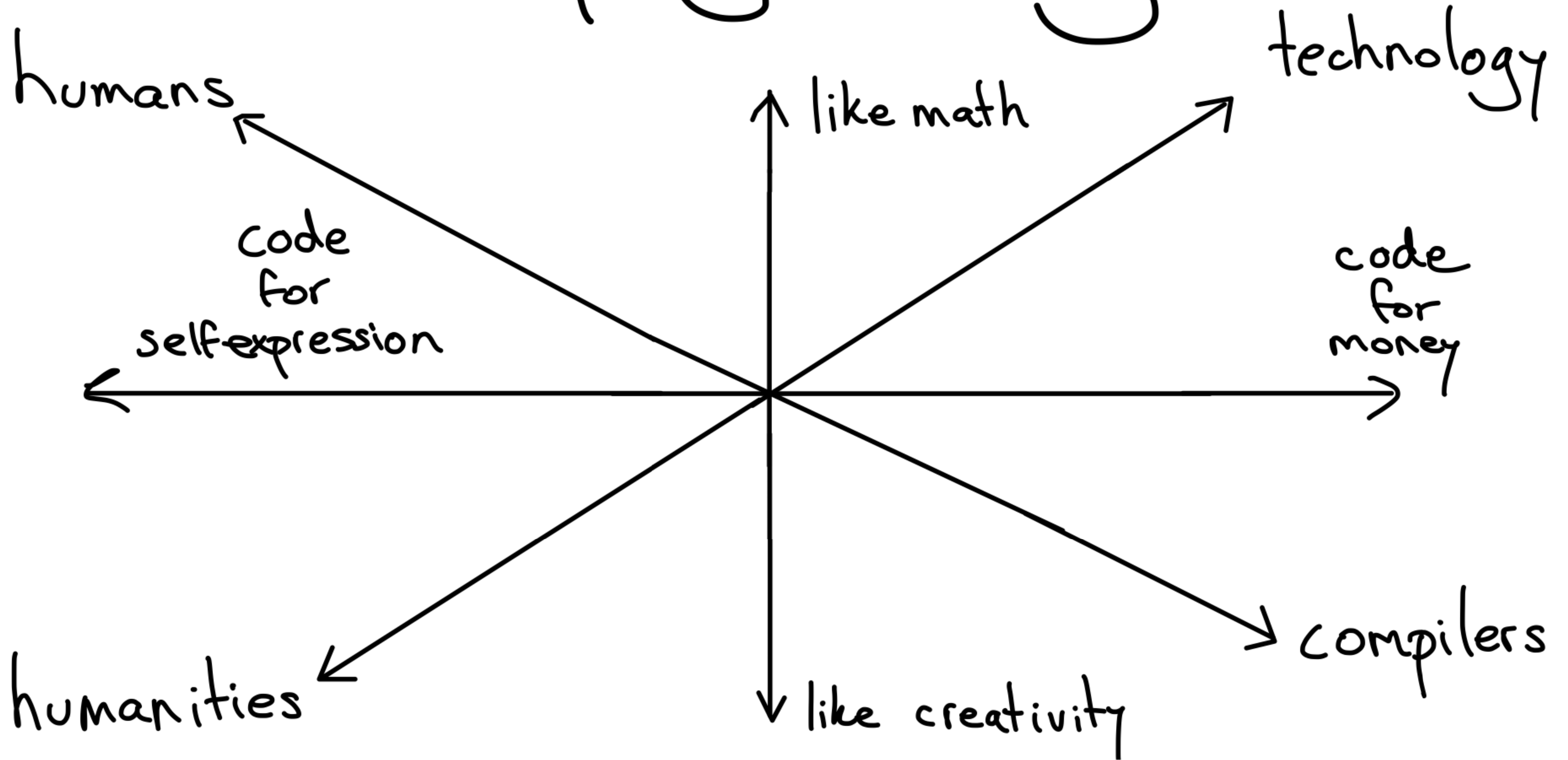
compilers

Who is programming for?

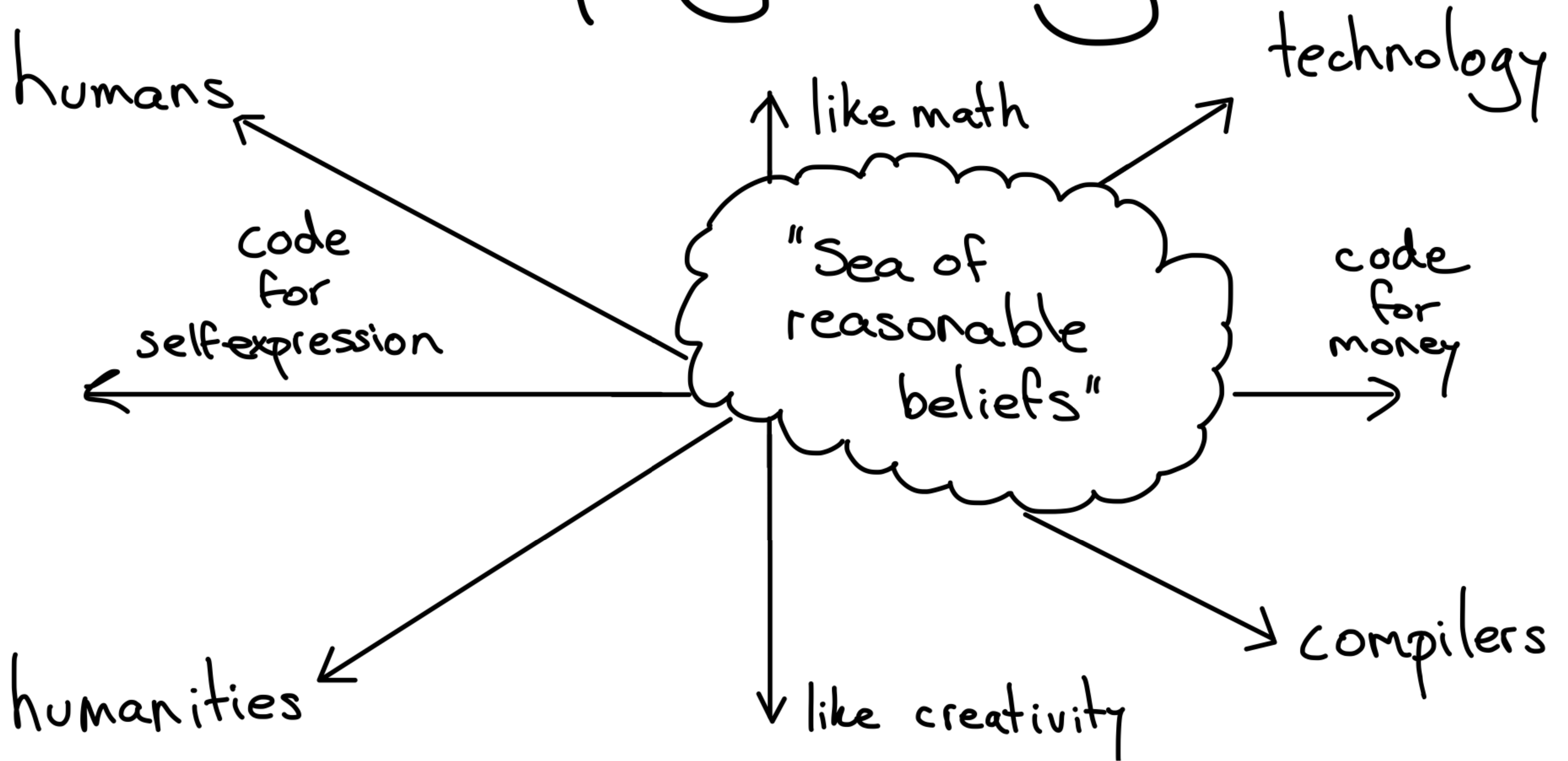
non executable
explorations of
source code

```
__{ _ atomic_noexcept, atomic_commit,  
crumble; public: _ corpse; char covering, crushed; _ carbon()  
{switch (2); _ chickens, combining, carrots, corn, caesium,  
caramalised, calluses;} protected: _ cerebellum, cells,  
corporal, cast, captures, cooling, cripples,  
cupids; _ charcoal(){static_cast<_>(1); _ clutches, cute, clouds;  
}explicit __(){_ calculations;}}; class collateral{ _ capture,  
comic, cretins, carry, synchronized, cancers,  
call, central, cabin; _ cue(){C( cello, 4){ continue;  
}} _ atomic_cancel;}; _
```

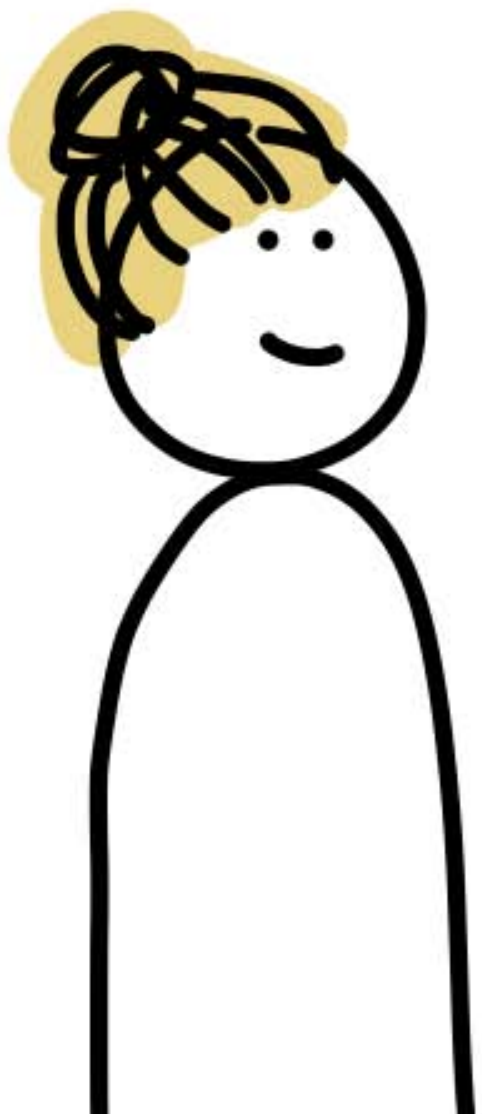
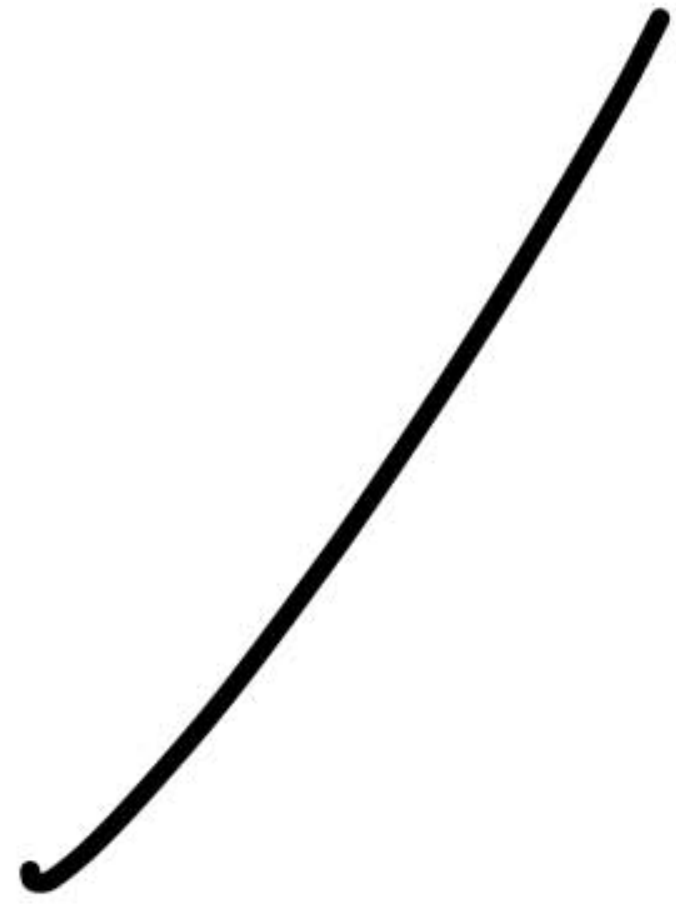
What is programming?



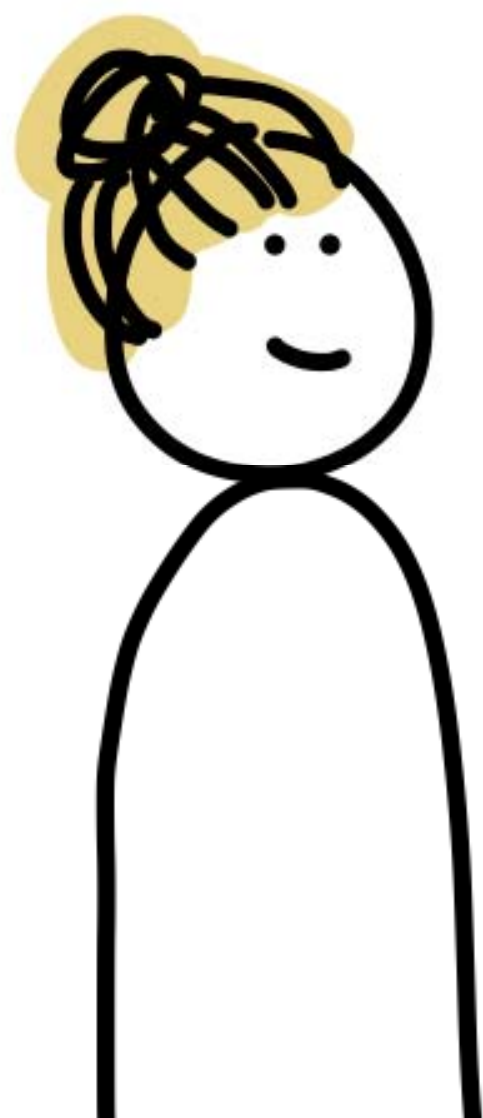
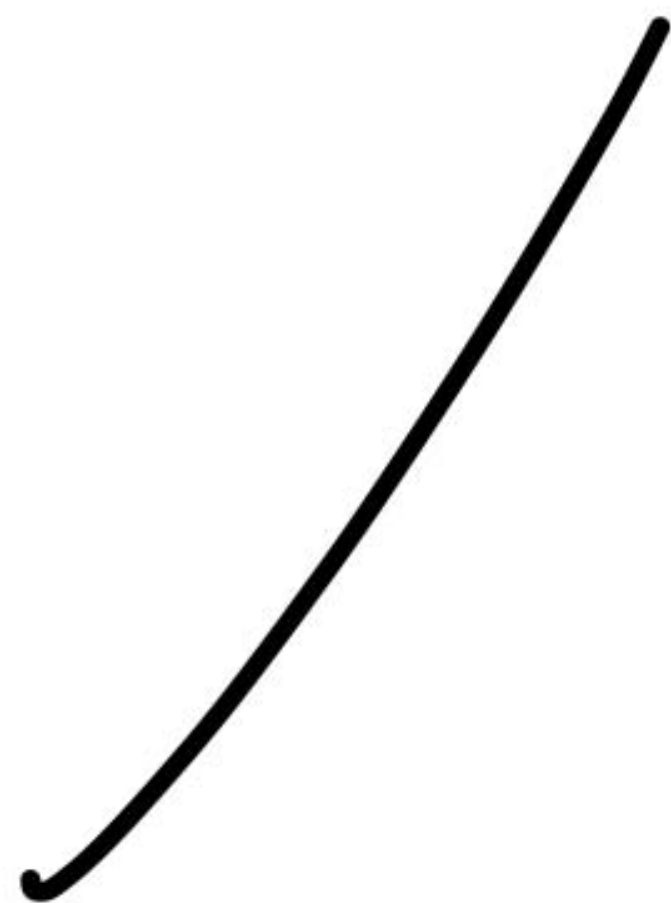
What is programming?



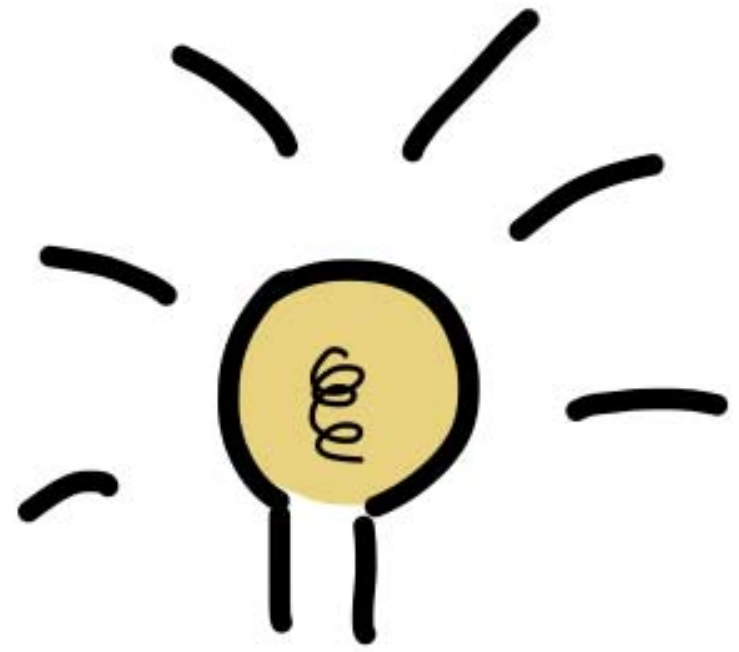
What is programming?



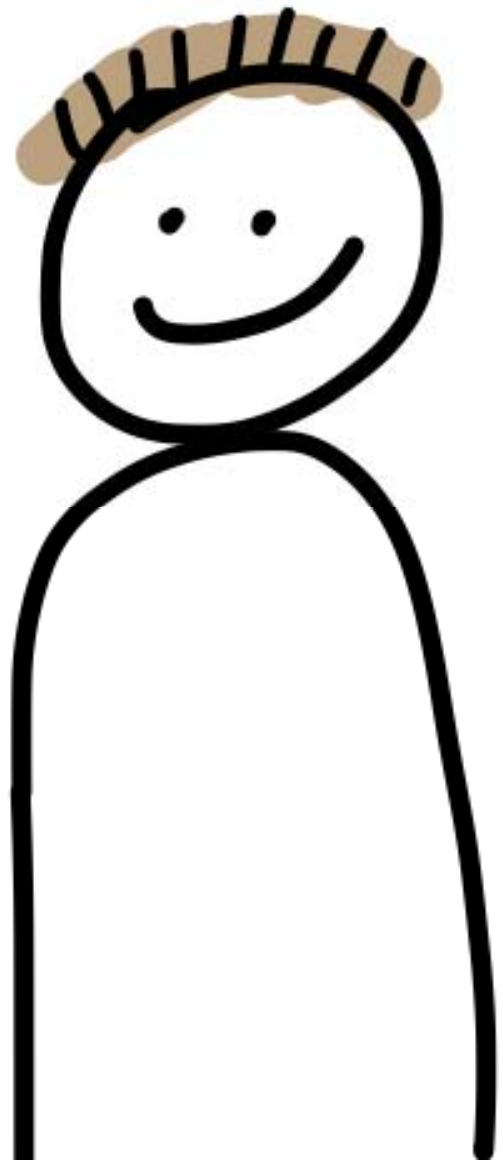
Programming is Writing



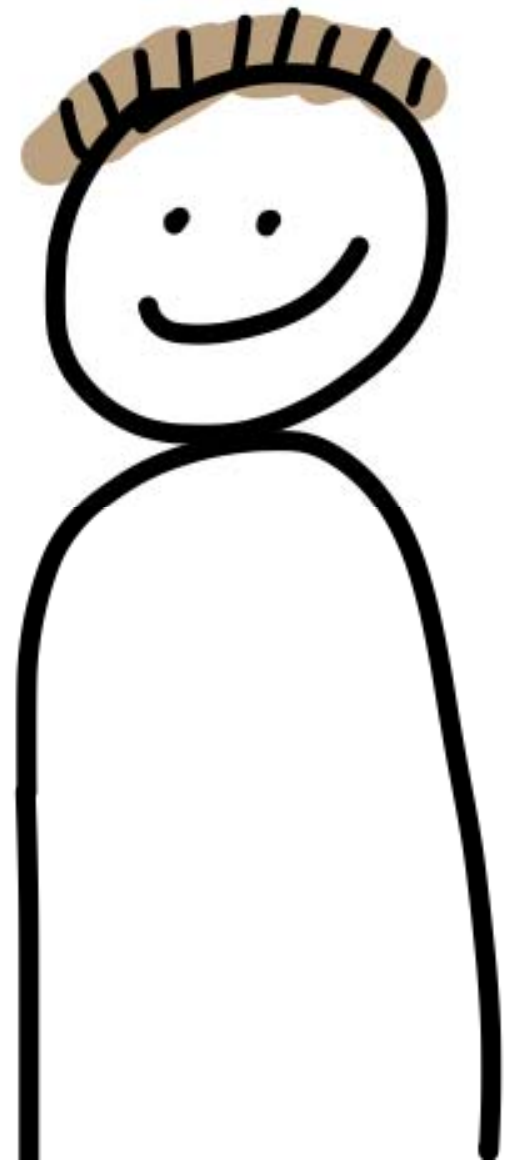
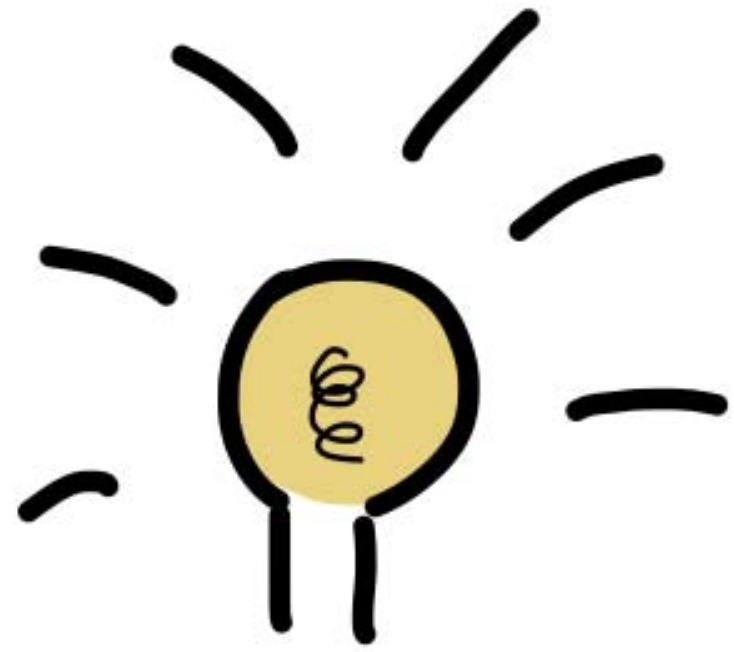
Programming is Writing



An app that
tracks compliments

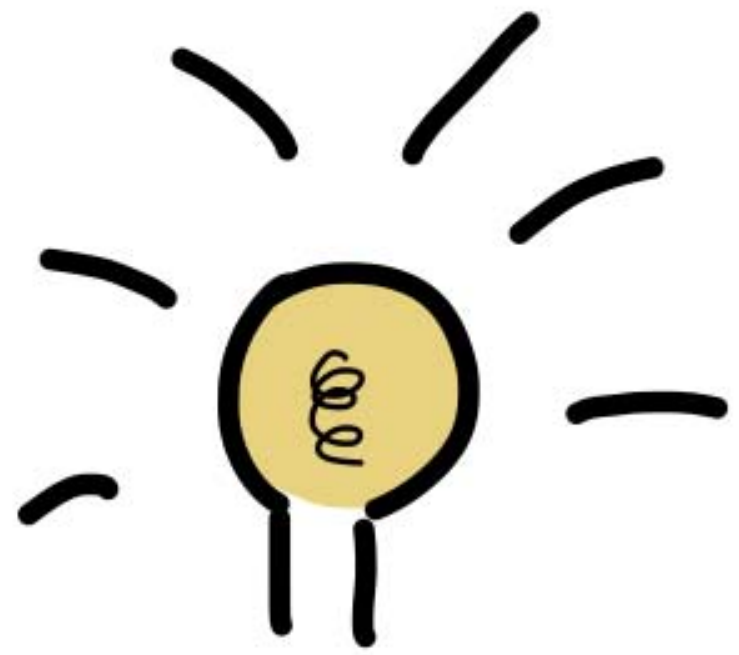


Programming is Writing

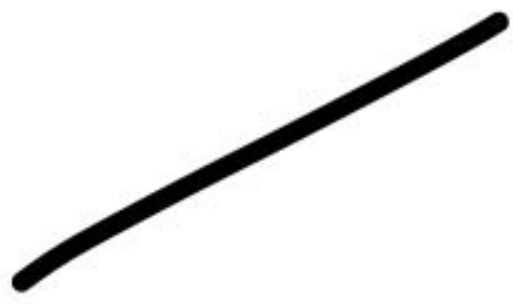
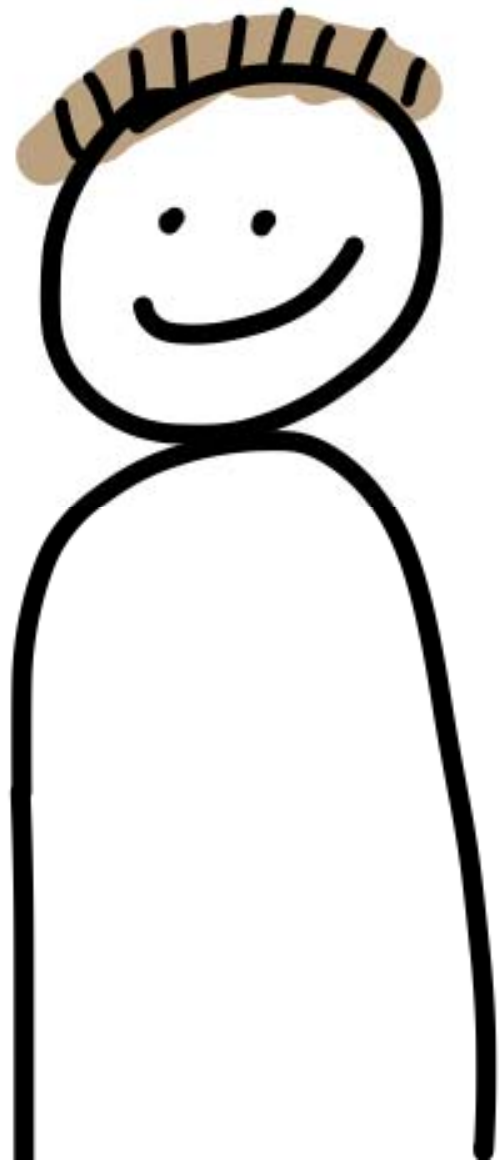


```
if compl.count  
> 5  
  print "Hooray"  
else  
  print "So sad"
```

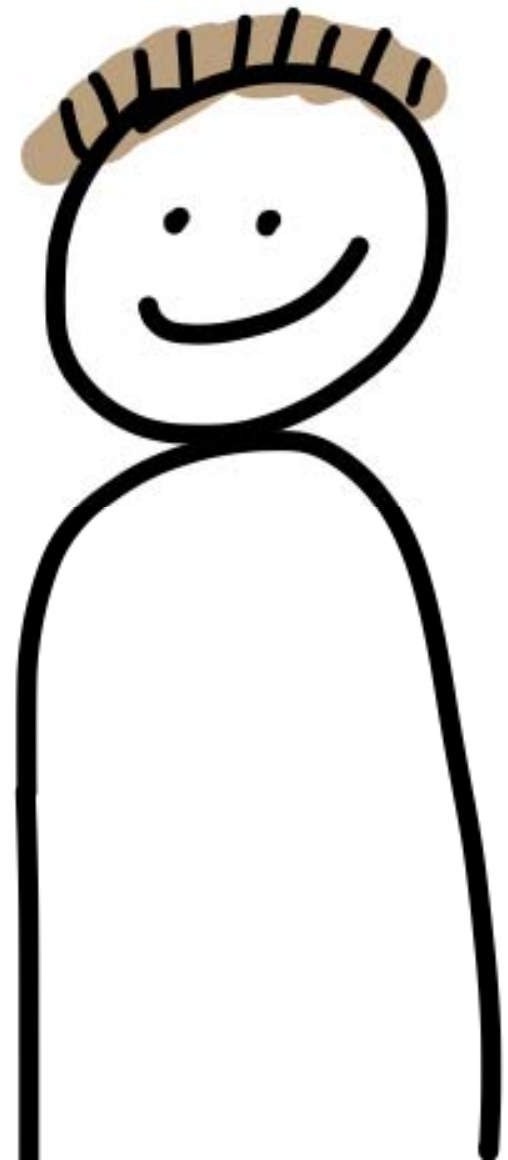
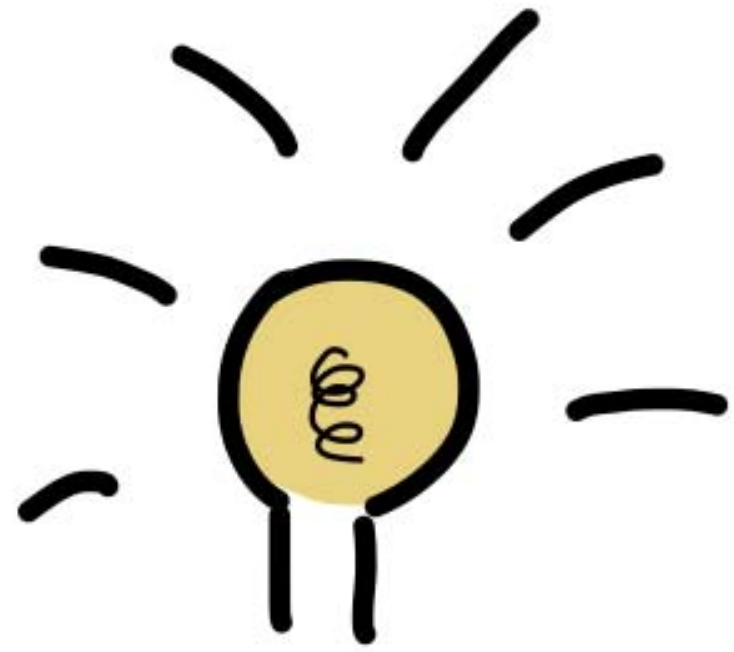
Programming is Writing



A frog murders
foreign diplomats



Programming is Writing



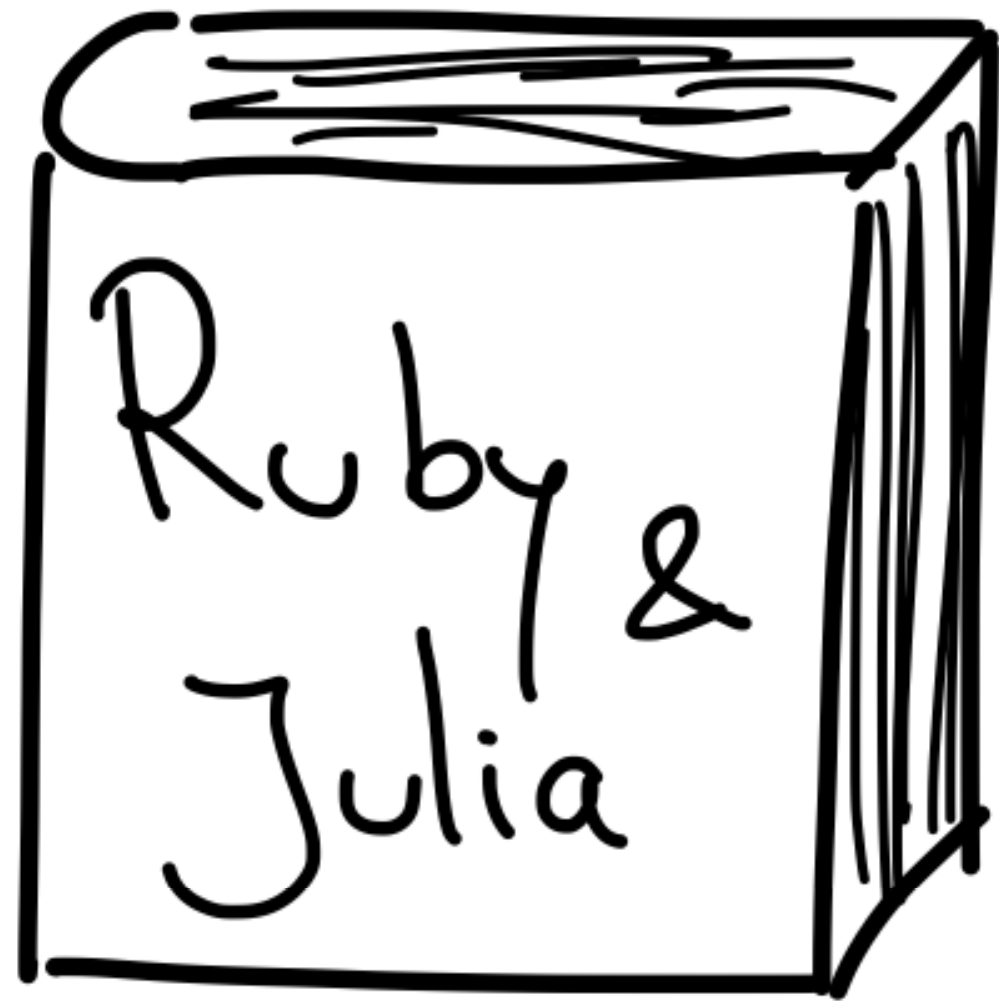
That was the day that Frits the frog decided to leave the pond

What is writing?

What is writing?



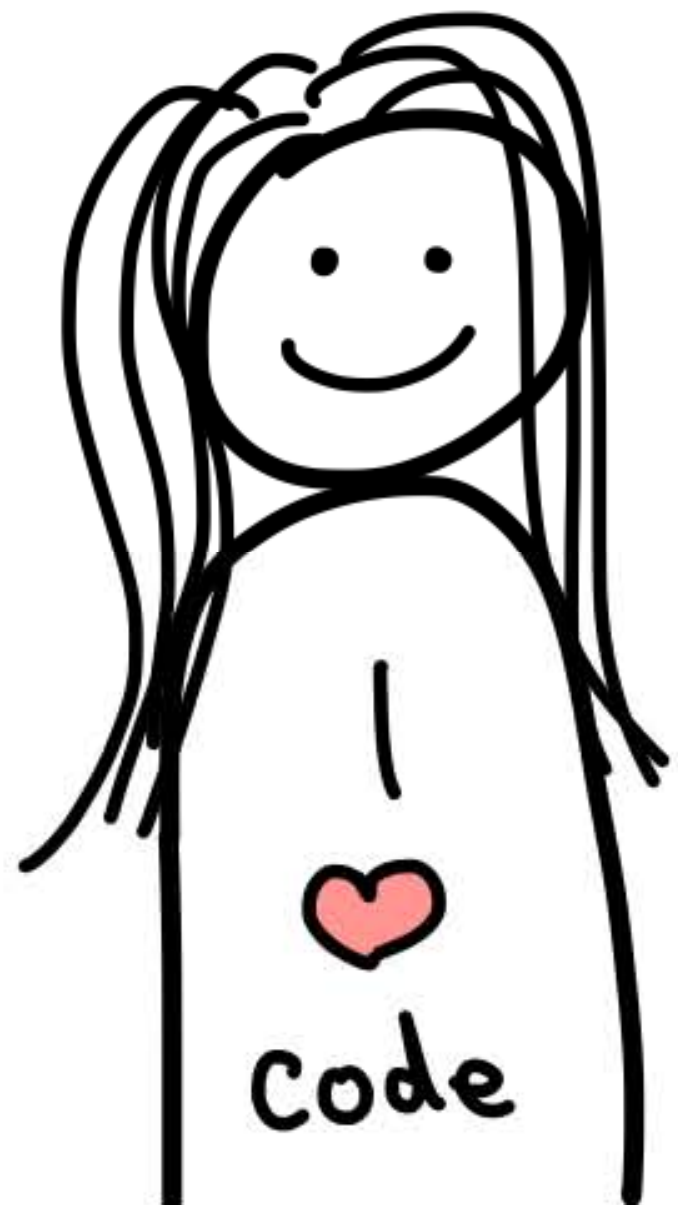
Language metaphor helps



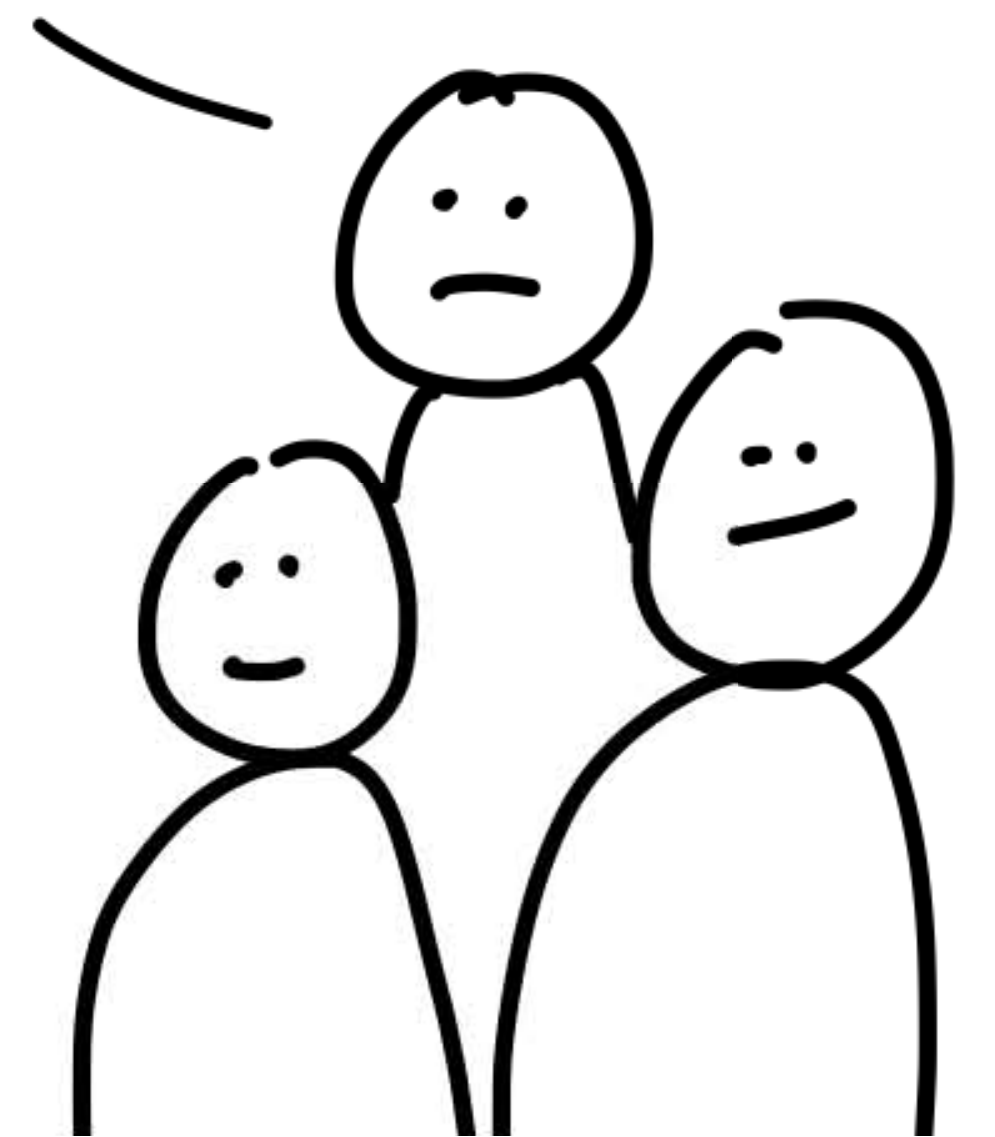
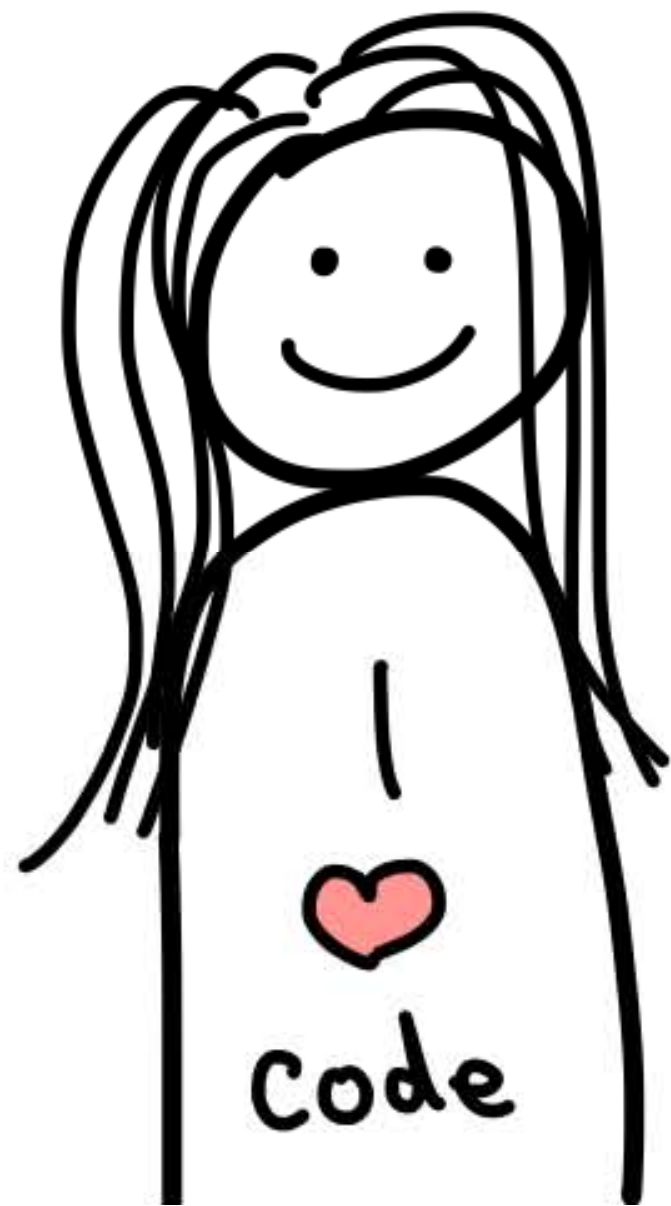
=



Everyone can learn it

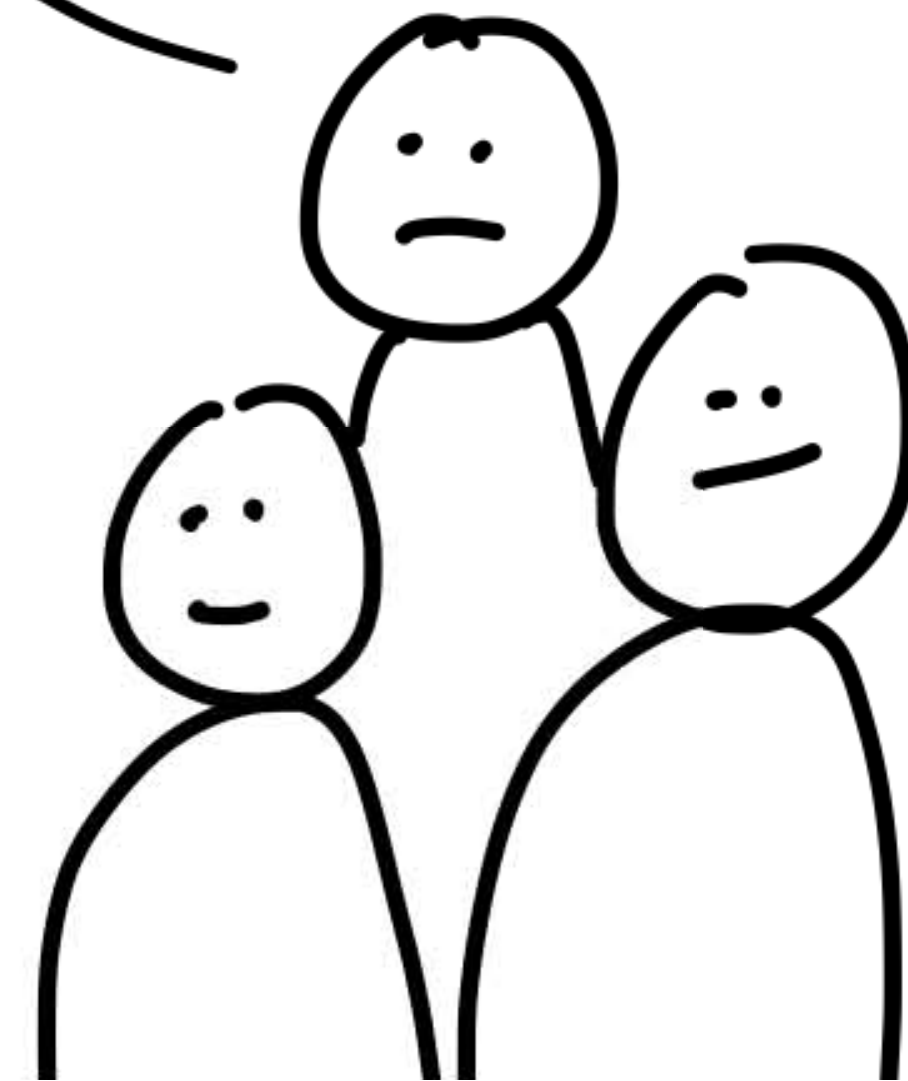
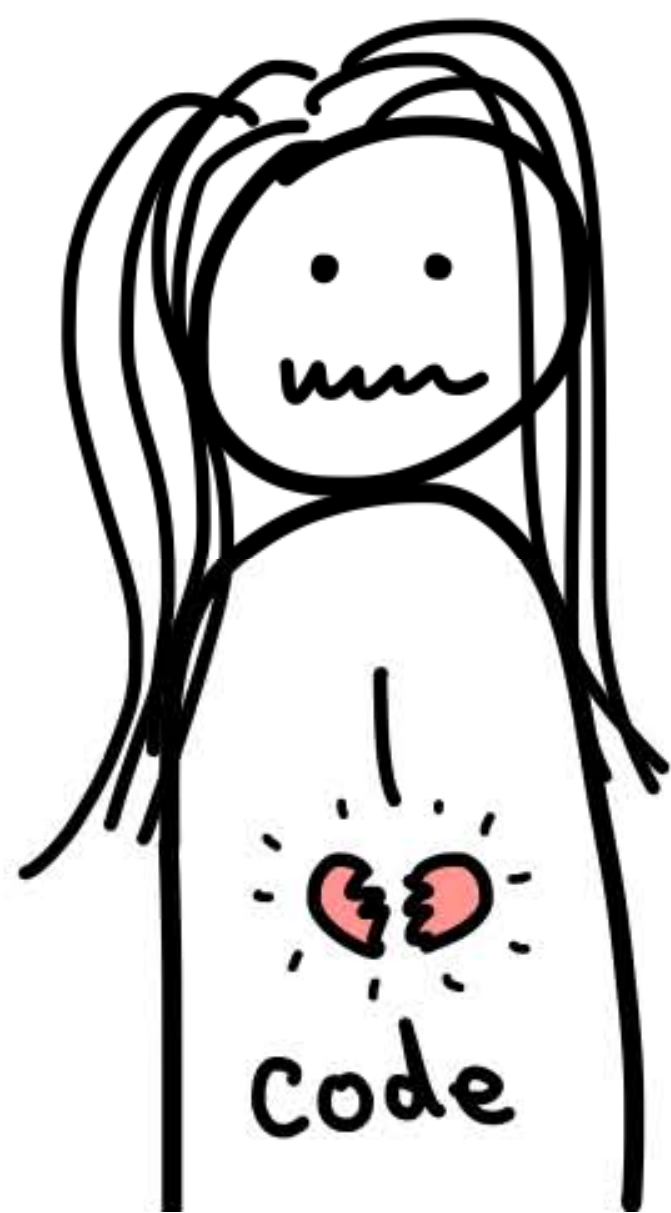


Programming
is
math



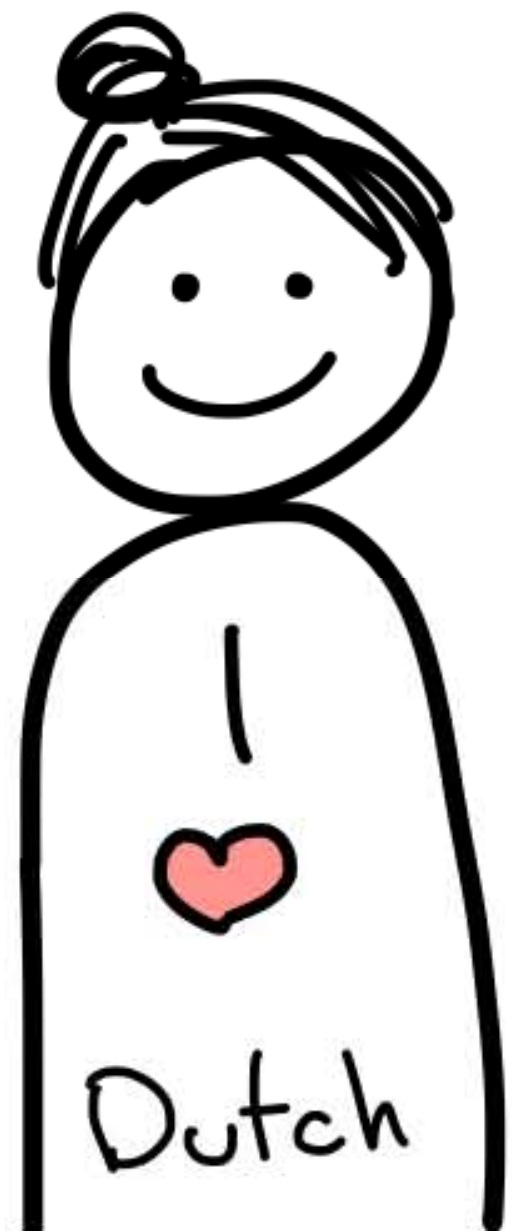
Programming
is
math

not for me



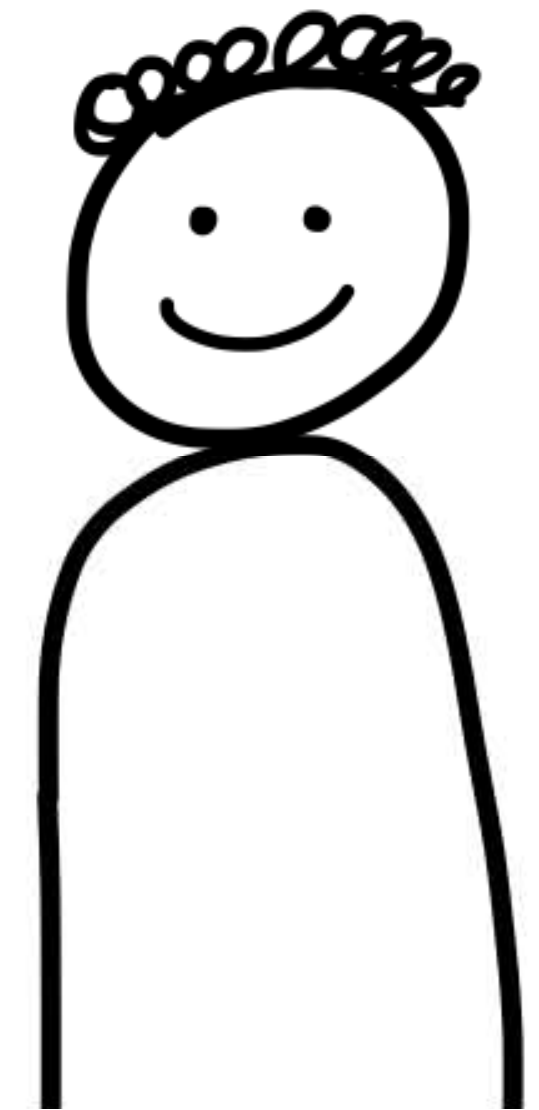
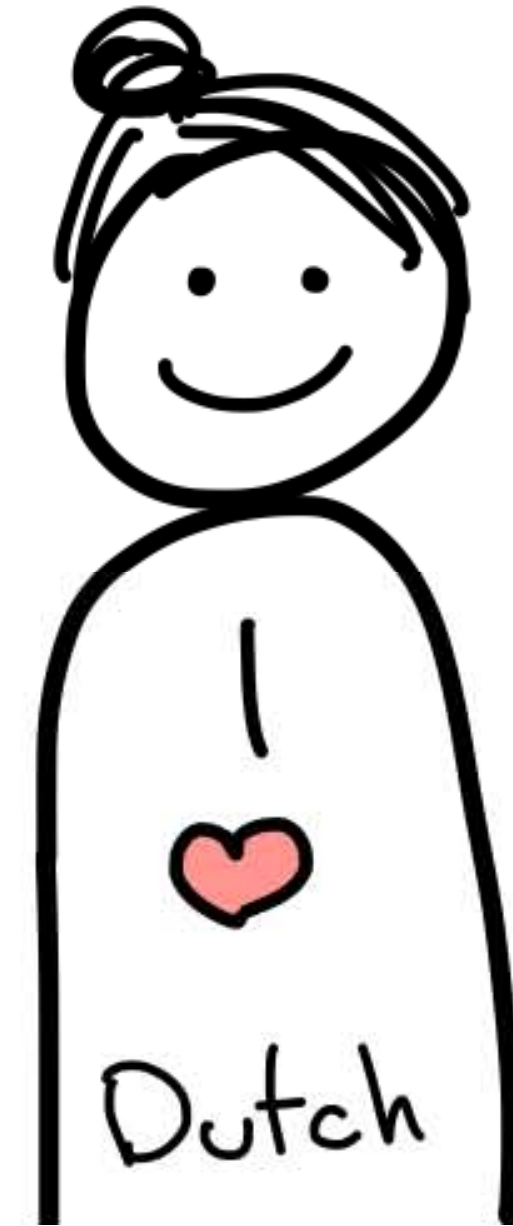
Some stuff makes no sense

"I read a book"

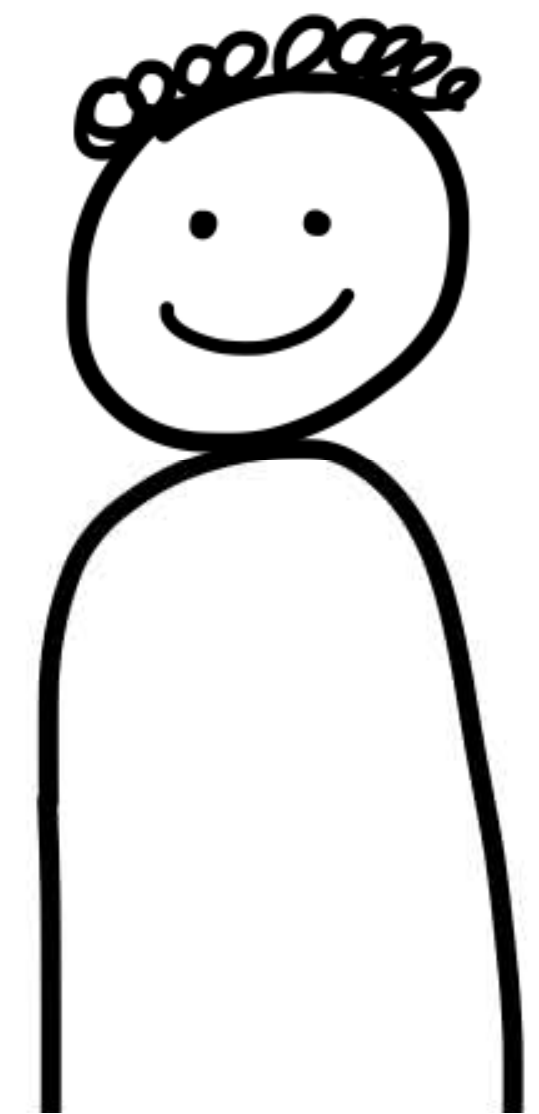
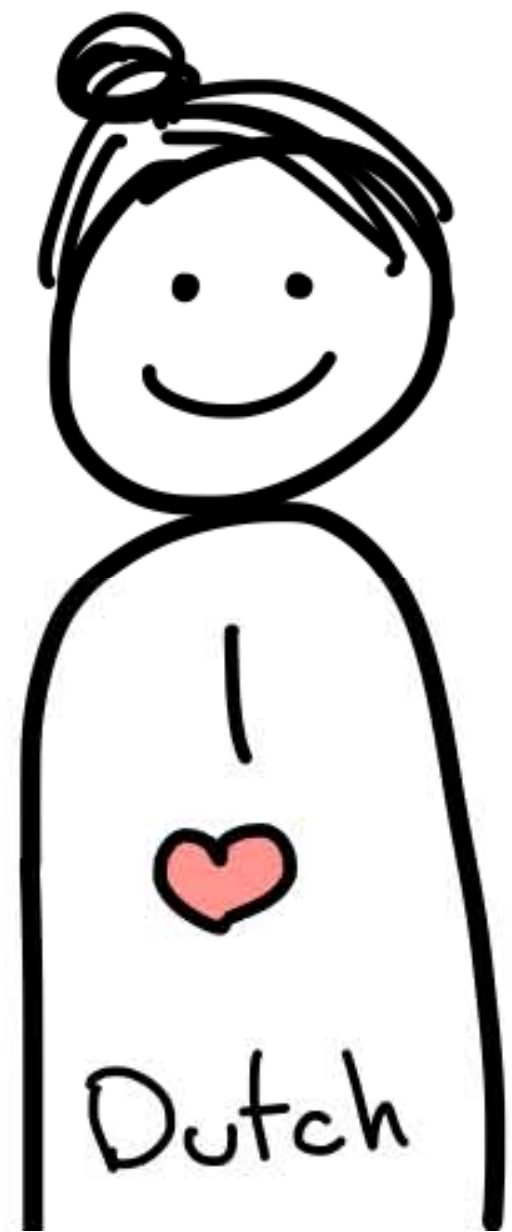


"I read a book"

well done!

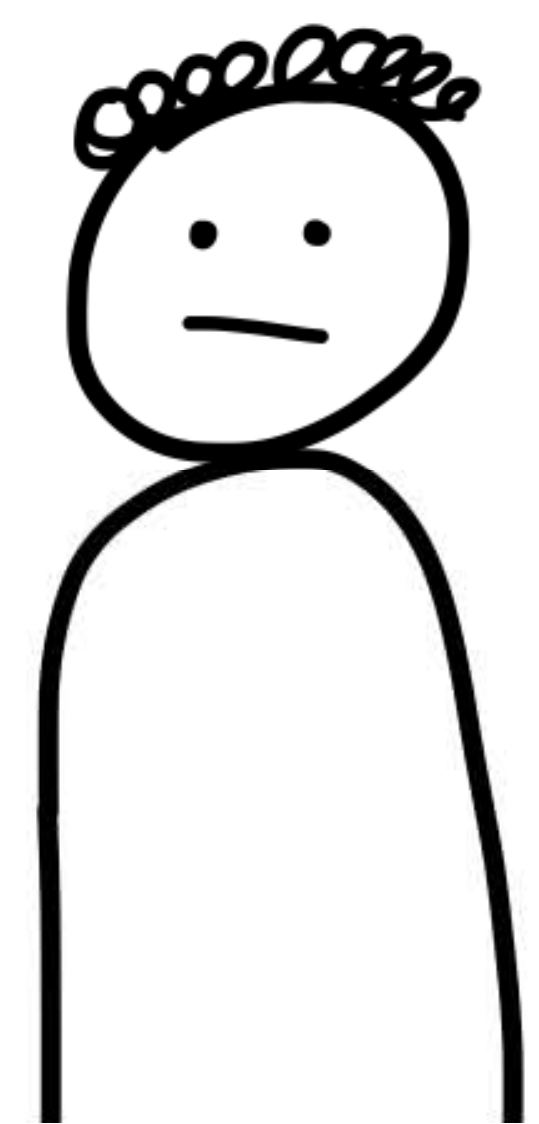
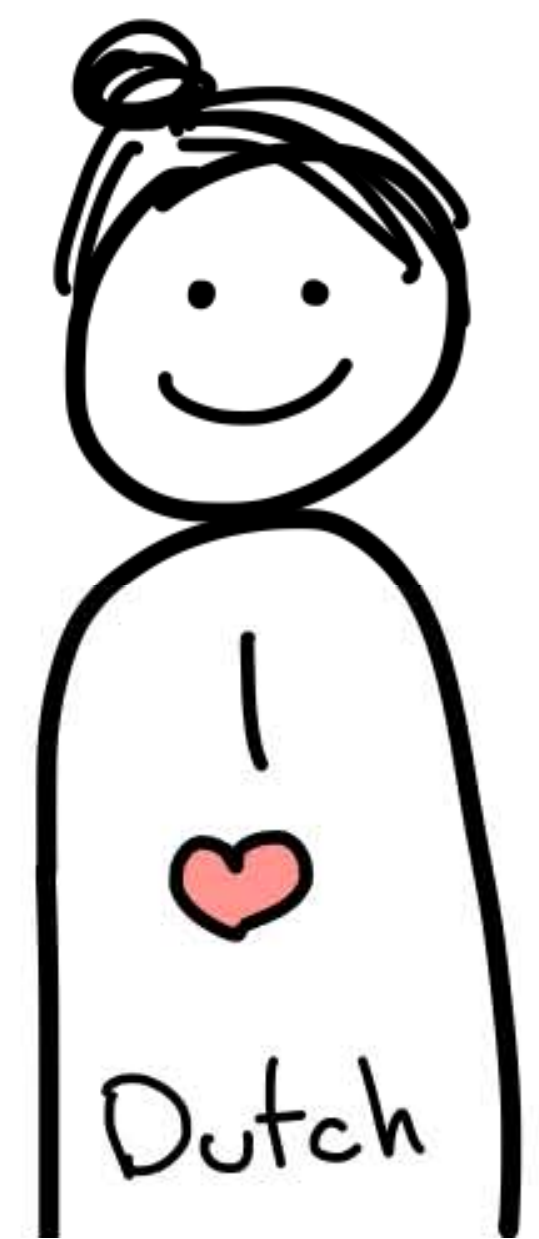


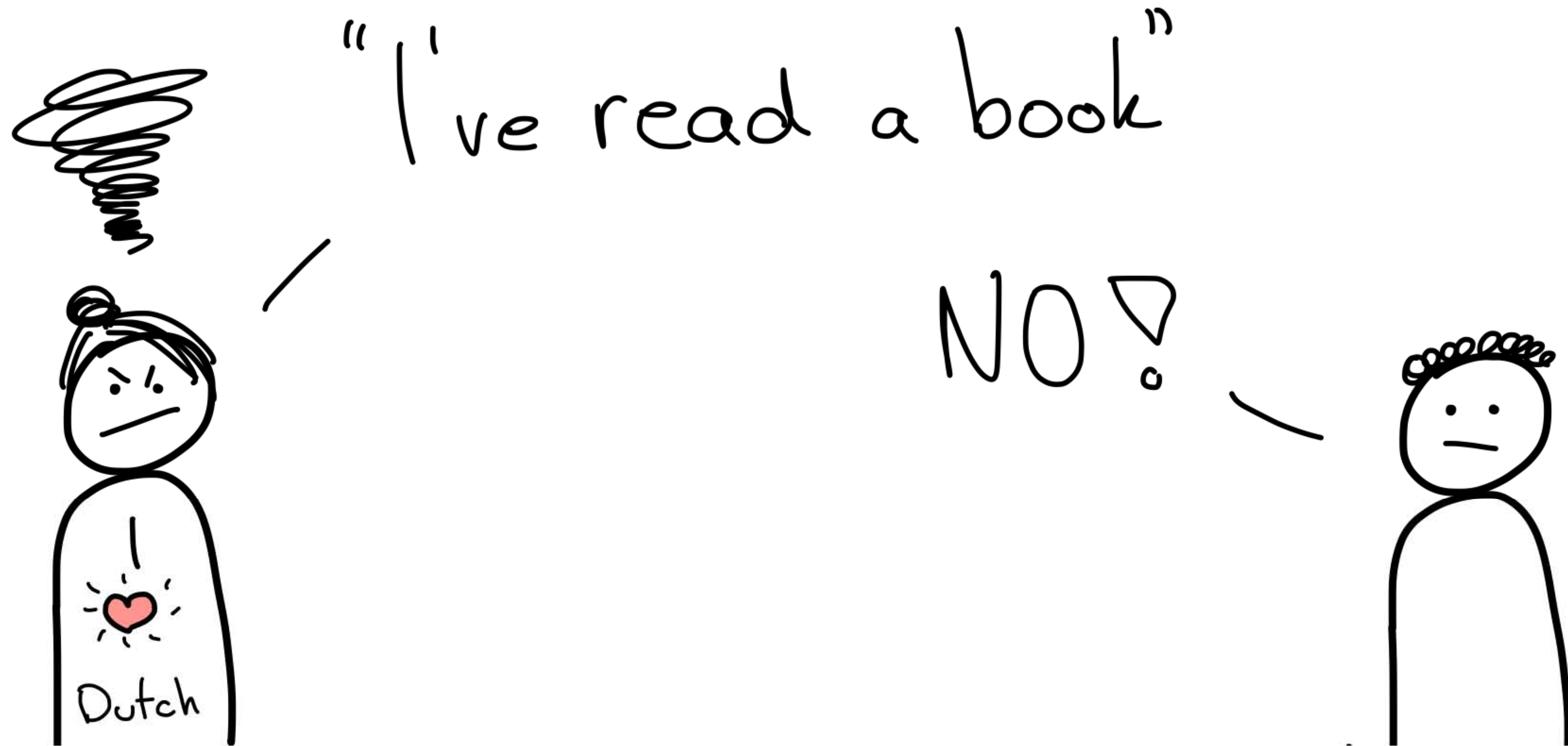
"I've read a book"



"I've read a book"

NO!



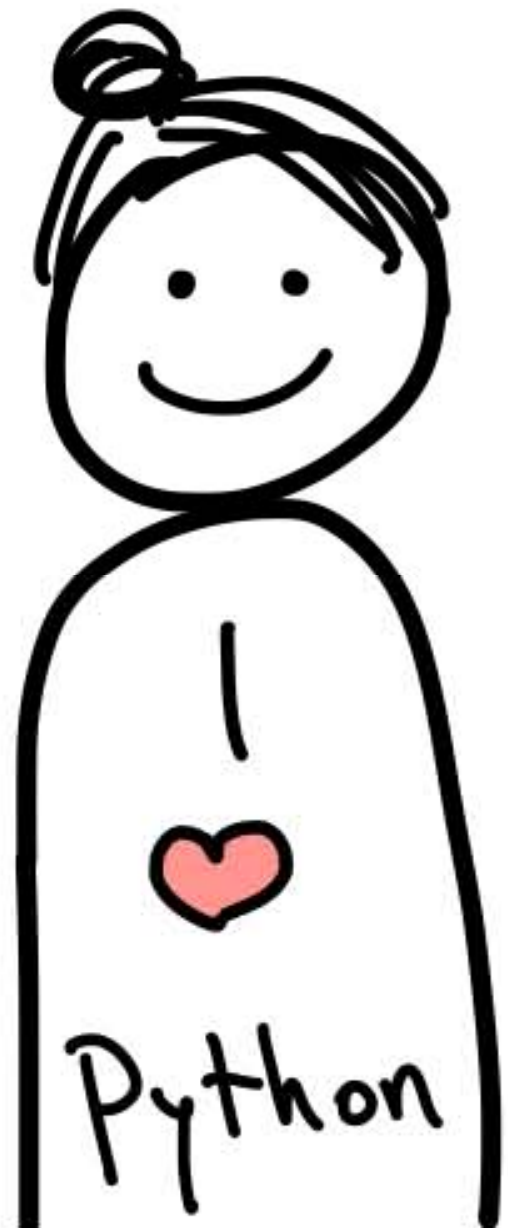


"I've read a book"

NO!

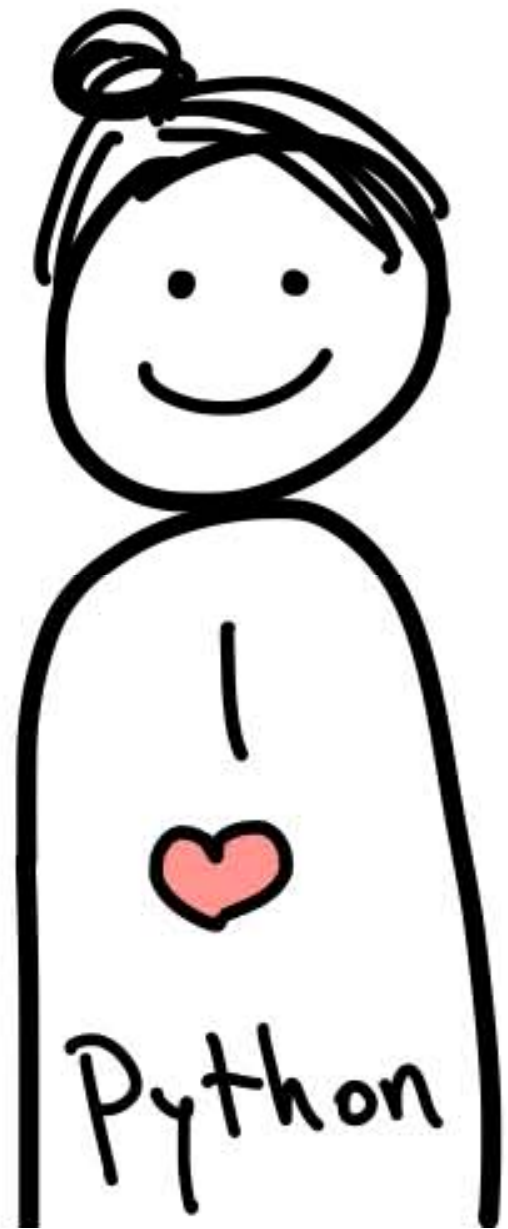
Dutch

Some stuff makes no sense



```
squares = []  
for i in range(5):  
    squares.append(i*i)  
  
also_squares = [i*i for i in range(5)]
```

Some stuff makes no sense



```
squares = []  
for i in range(5):  
    squares.append(i*i)
```

```
also_squares = [i*i for i in range(5)]
```

Some stuff makes no sense

WHY??

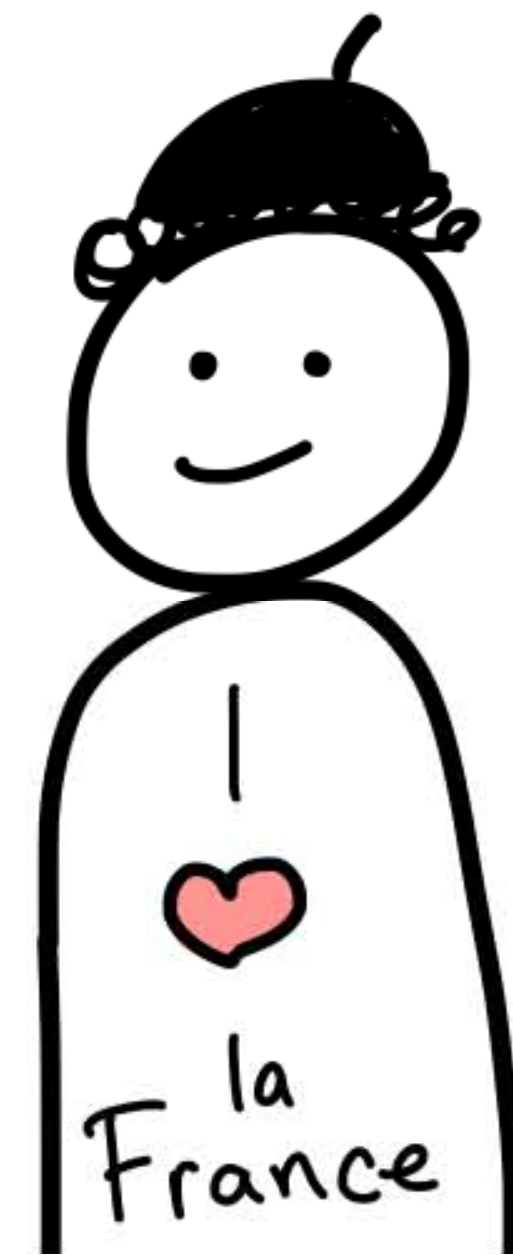
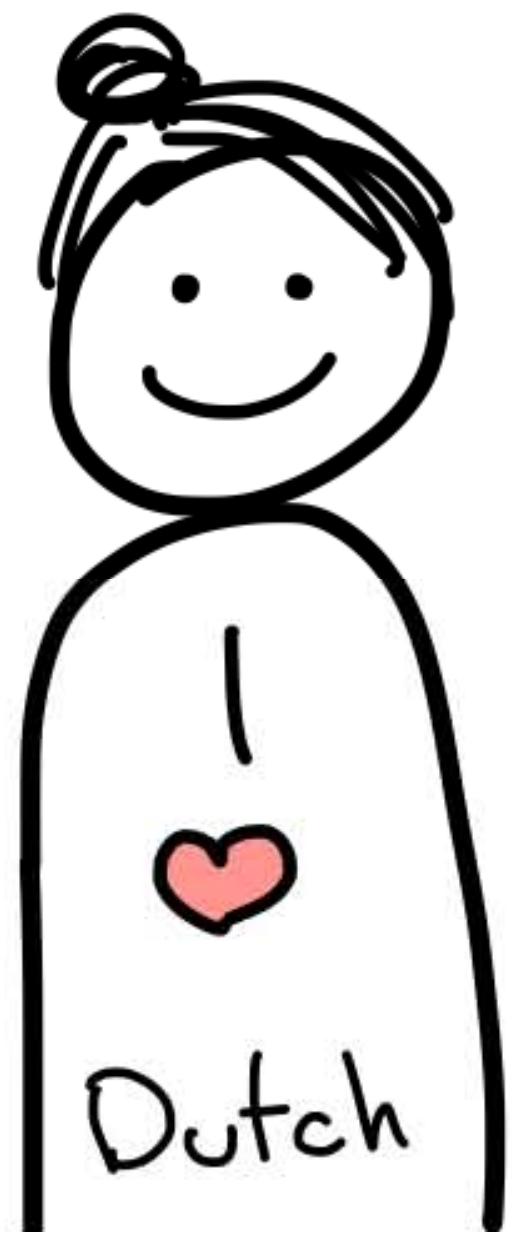


```
squares = []  
for i in range(5):  
    squares.append(i*i)
```

```
also_squares = [i*i for i in range(5)]
```

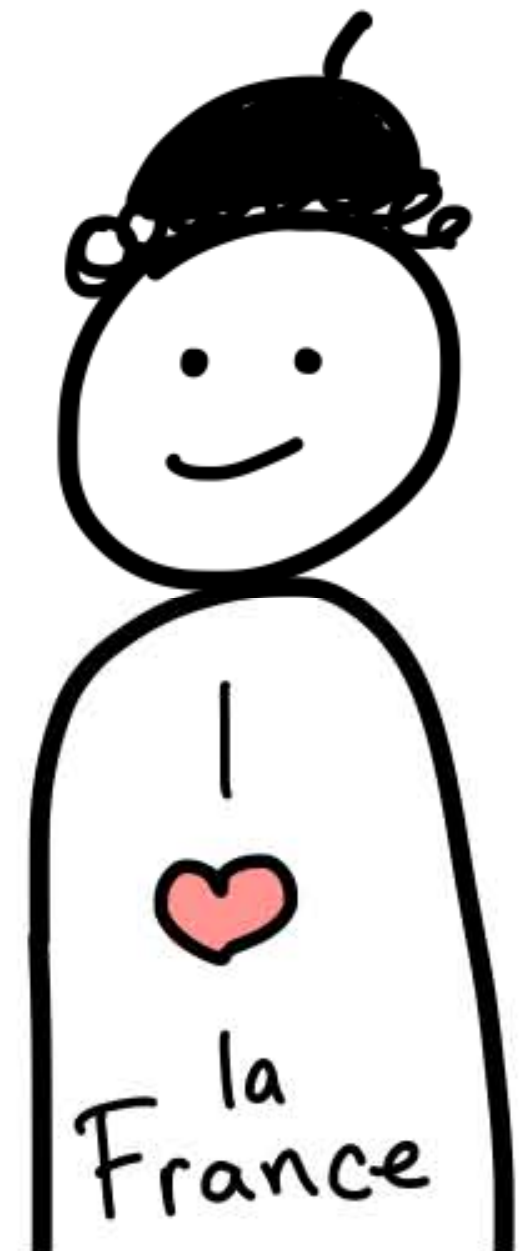
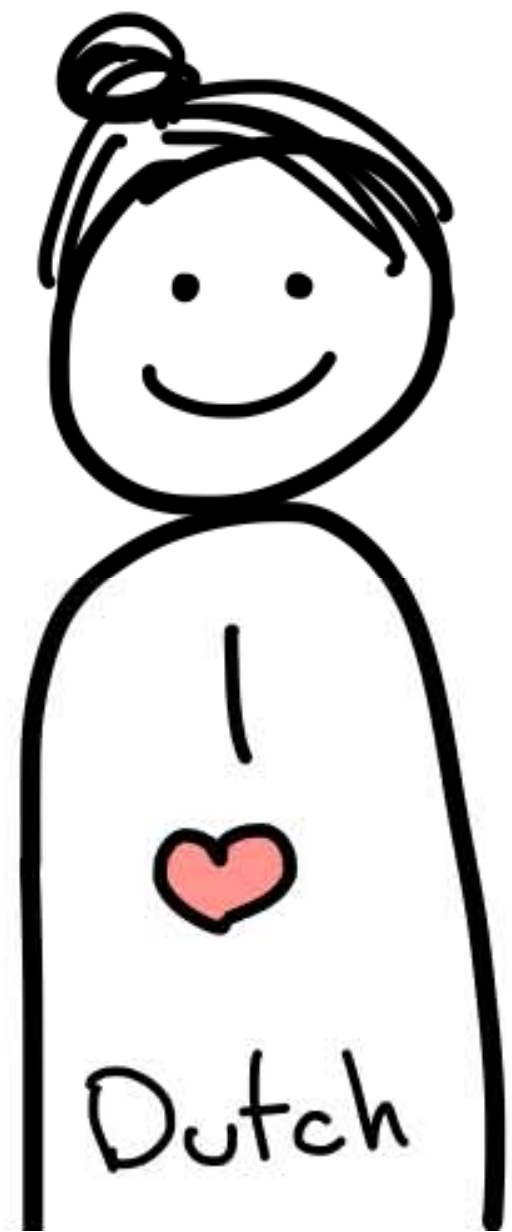
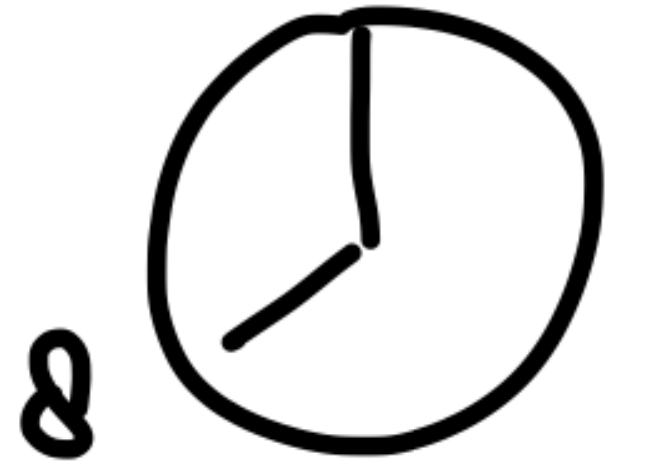
Some stuff is cultural

Want to come for
coffee at 7 pm?



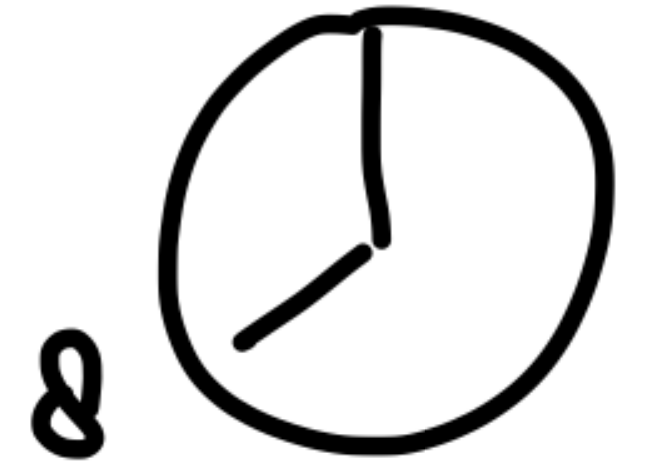
Some stuff is cultural

Want to come for
coffee at 7 pm?



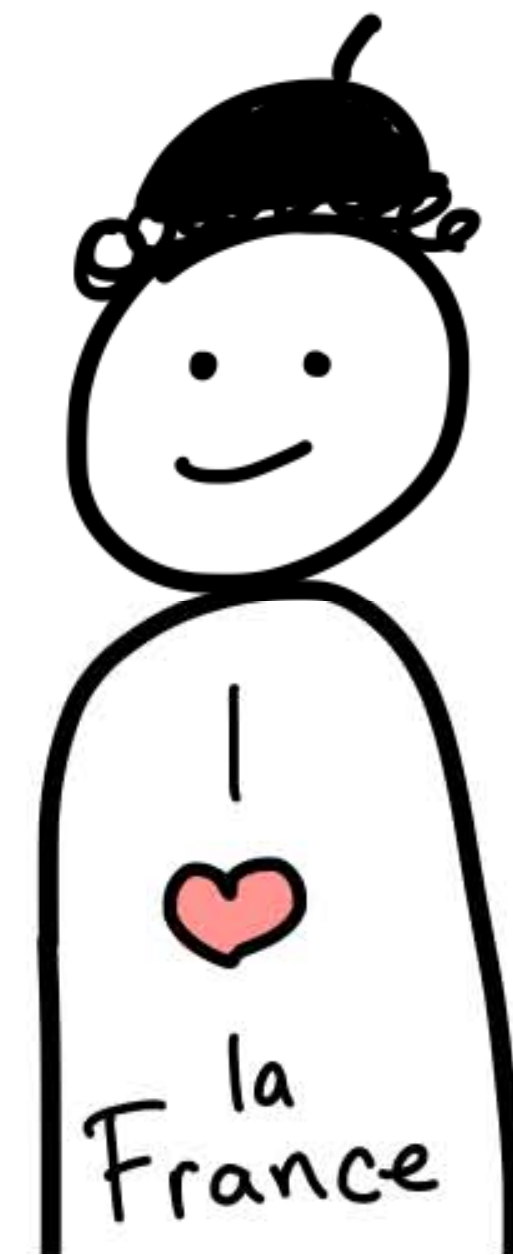
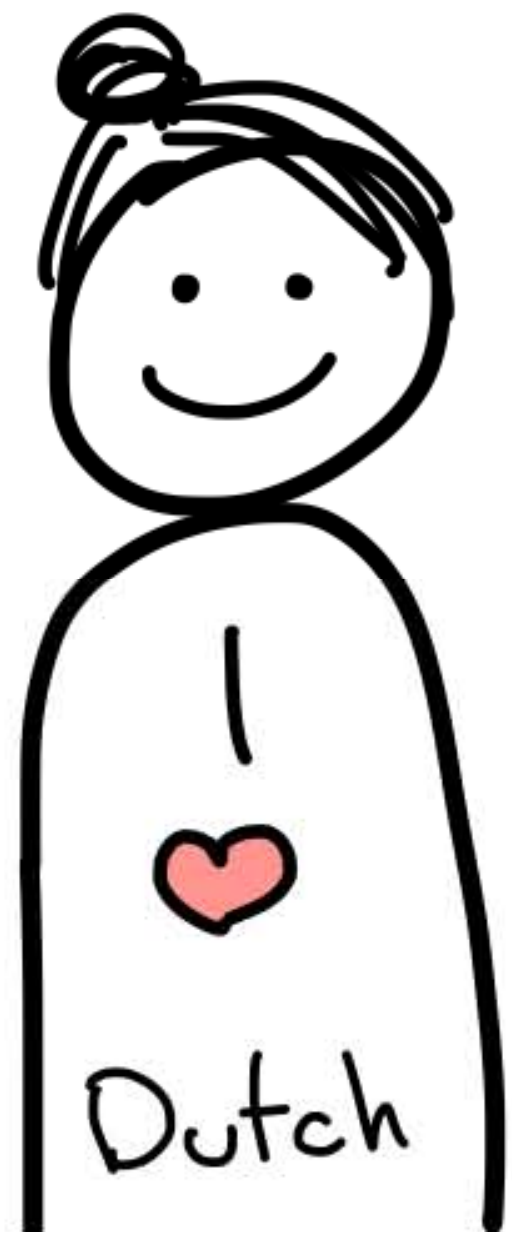
Some stuff is cultural

Want to come for
coffee at 7 pm?

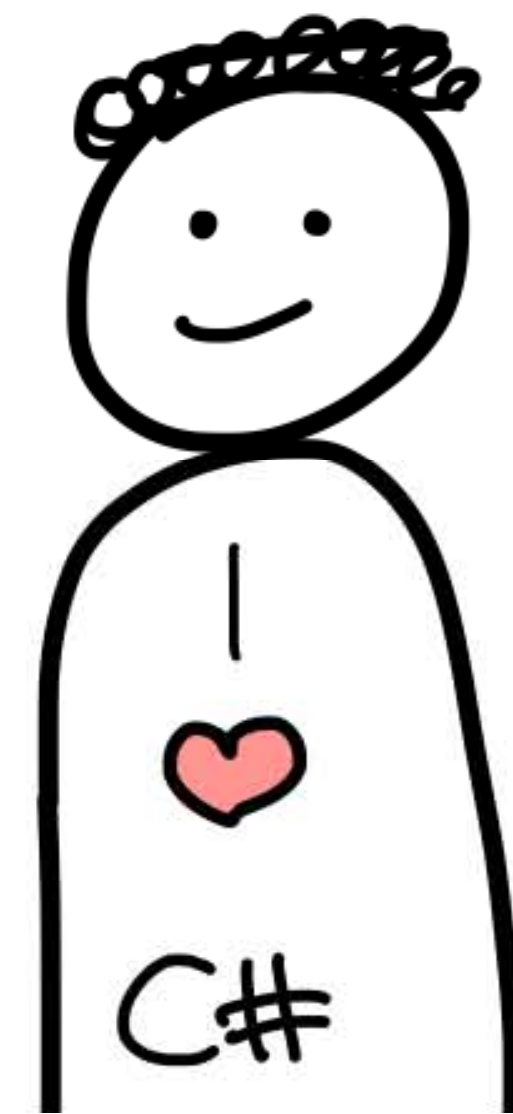
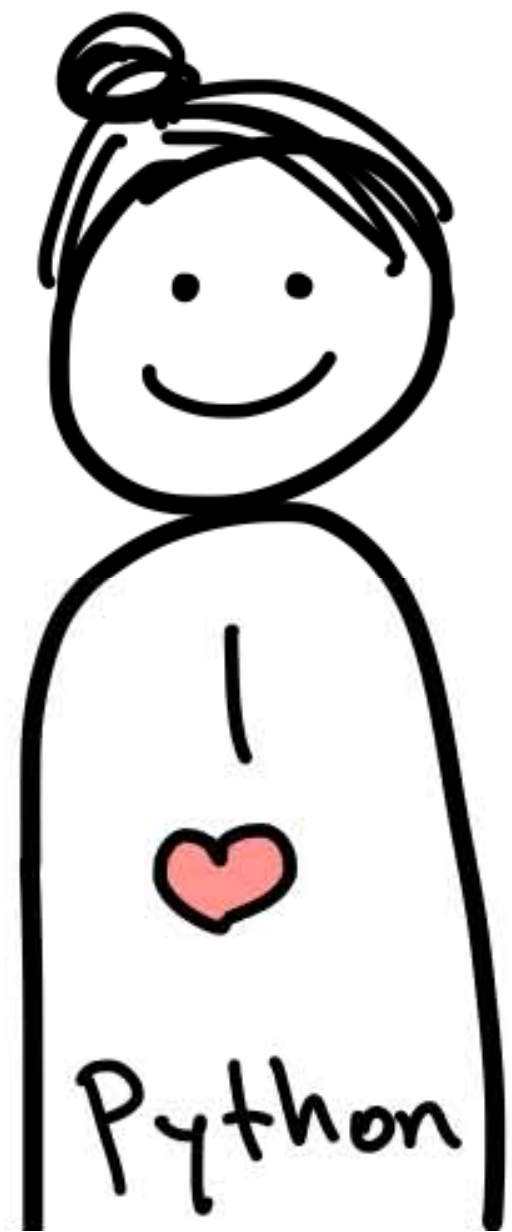


I am here —

Where is the food?

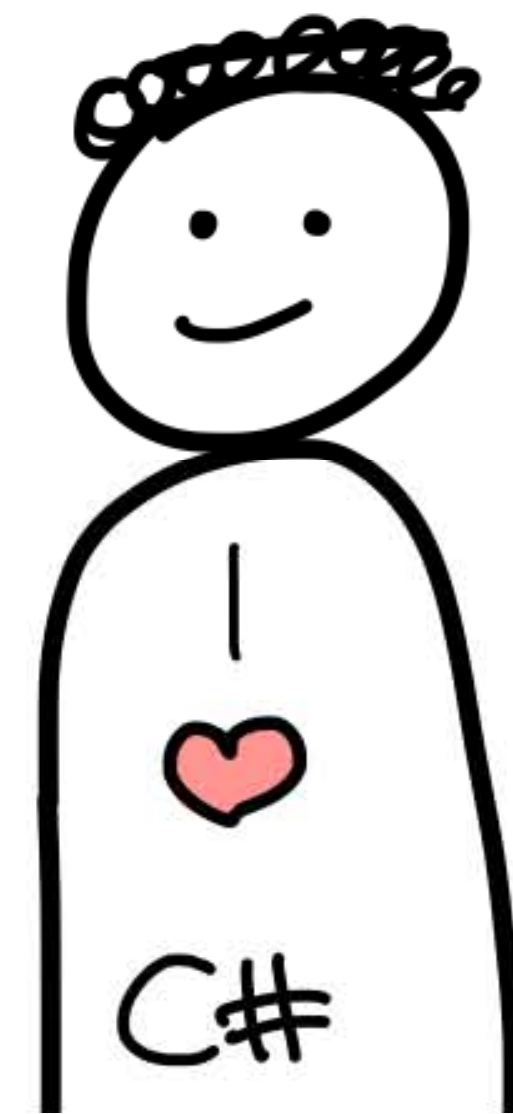


Some stuff is cultural



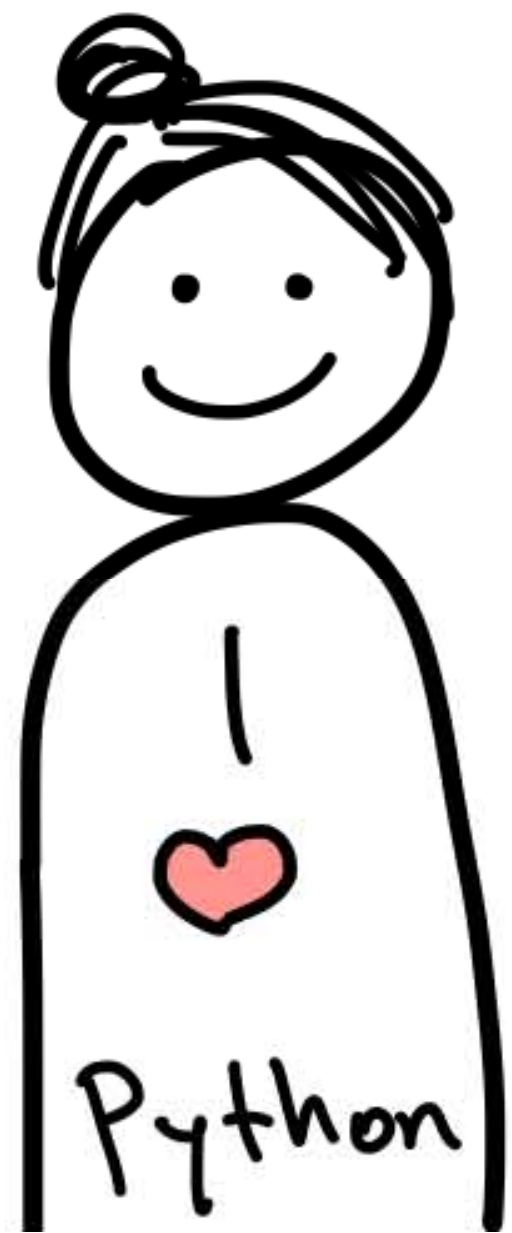
Some stuff is cultural

number_of_hearts = 12

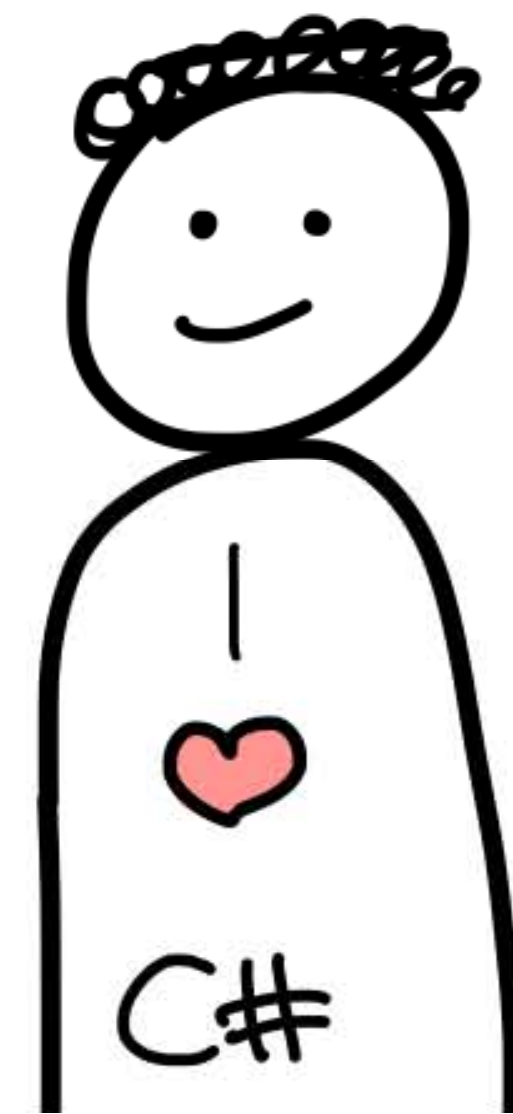


Some stuff is cultural

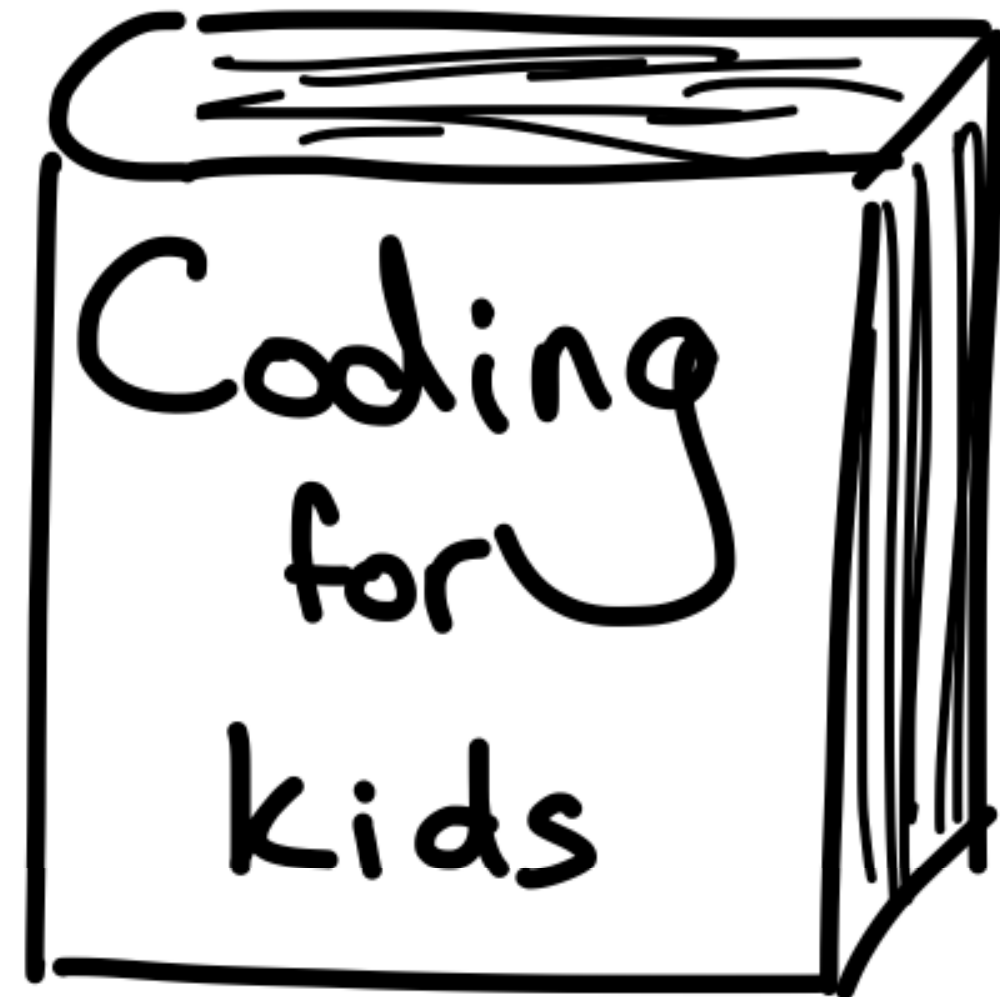
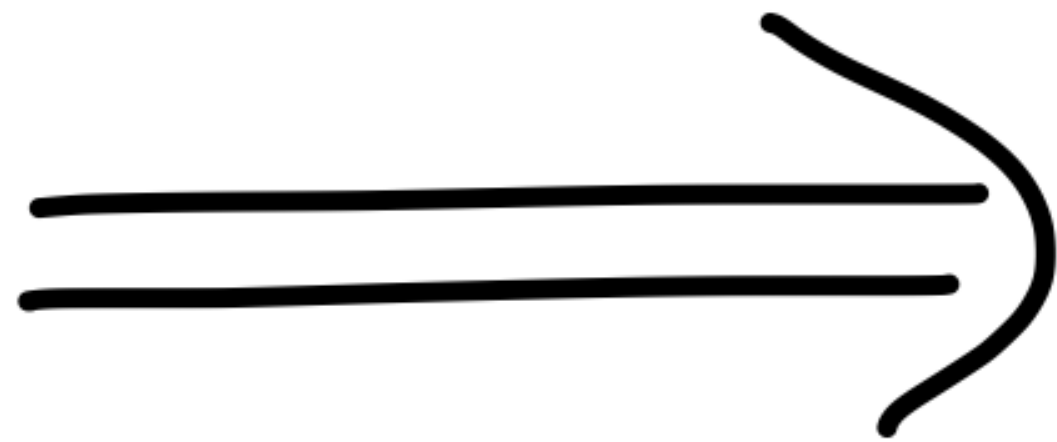
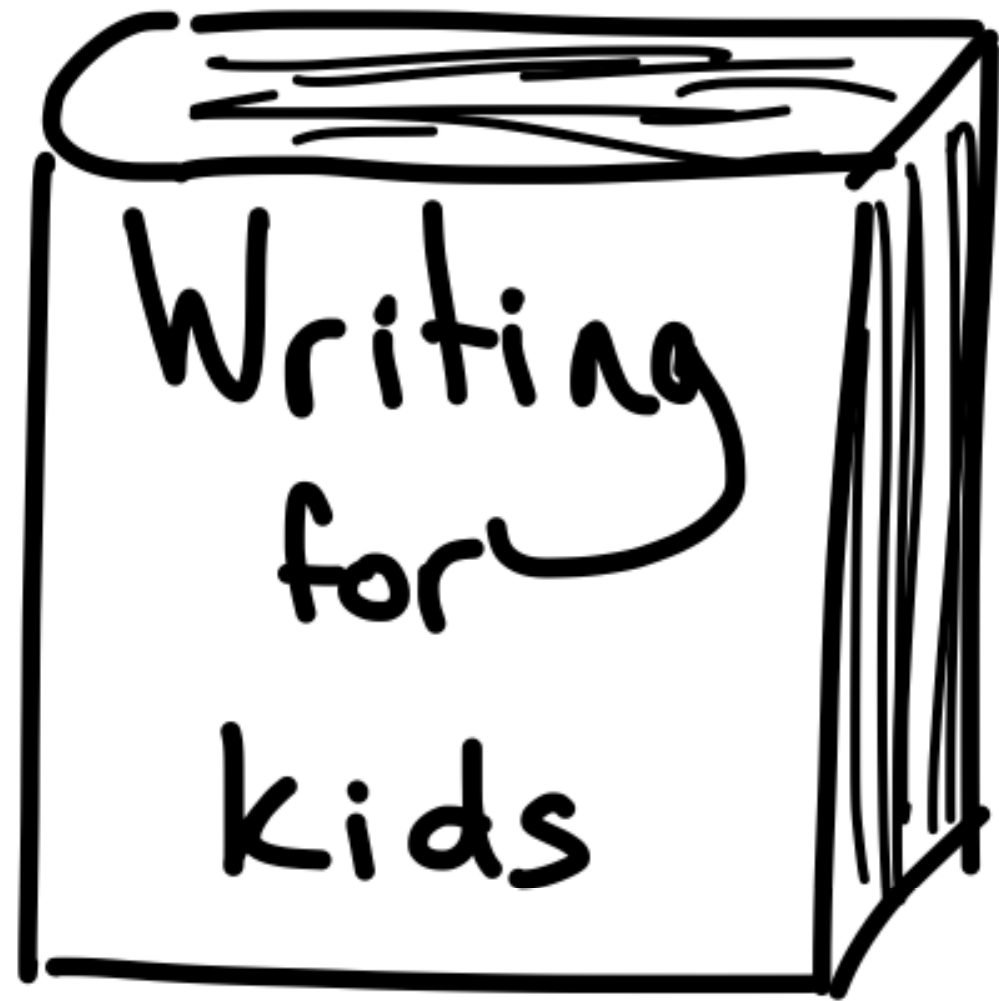
number_of_hearts = 12



nHearts = 12



Teach programming like language



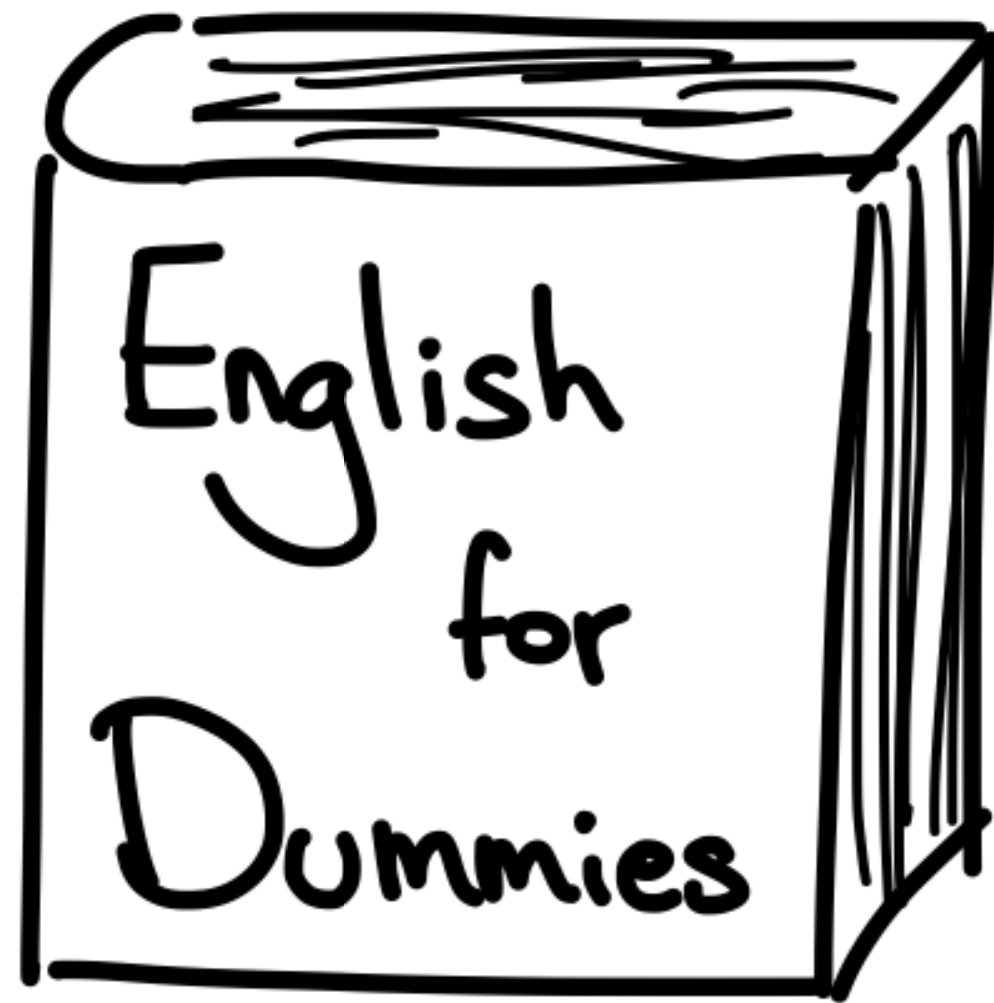
What do we know

about teaching language?

Teach programming like language

listening

reading

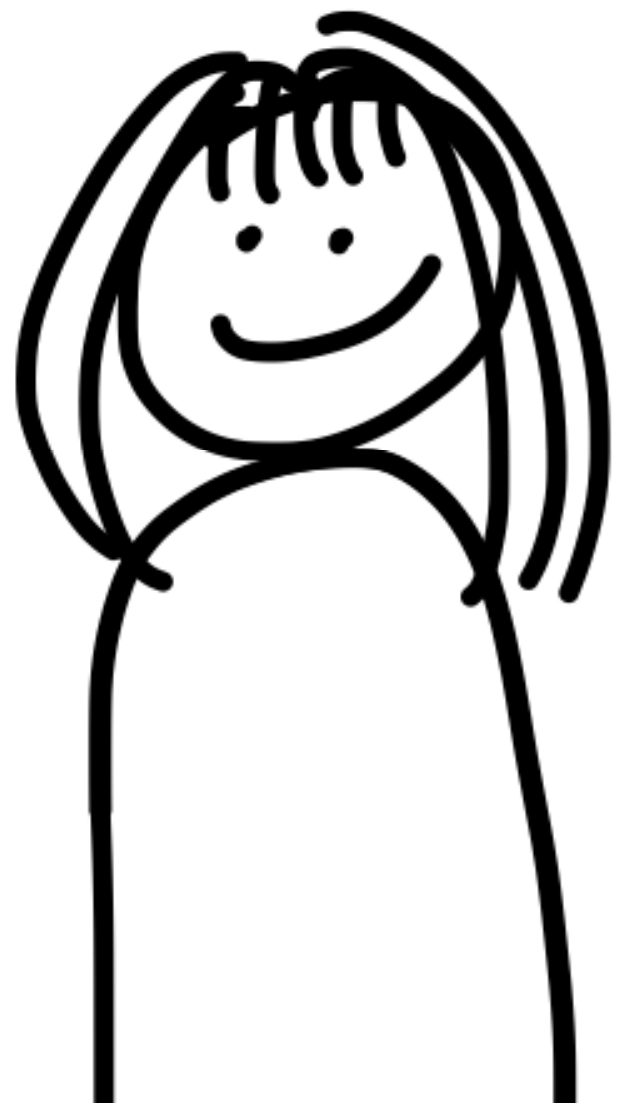


writing

speaking

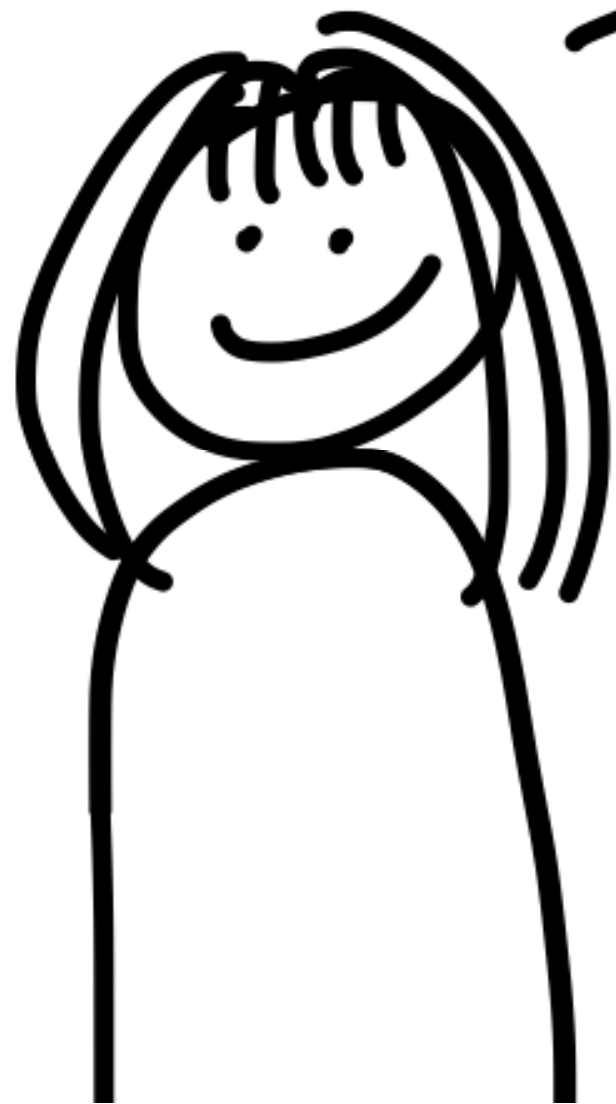
word lists

Phonics vs. Whole Language



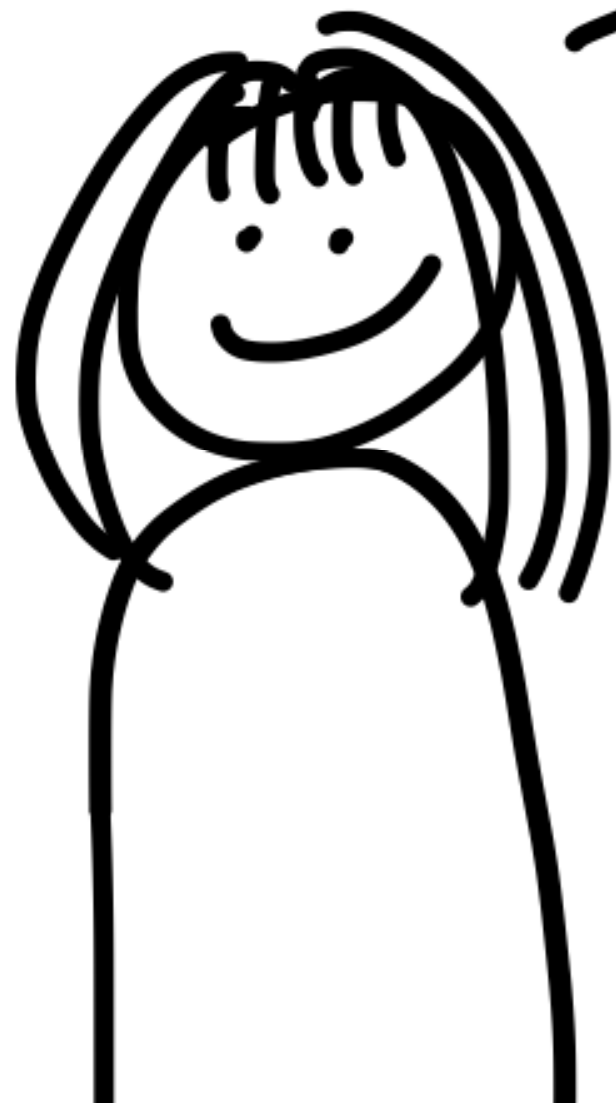
Phonics vs. Whole Language

r . e a . d



Phonics vs. Whole Language

I read a book



Phonics vs. Whole Language

this is a loop

now go reverse a string



Phonics vs. Whole Language

• if.

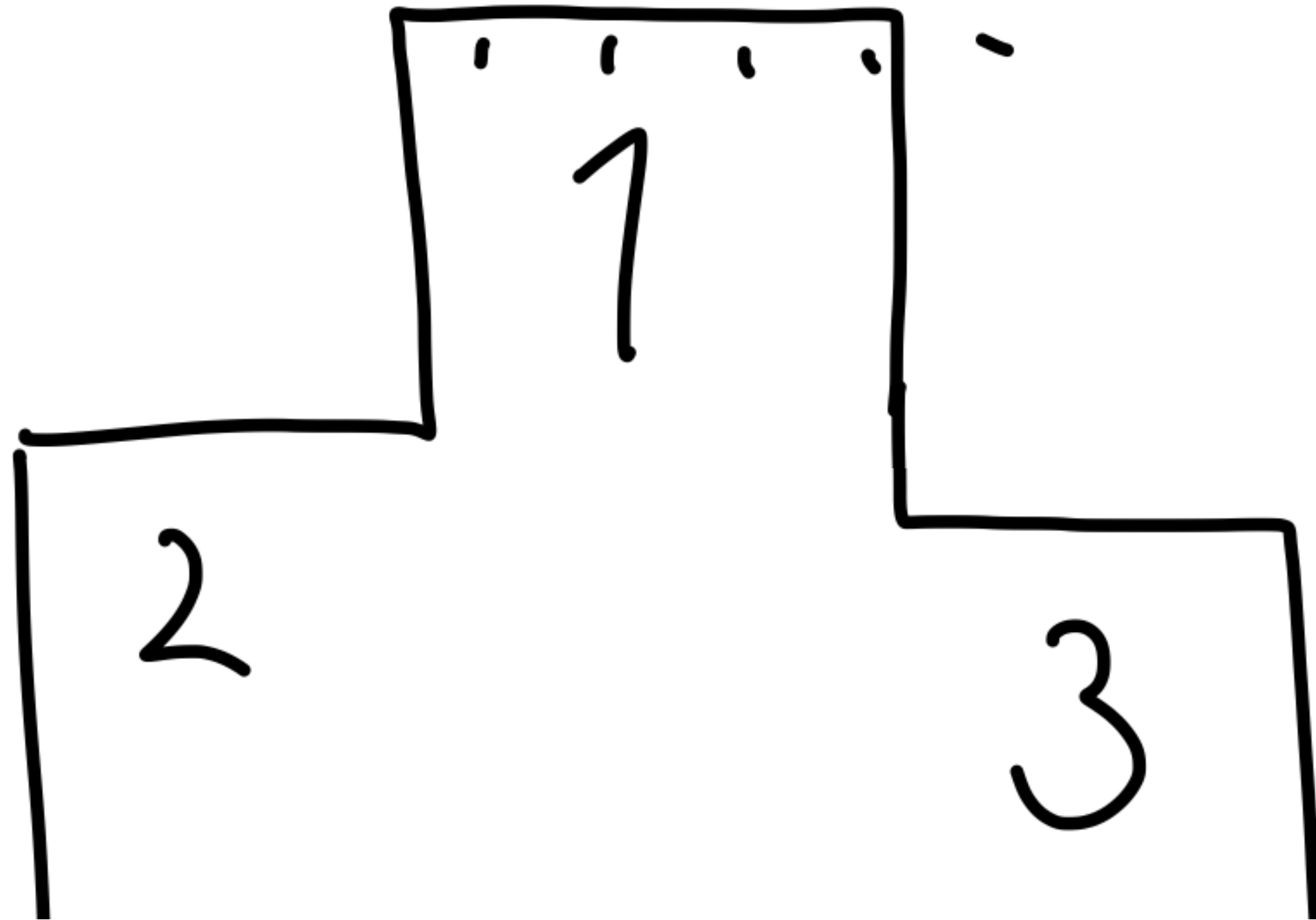
• { .

• $x = 5$.



Phonics vs. Whole Language

Phonics



Phonics vs. Whole Language

Education

Headteachers who resist teaching phonics are failing students, minister warns



8



Sommen stampen terug van weggeweest

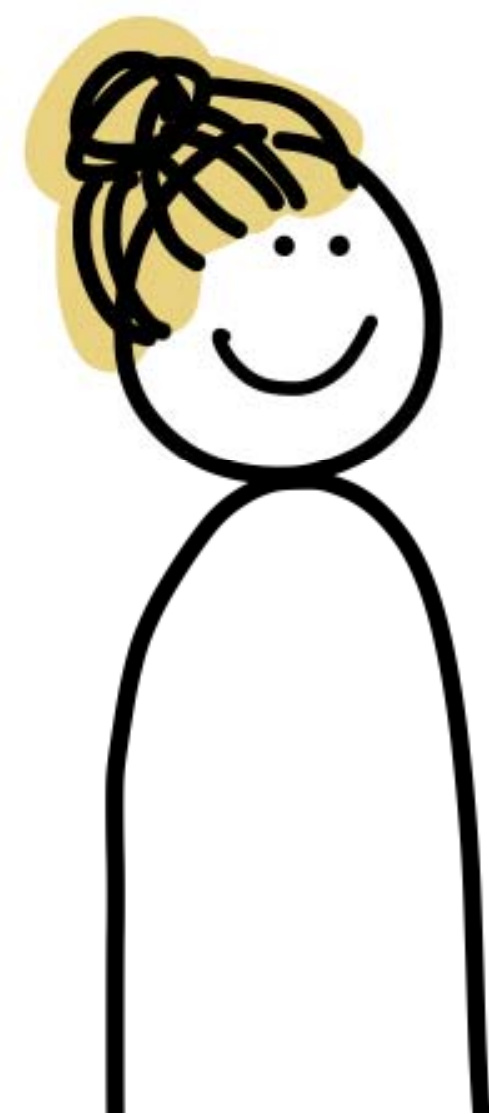
SAMENLEVING

Petra Vissers – 18:21, 3 november 2017

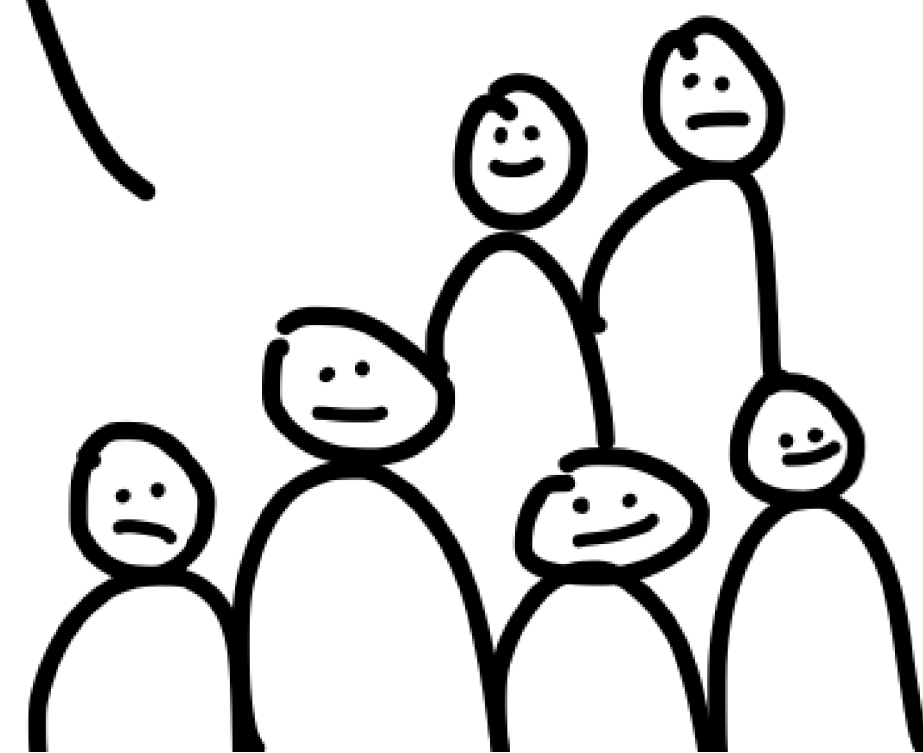


Towards a phonics approach

repeat after me: $x = 5$



"x is 5"



Towards a phonics approach

Homework

Fill in the blanks:

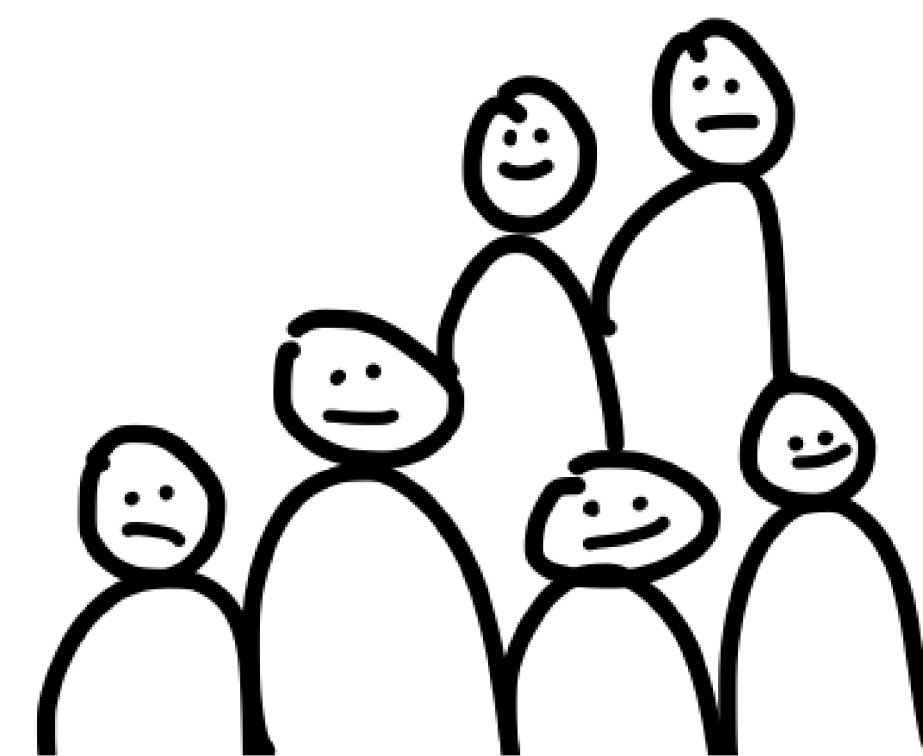
$$x = 5$$

$$x _ 5$$

$$x = _$$

$$_ = 12$$

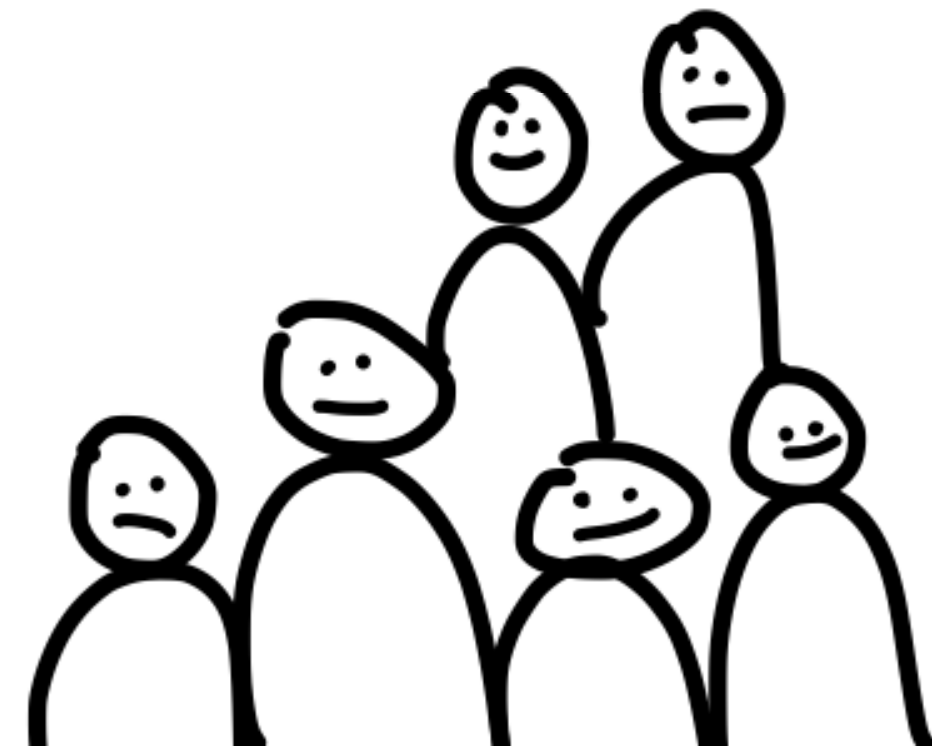
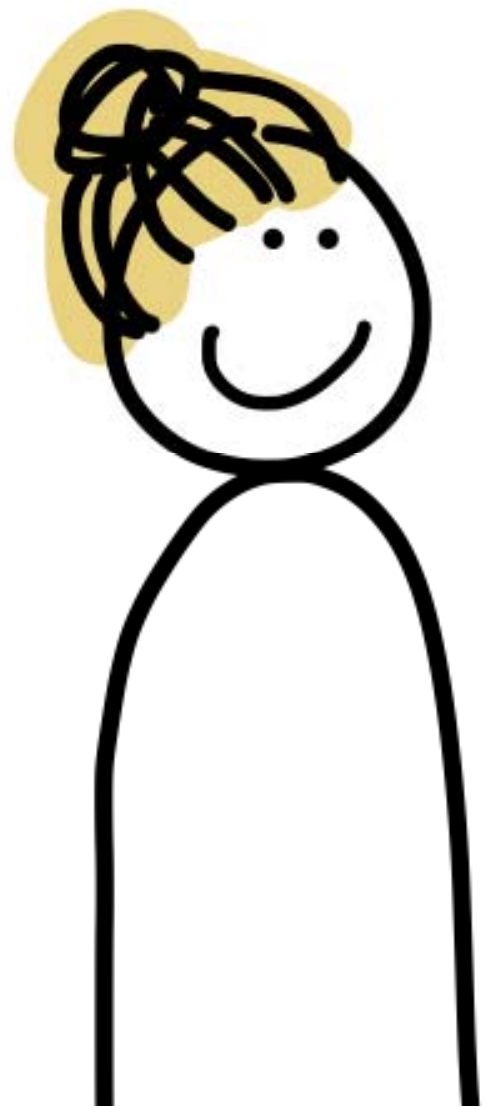
$$_ = _$$



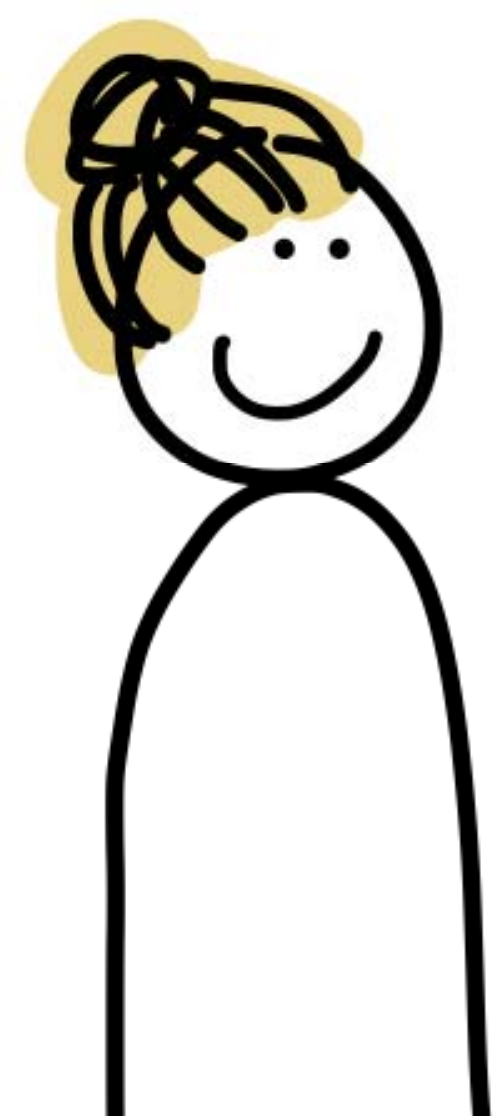
Towards a phonics approach

Now you know assignment.

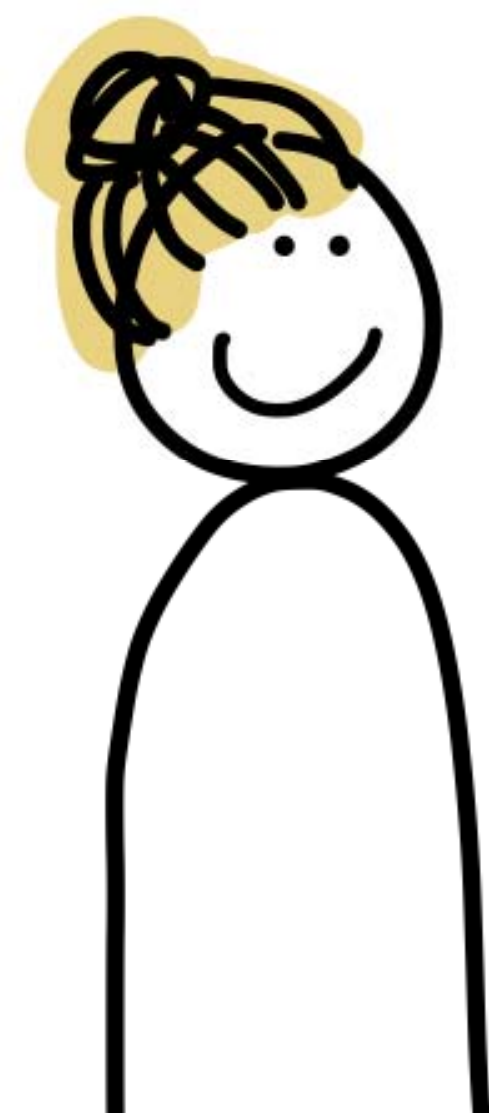
What will you build?



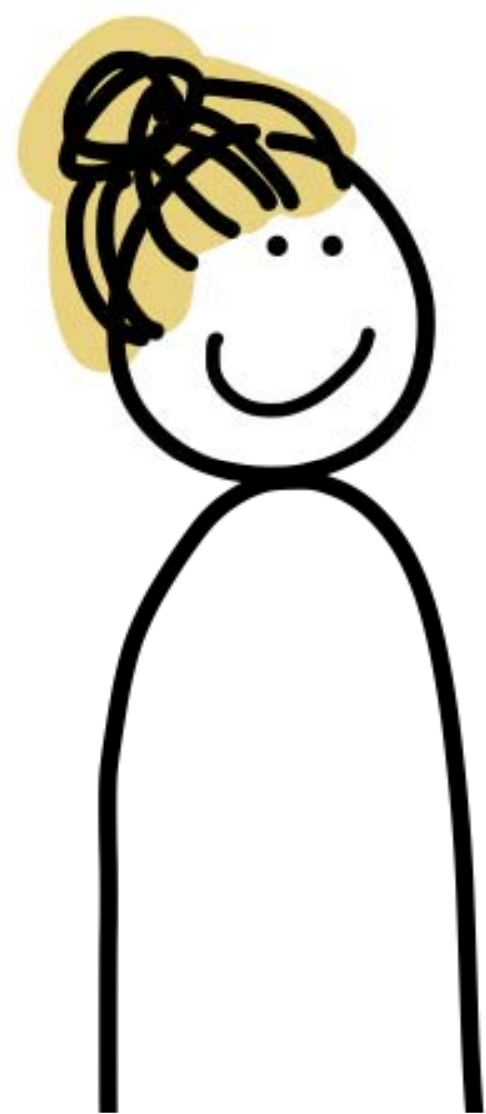
Towards a phonics approach



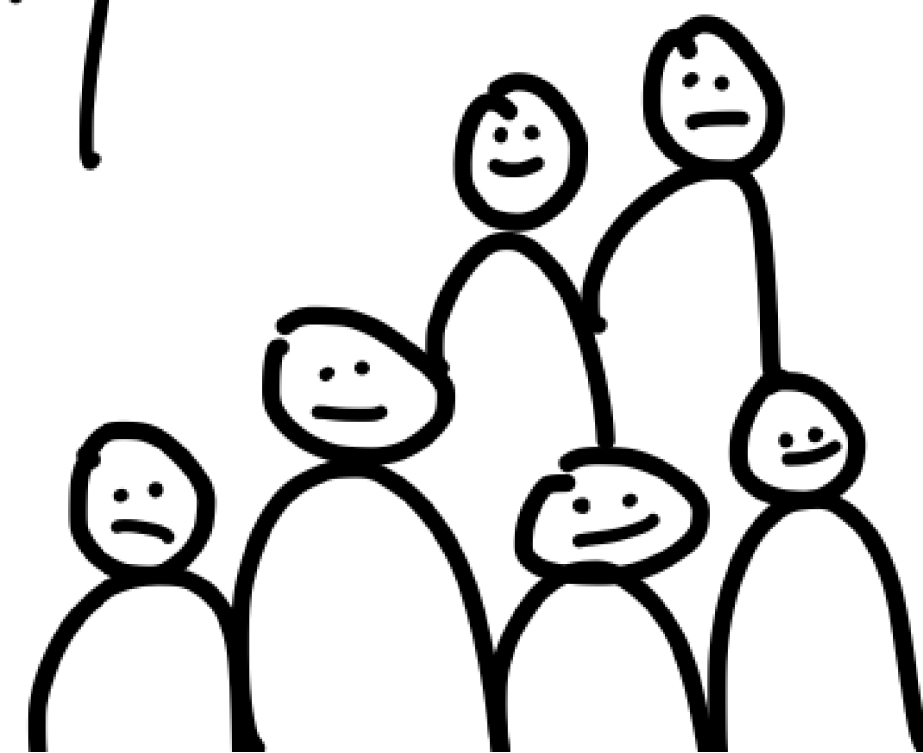
Towards a phonics approach



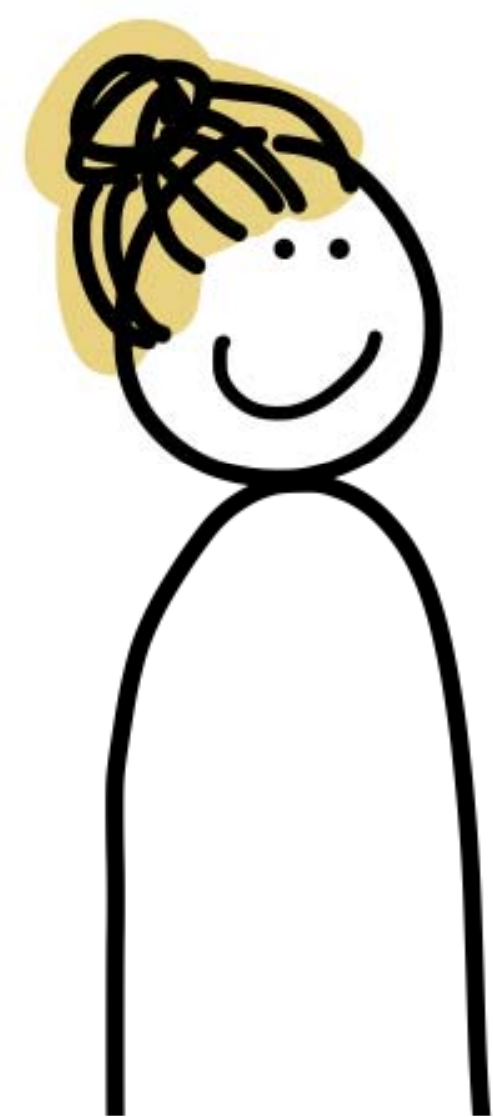
Towards a phonics approach



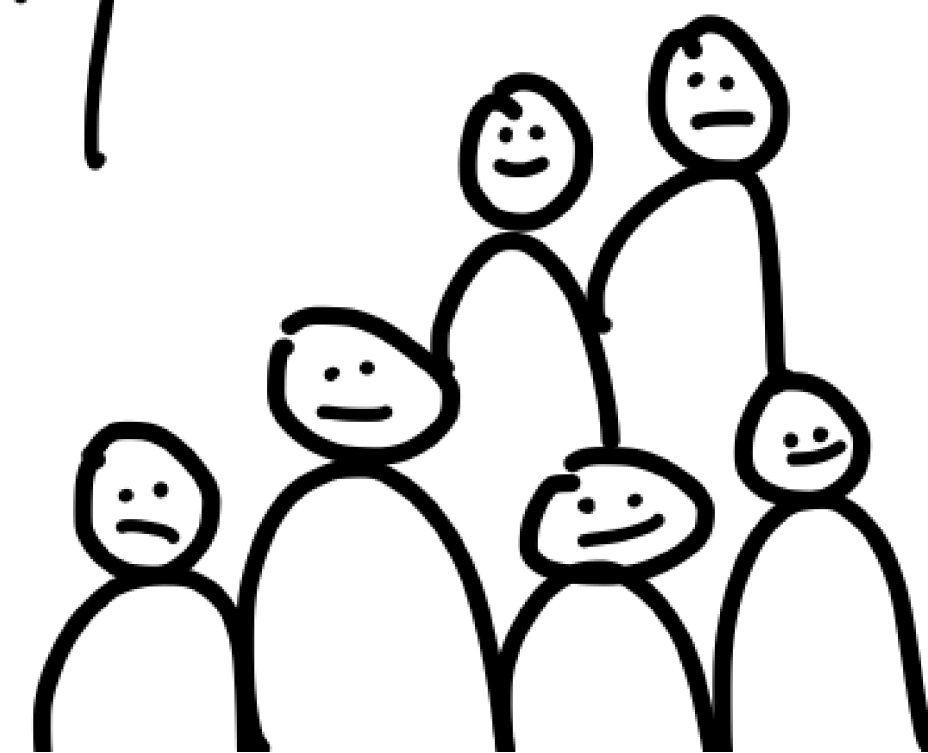
Narwhal story



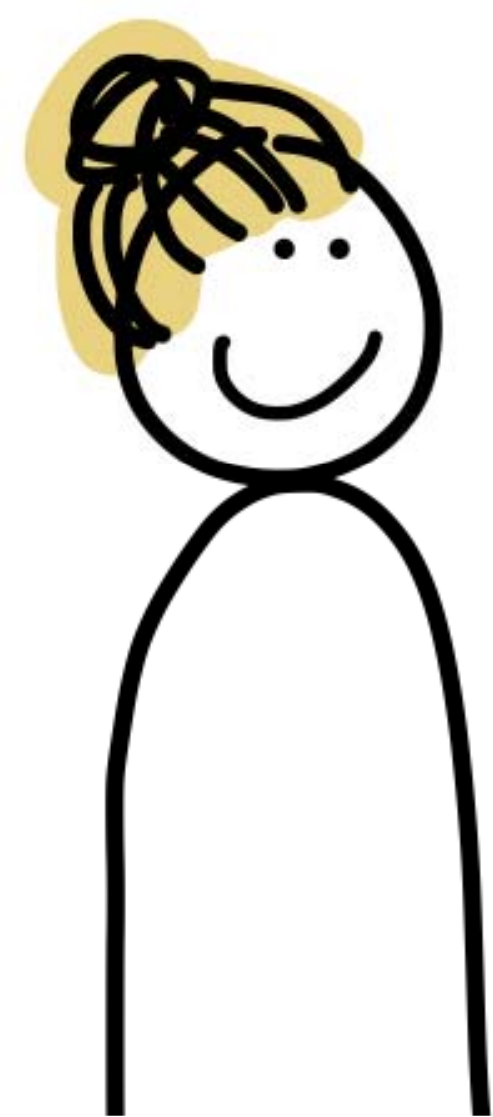
Towards a phonics approach



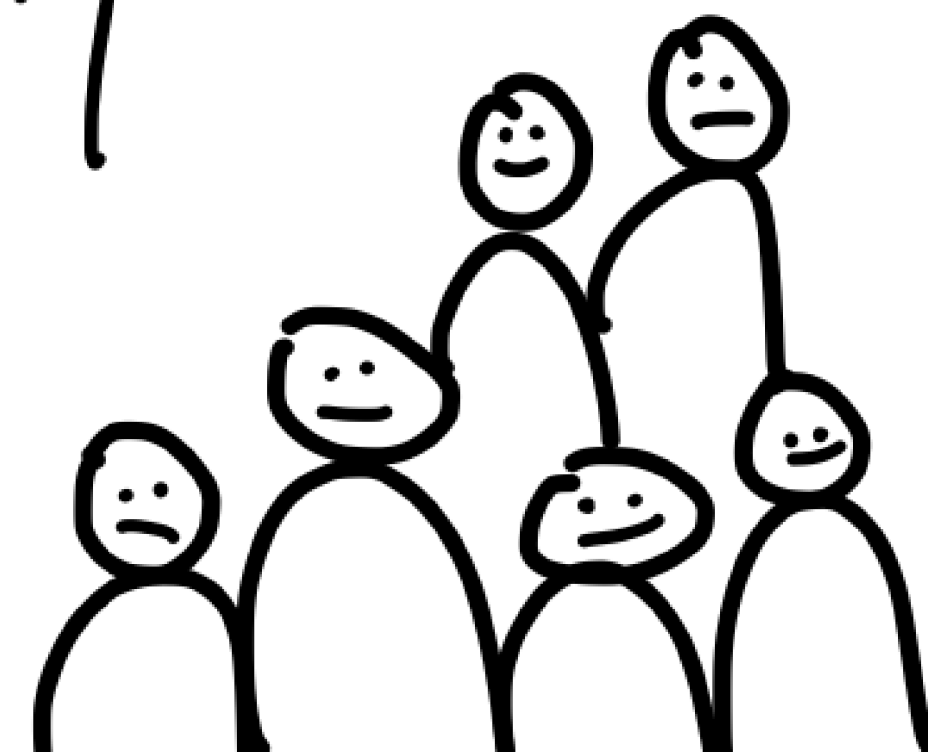
Narwhal story



Towards a phonics approach

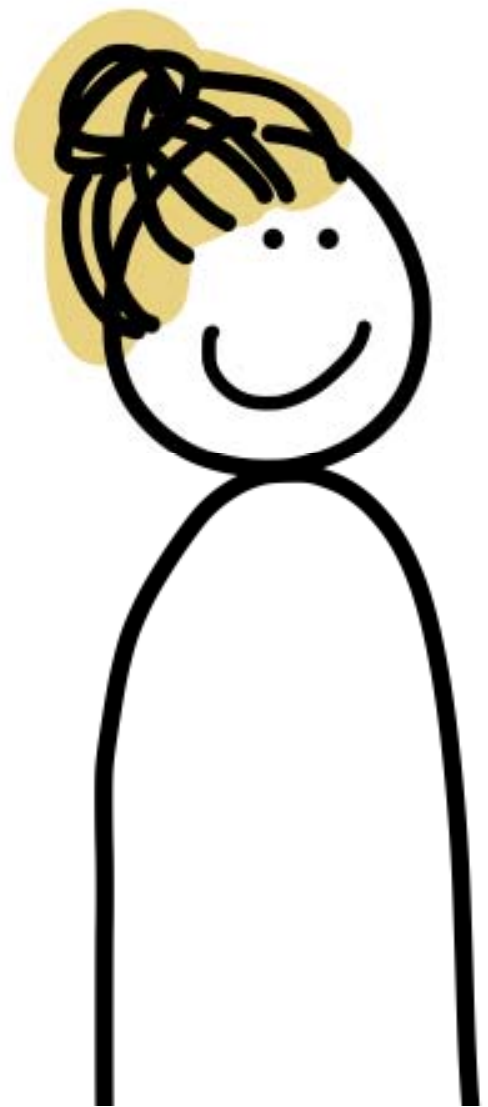
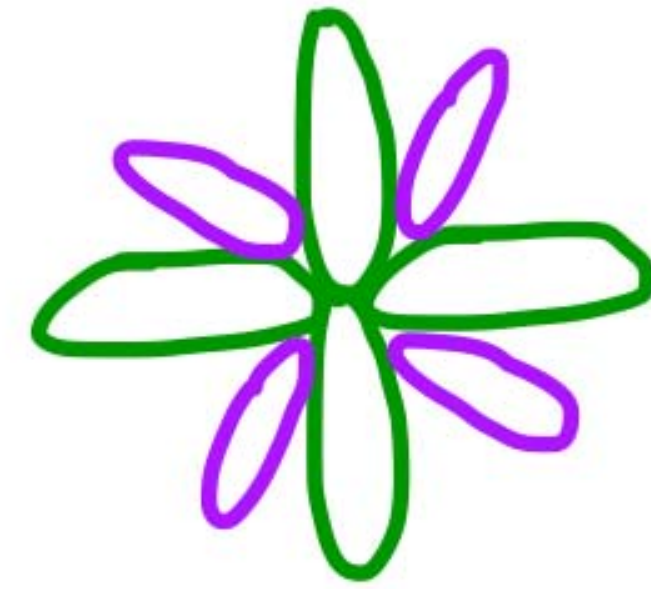


Narwhal story



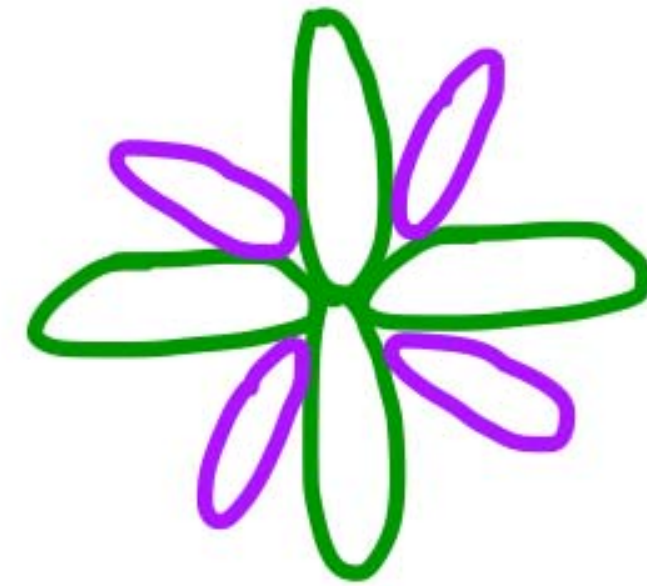
More diverse lessons

Spirograph



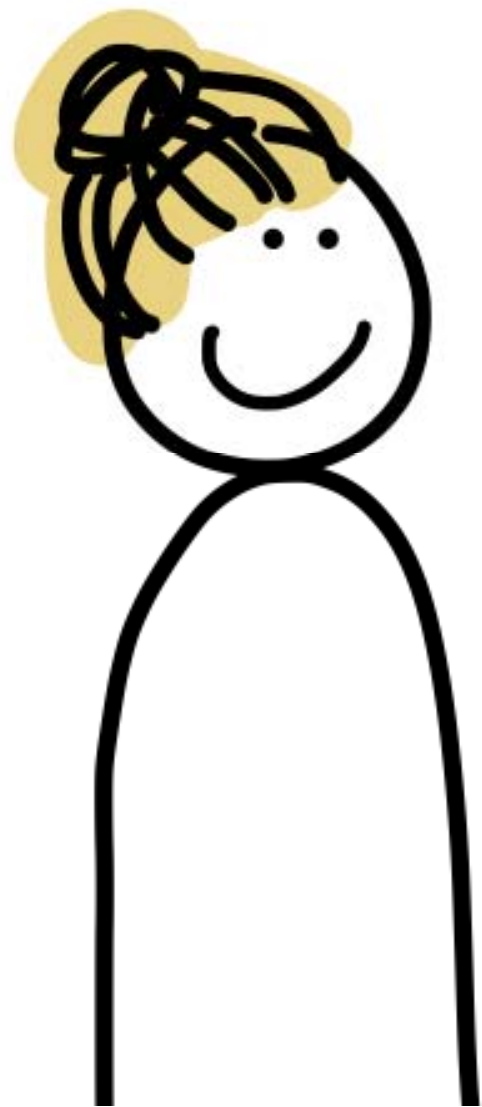
More diverse lessons

Spirograph



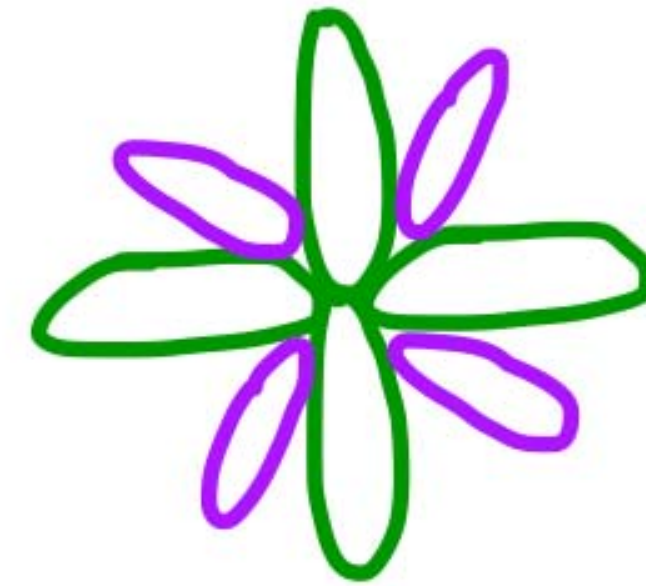
Poems

There once
was a
variable
called x ...



More diverse lessons

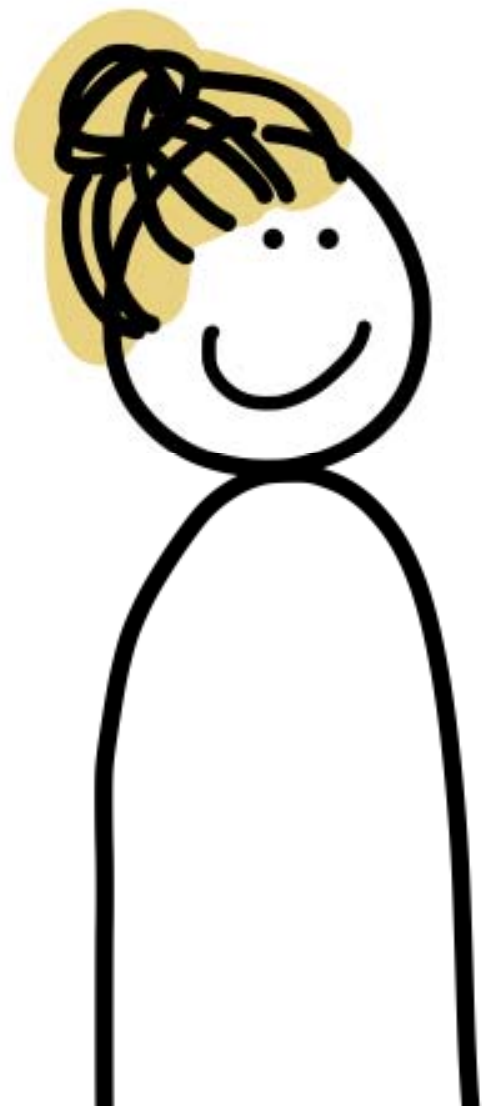
Spirograph



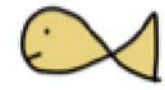
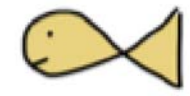
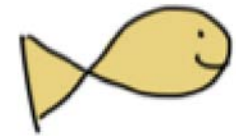
Poems

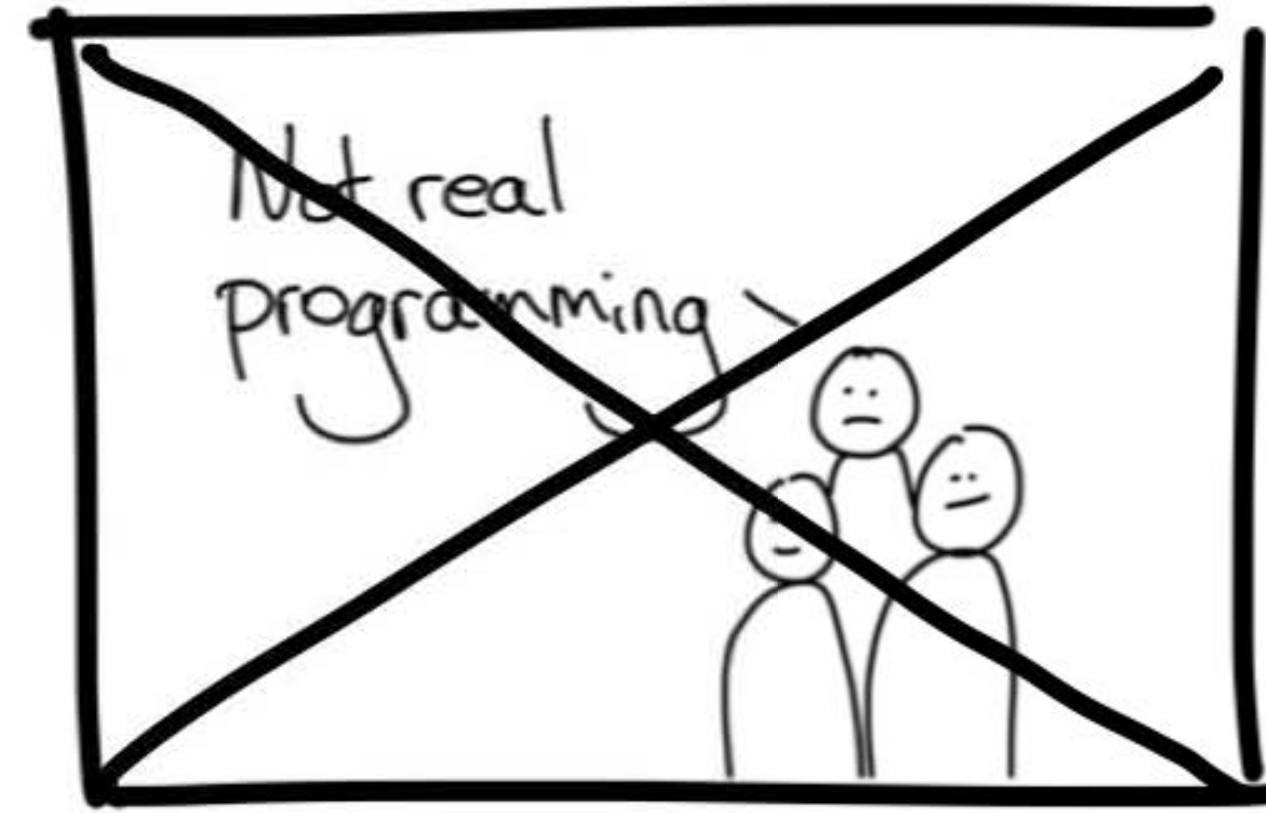
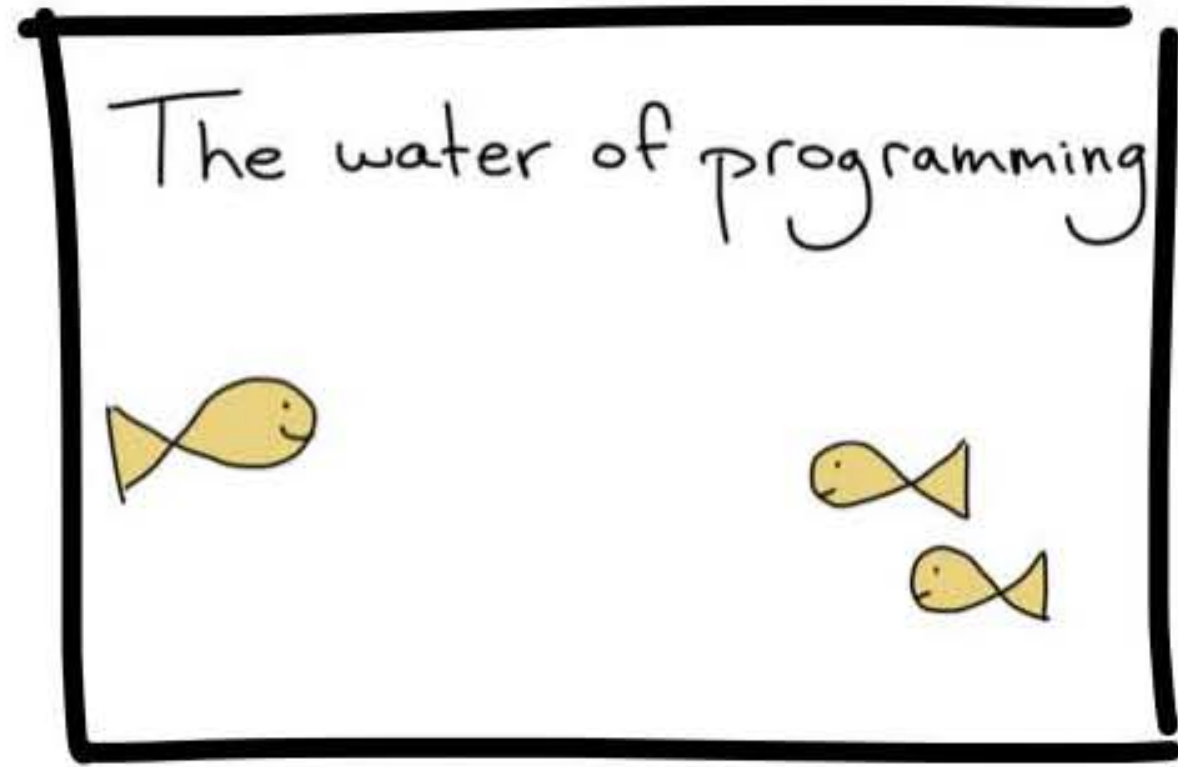
There once
was a
variable
called x ...

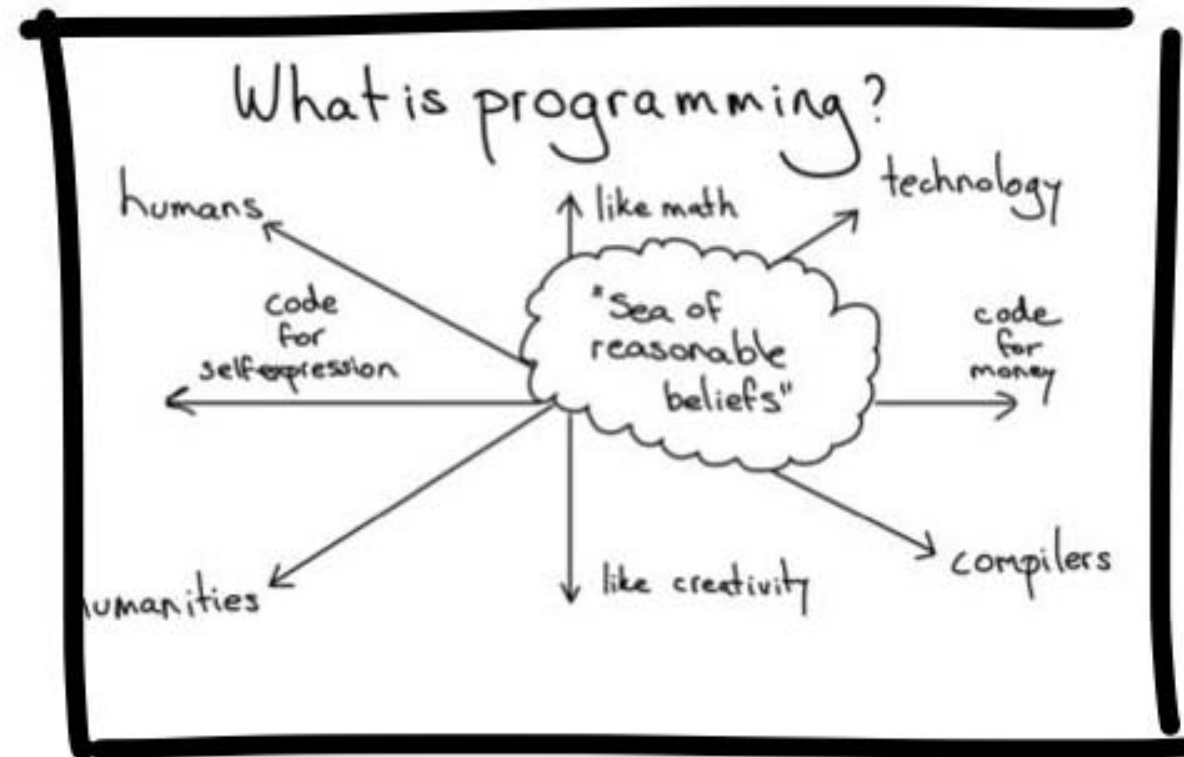
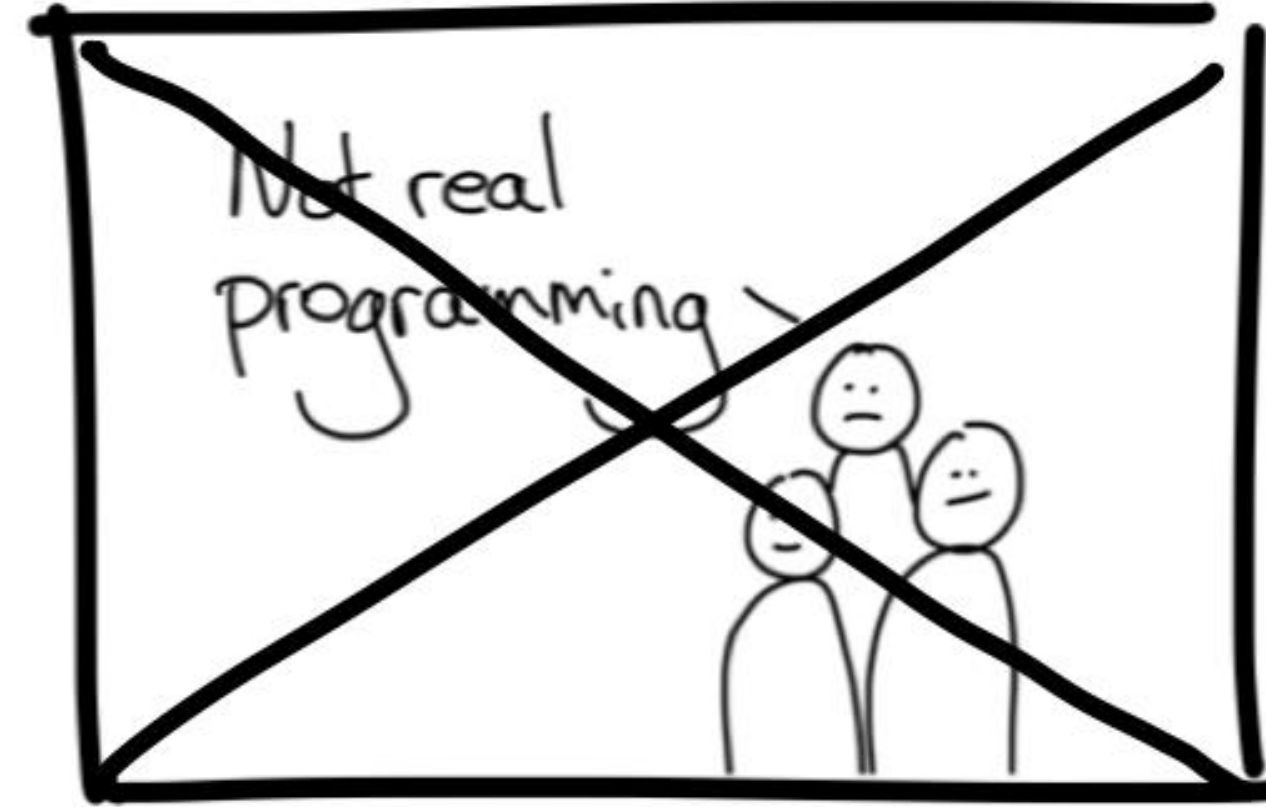
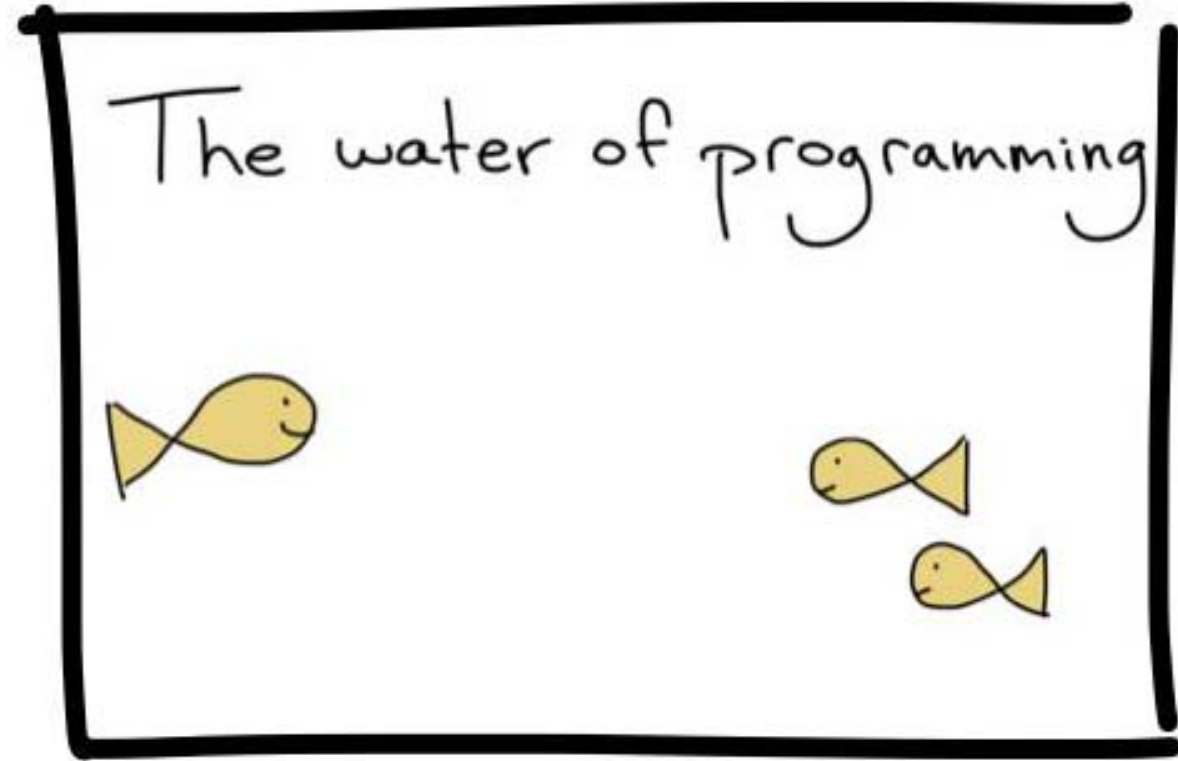
Tomorrow 11:00
in Neushoorn
Grote Danszaal

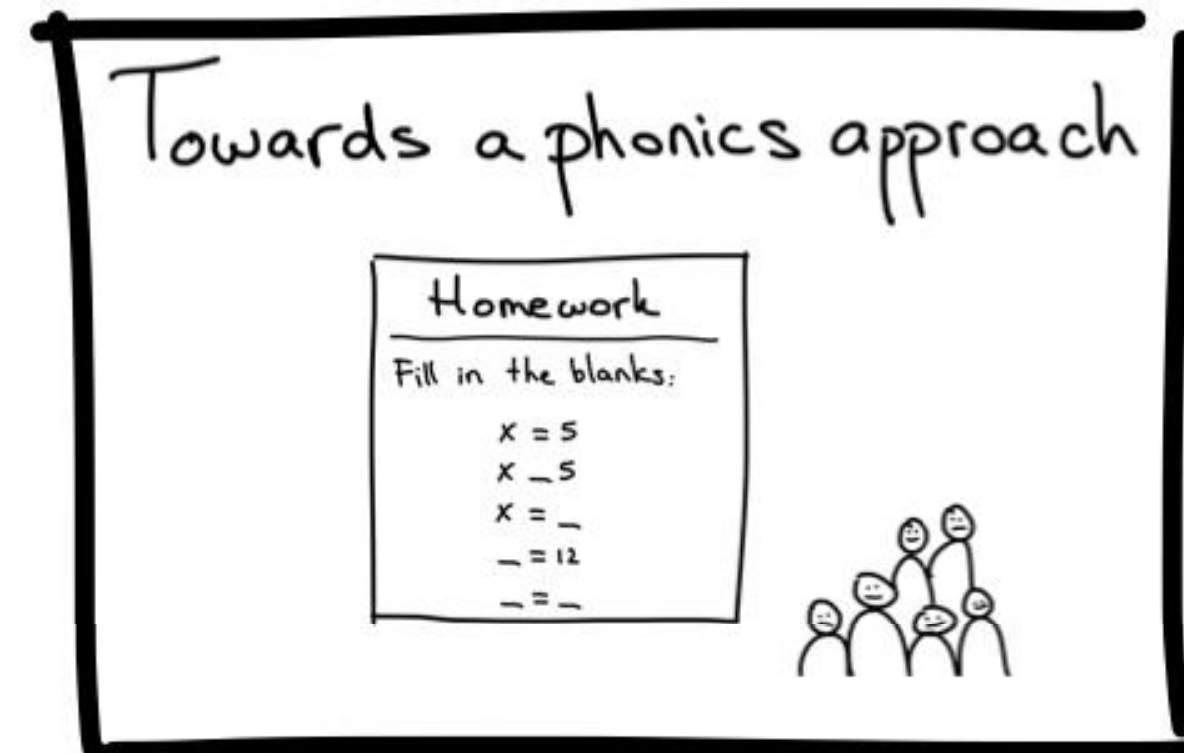
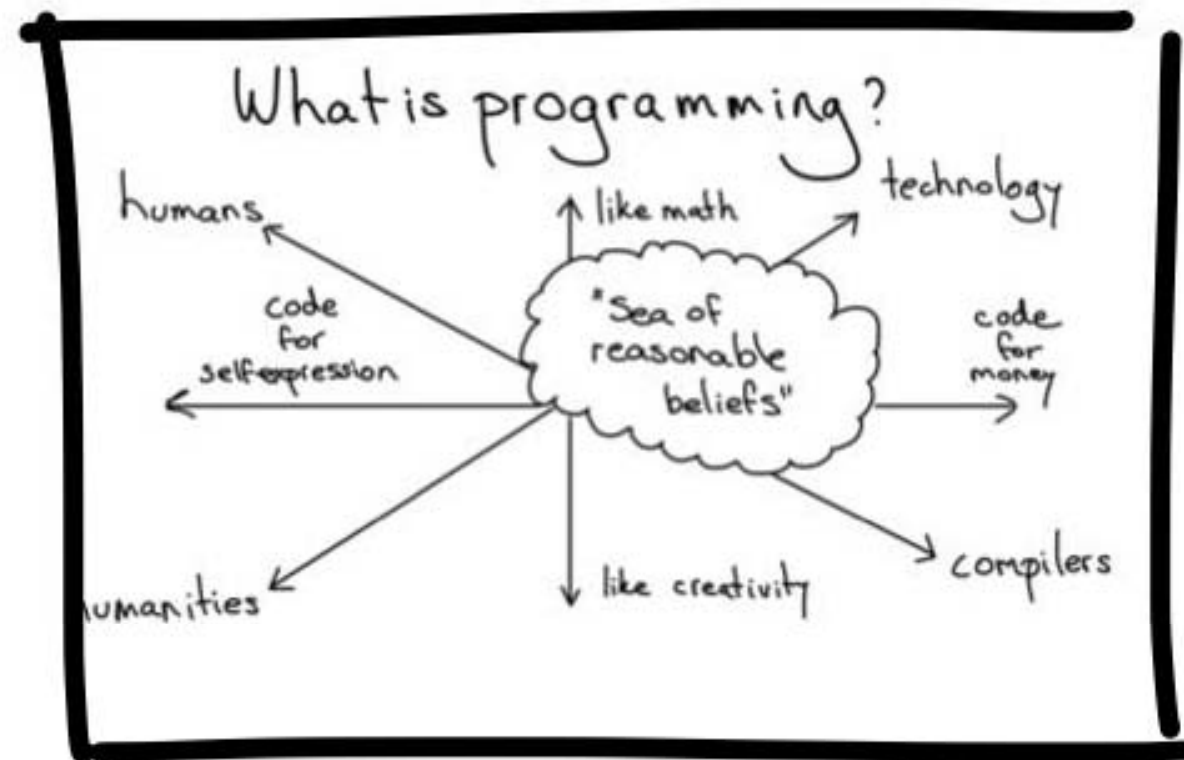
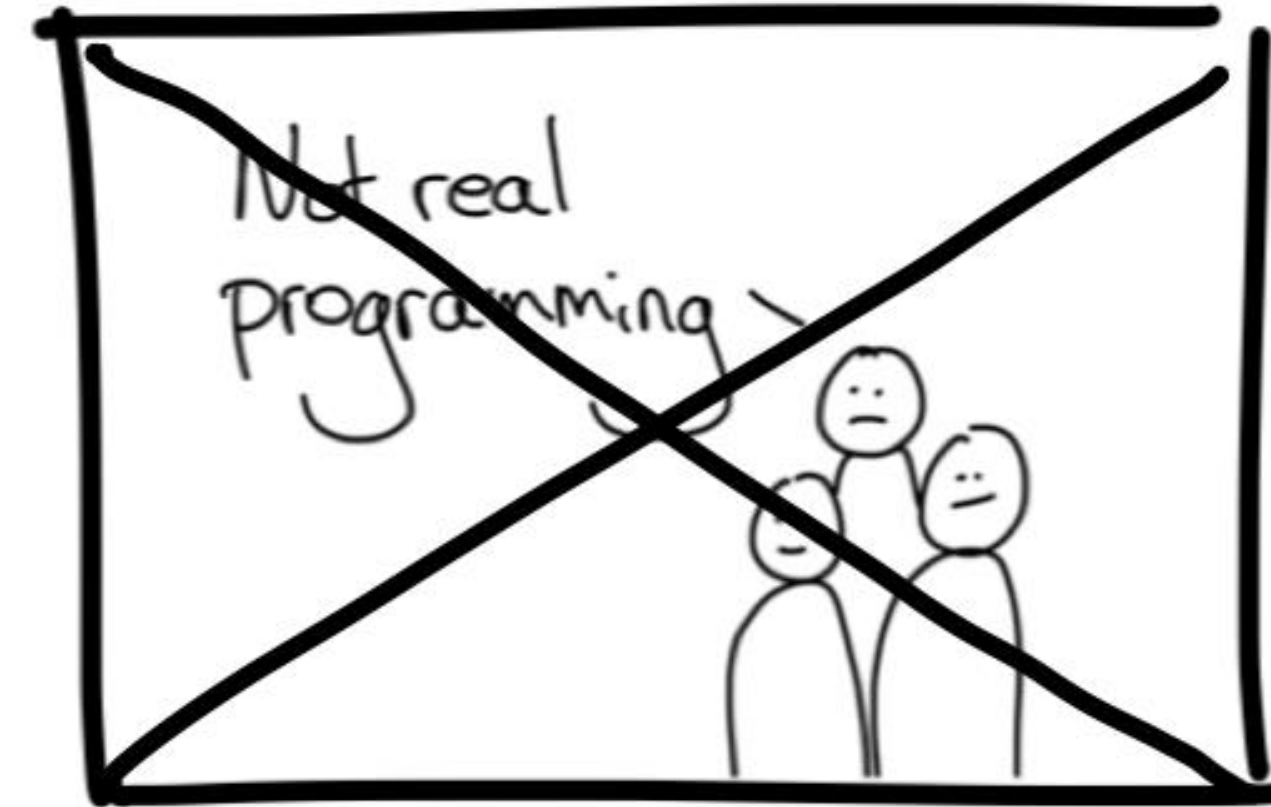
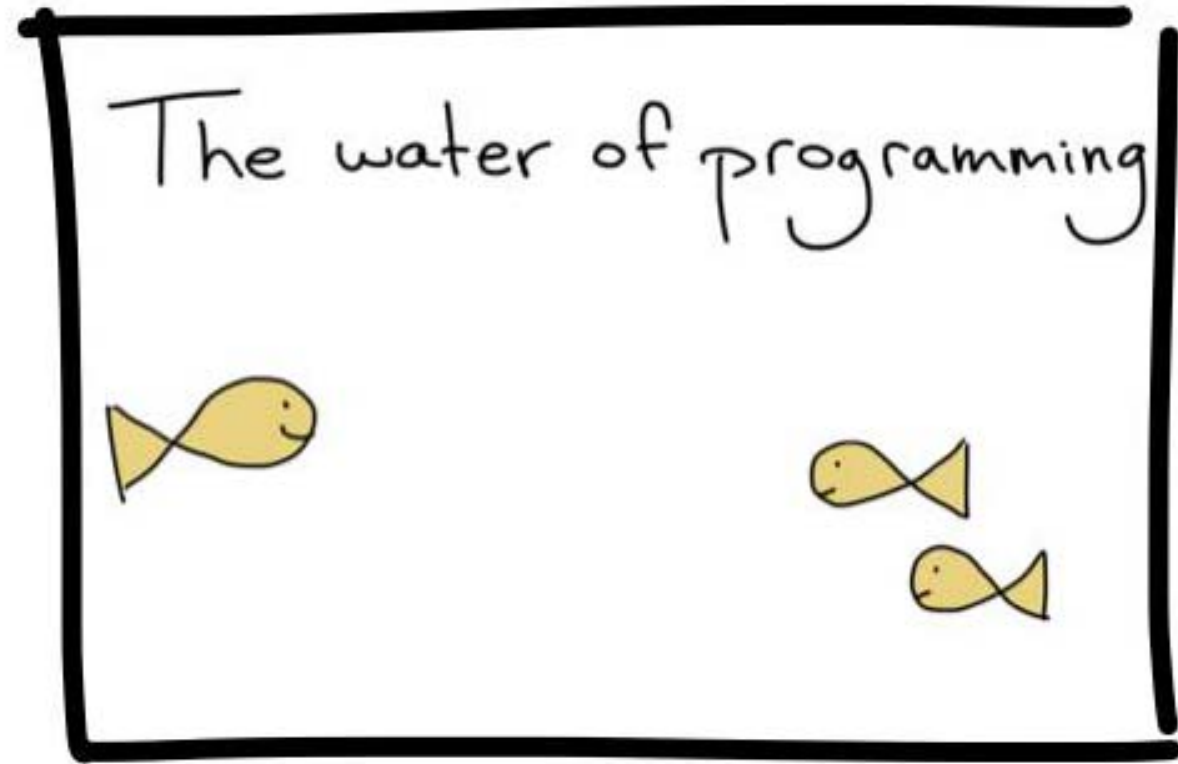


The water of programming



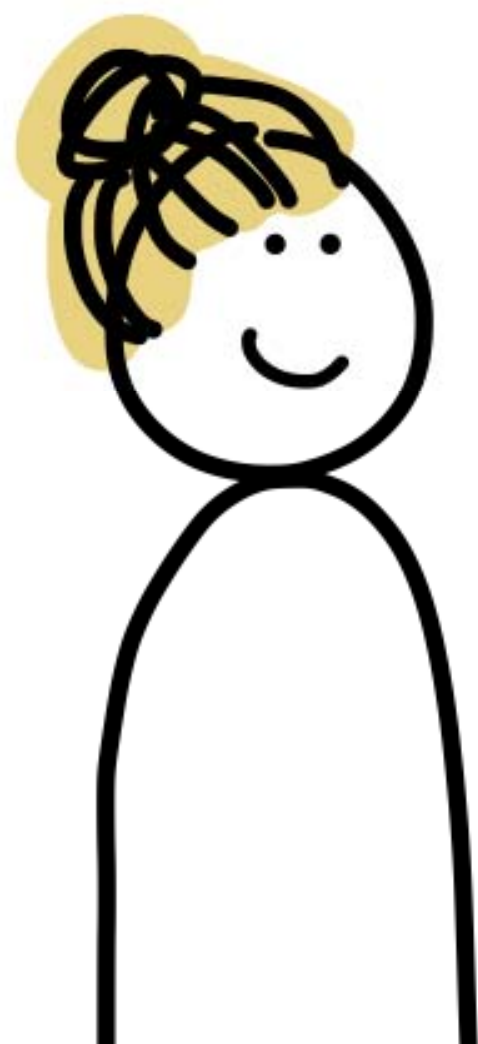






THE END

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THE END

Slides made with
Goodnotes & Pencil

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