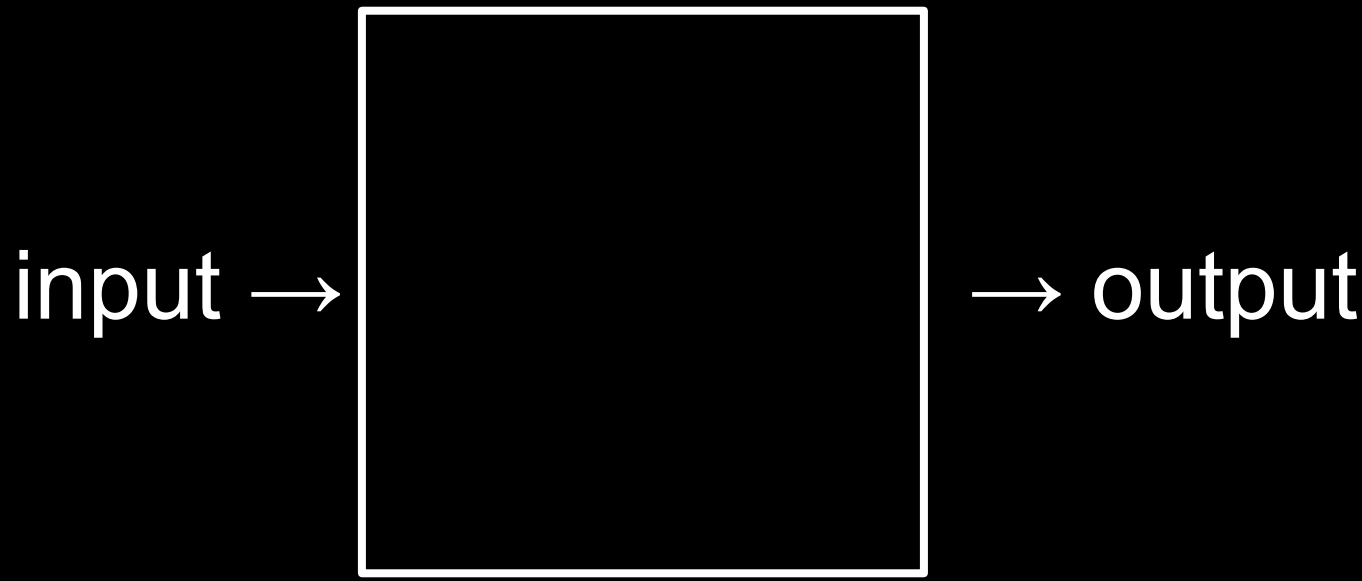
This is CS50

2/3

of CS50 students have never taken CS before

what ultimately matters in this course is not so much where you end up relative to your classmates but where you end up relative to yourself when you began


input →
→ output

representation

0 1 2 3 4 5 6 7 8 9

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123

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002

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003

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100 10 1

010

100 10 1

000

10^2 10^1 10^0

000

2^2 2^1 2^0

000

4 2 1

000

4 2 1

001

4 2 1

010

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110

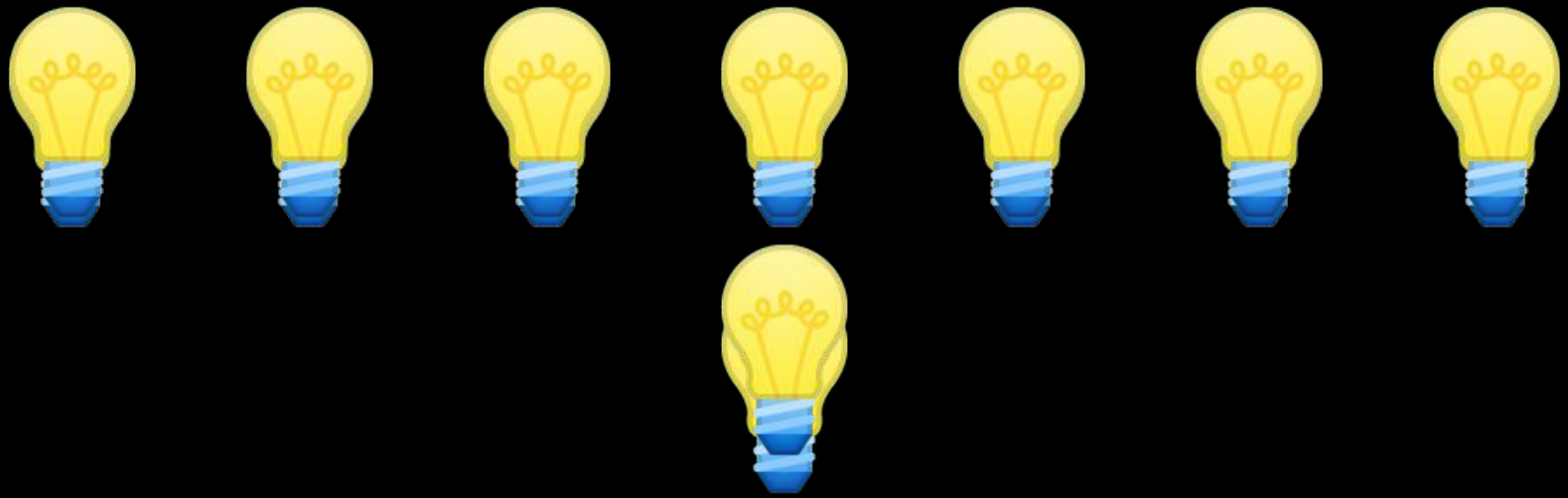
4 2 1

11

1

bit

bit bit bit bit bit bit bit bit



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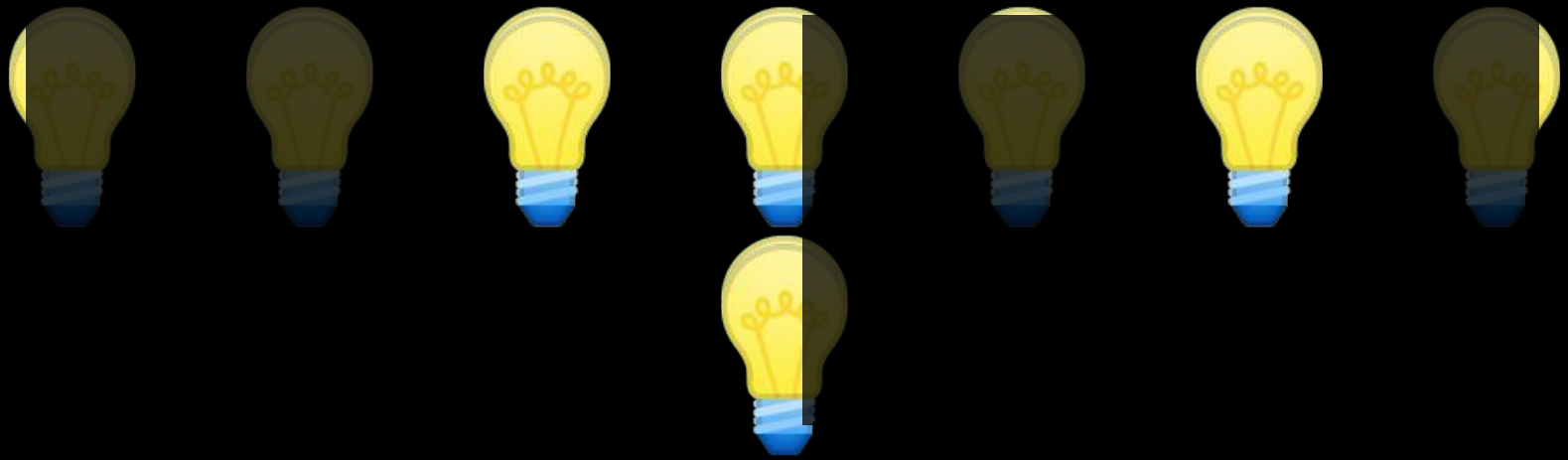


A

65

01000001

65

ASCII

...	A	B	C	D	E	F	G	H	I	...
...	65	66	67	68	69	70	71	72	73	...

72 73 33

H

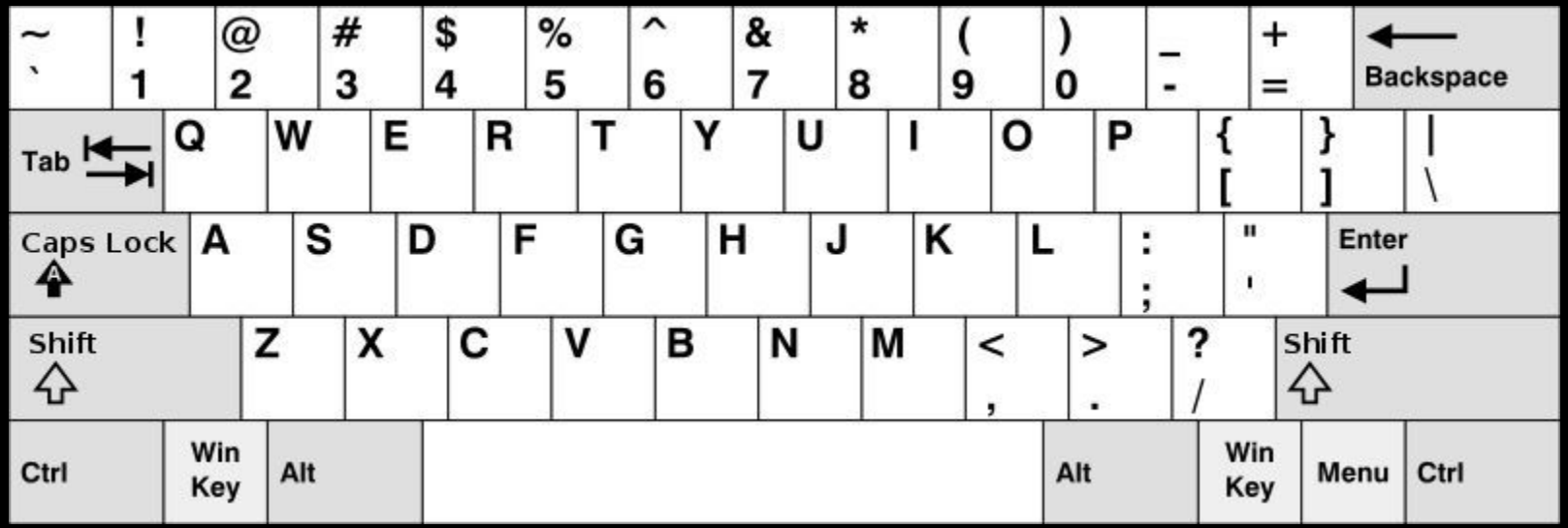
72

I

73

33

H	I	!
72	73	33


~ `
! 1
@ 2
# 3
$ 4
% 5
^ 6
& 7
* 8
(9
) 0
_ -
+ =
Backspace
Tab
Q
W
E
R
T
Y
U
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{ [
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| \
Caps Lock
A
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F
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K
L
: ;
" '
Enter
Shift
Z
X
C
V
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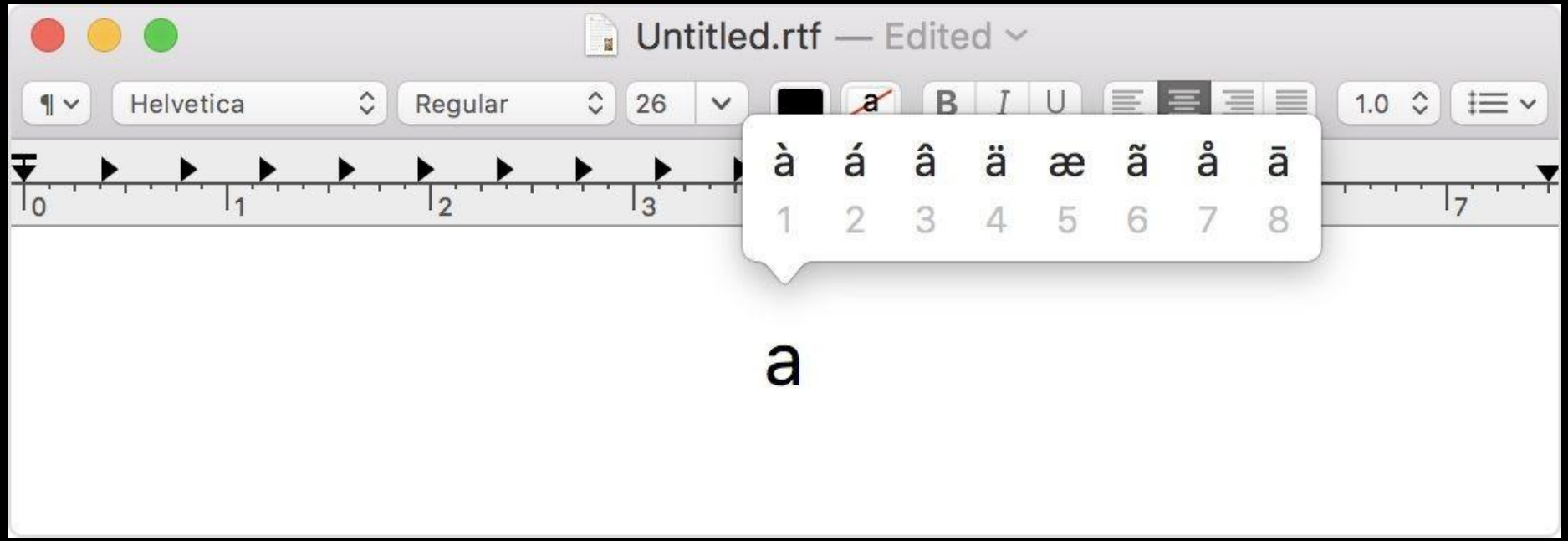
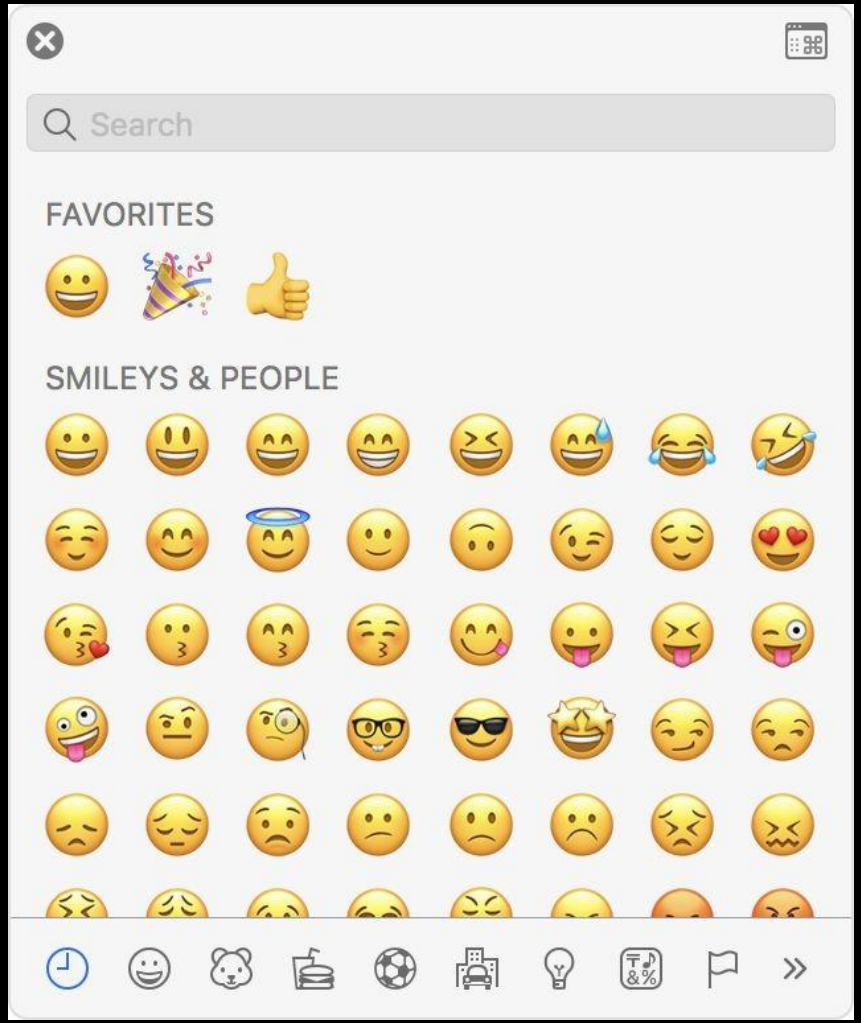
? /
Shift
Ctrl
Win Key
Alt
Alt
Win Key
Menu
Ctrl


Untitled.rtf — Edited
Helvetica
Regular
26
1.0
à á â ä æ ã å ā
1 2 3 4 5 6 7 8
a

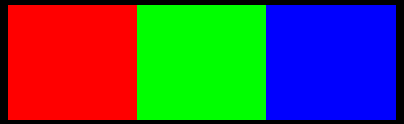

Search
FAVORITES
SMILEYS & PEOPLE

Unicode

128514

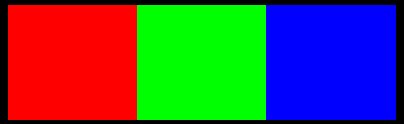
1111101100000010

RGB



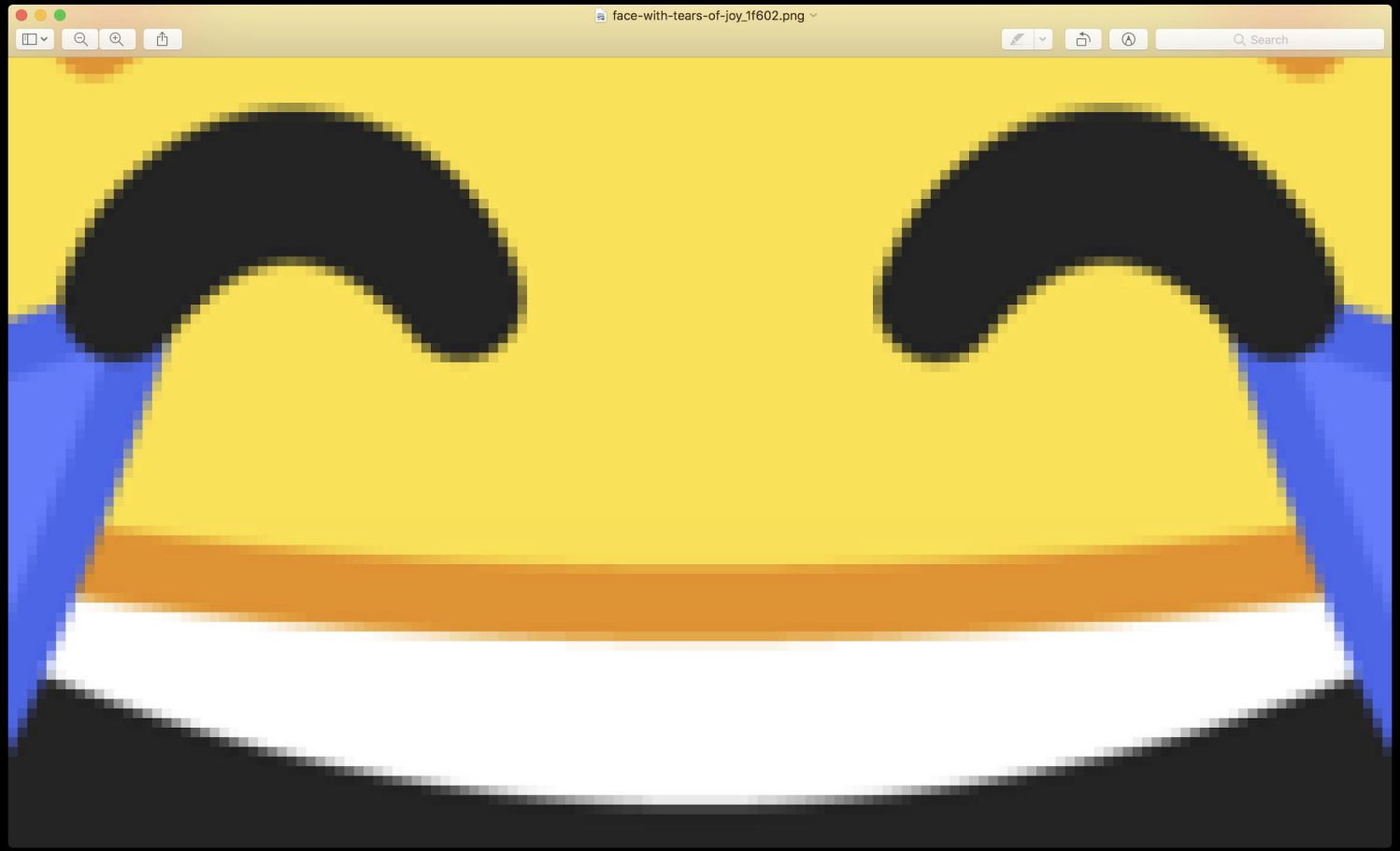
72 73 33

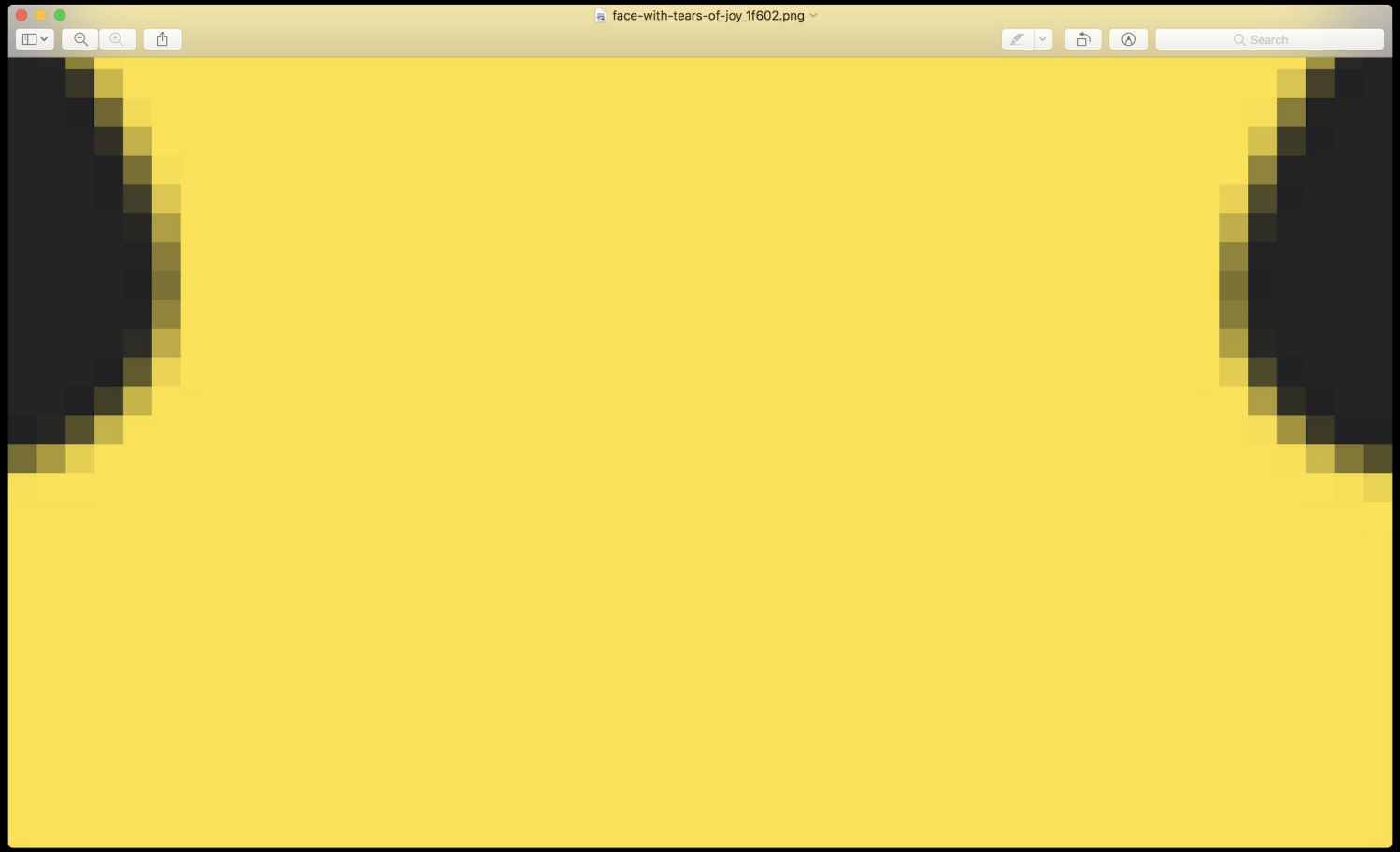
72
73
33

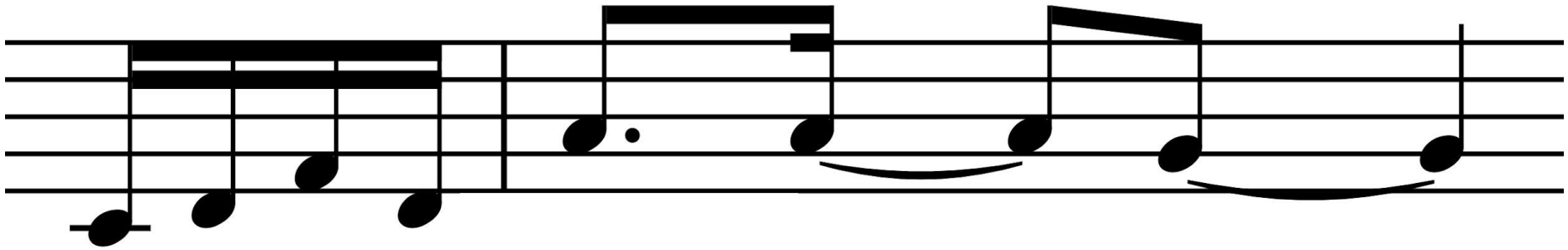


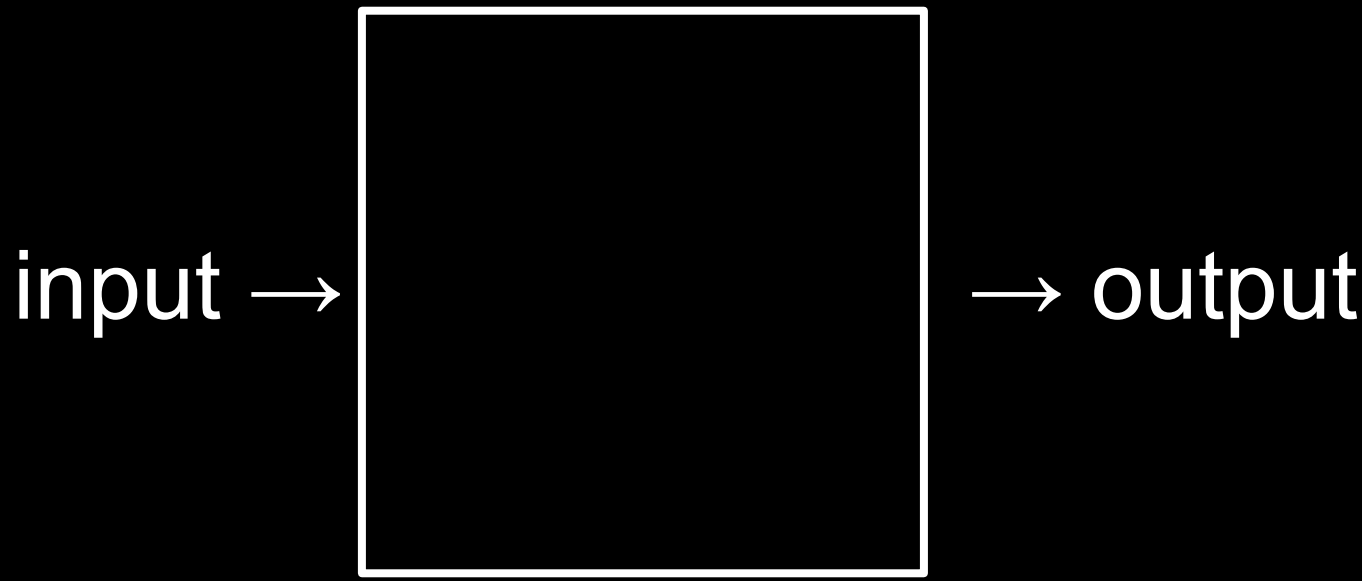
face-with-tears-of-joy_1f602.png

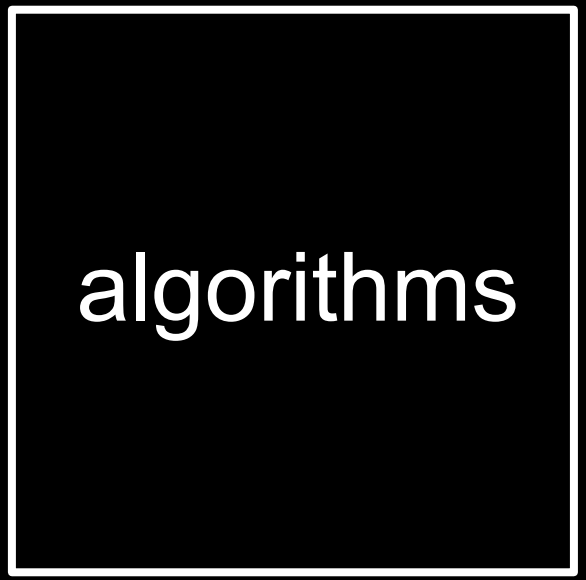
face-with-tears-of-joy_1f602.png


face-with-tears-of-joy_1f602.png
Search

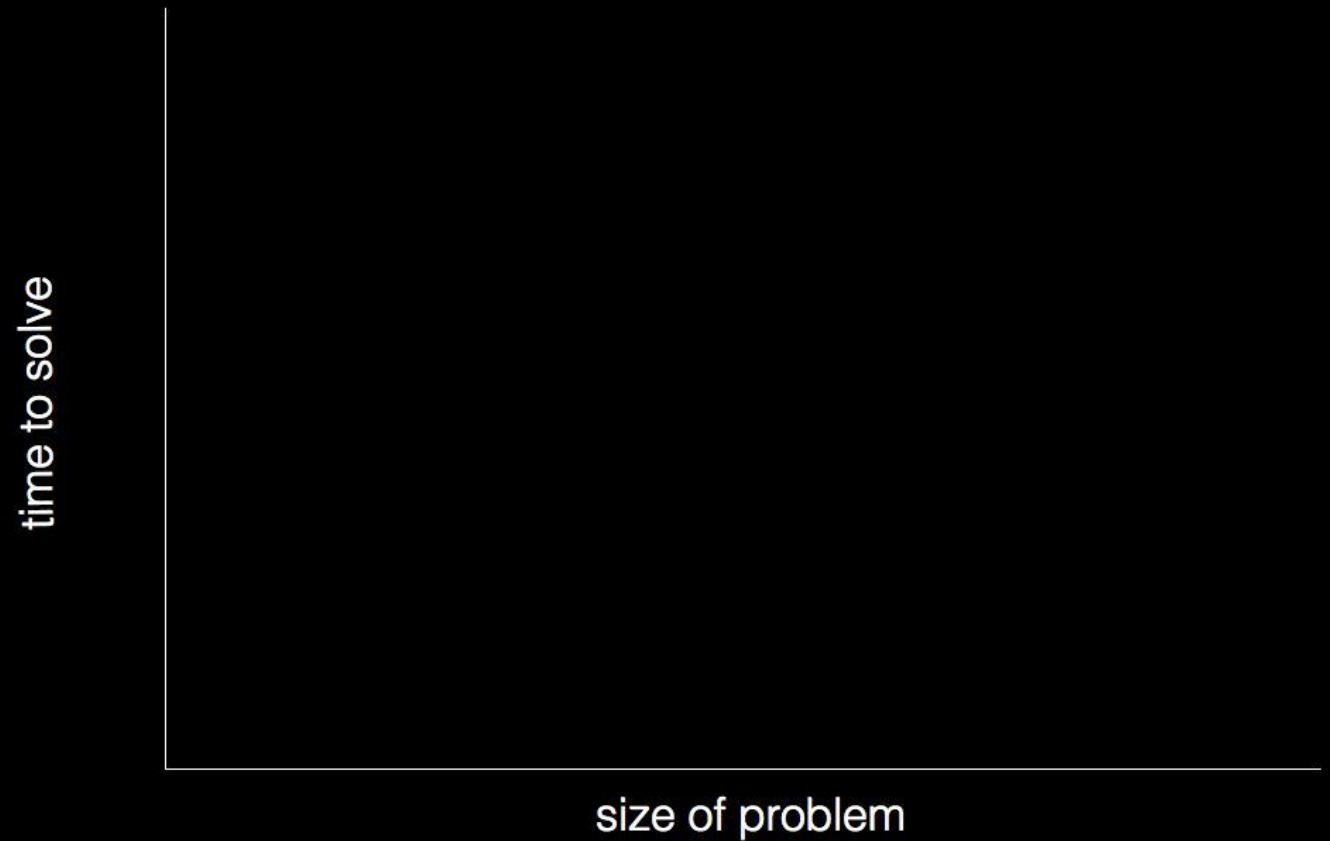

face-with-tears-of-joy_1f602.png
Search

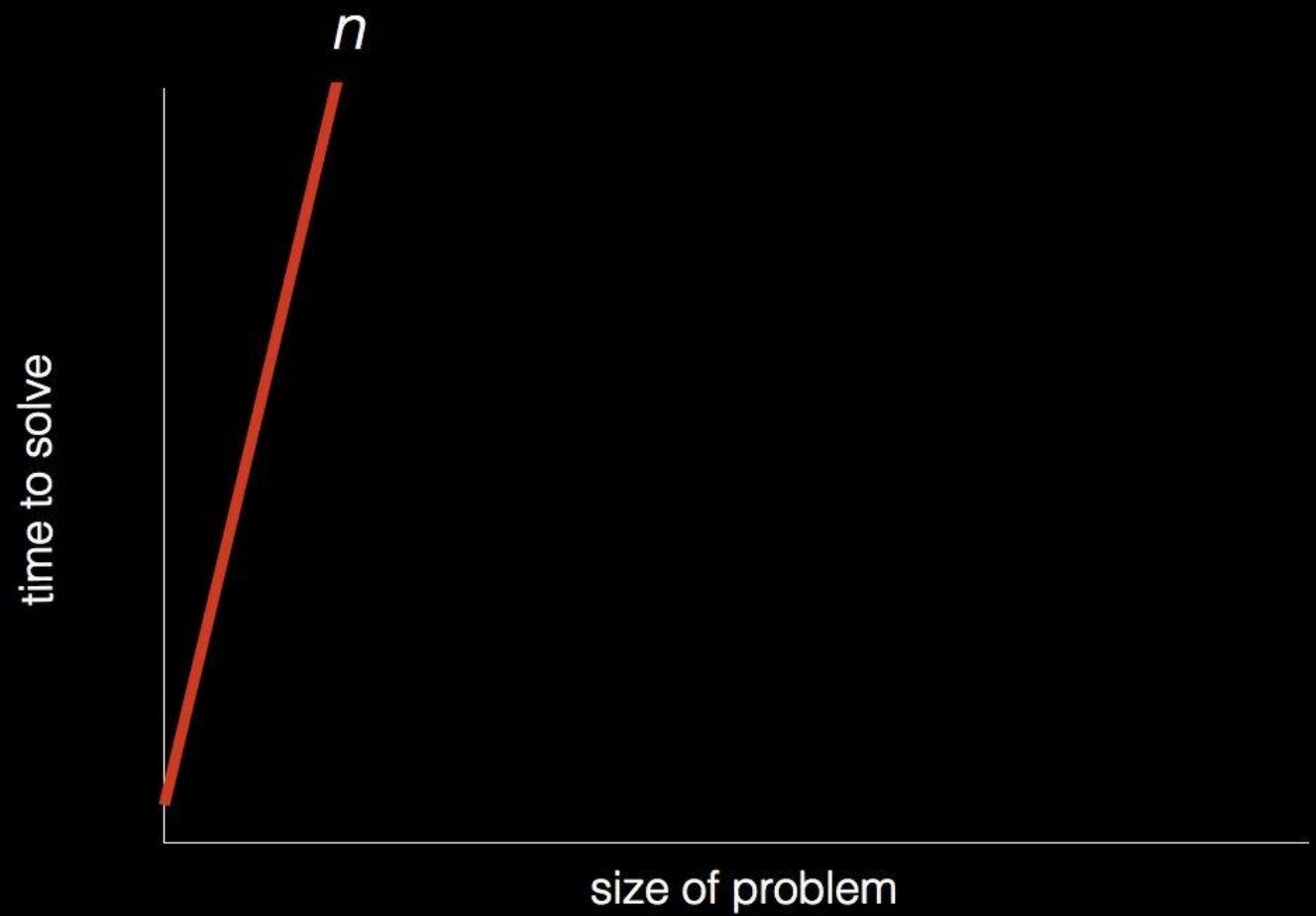


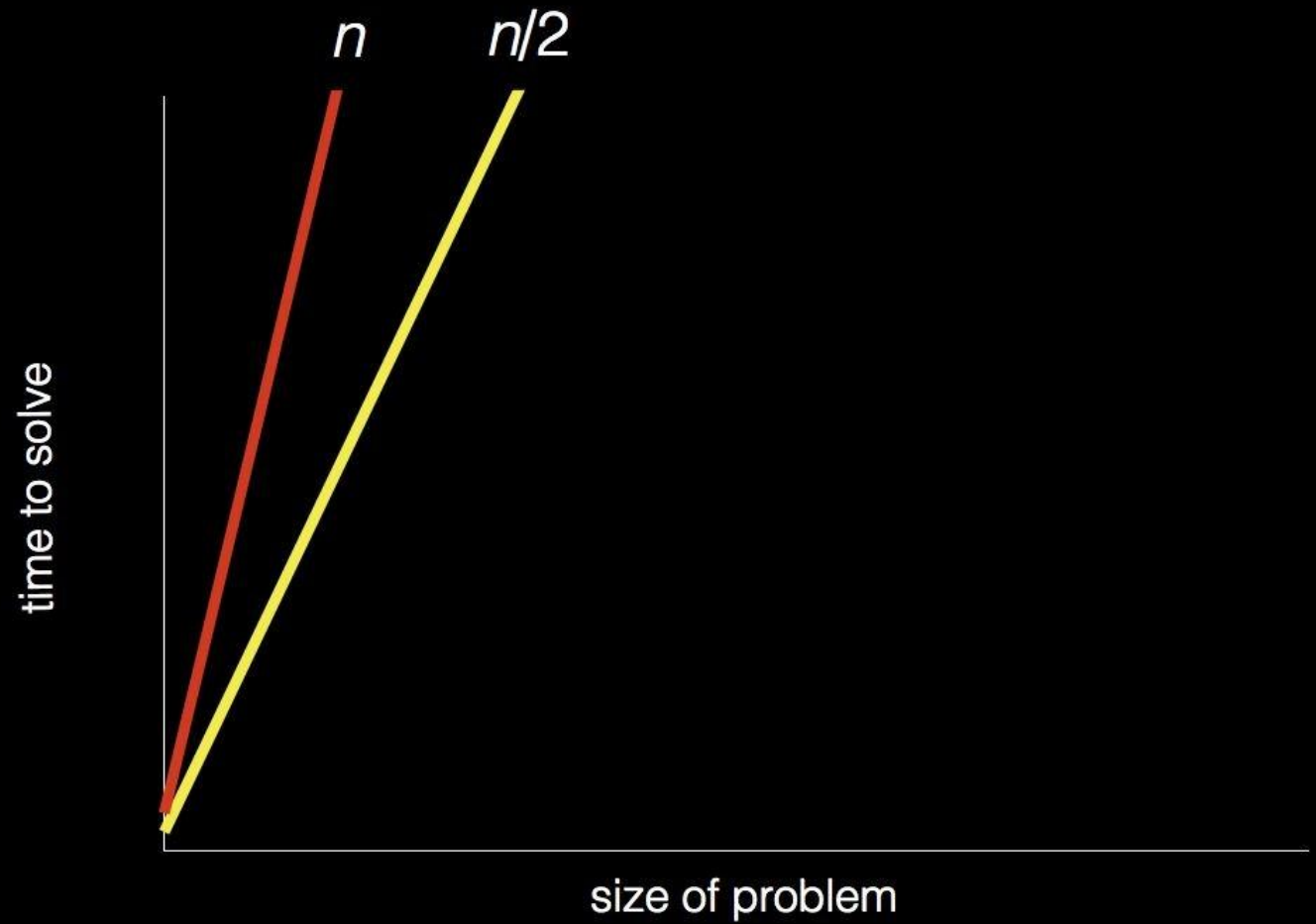

input →
→ output

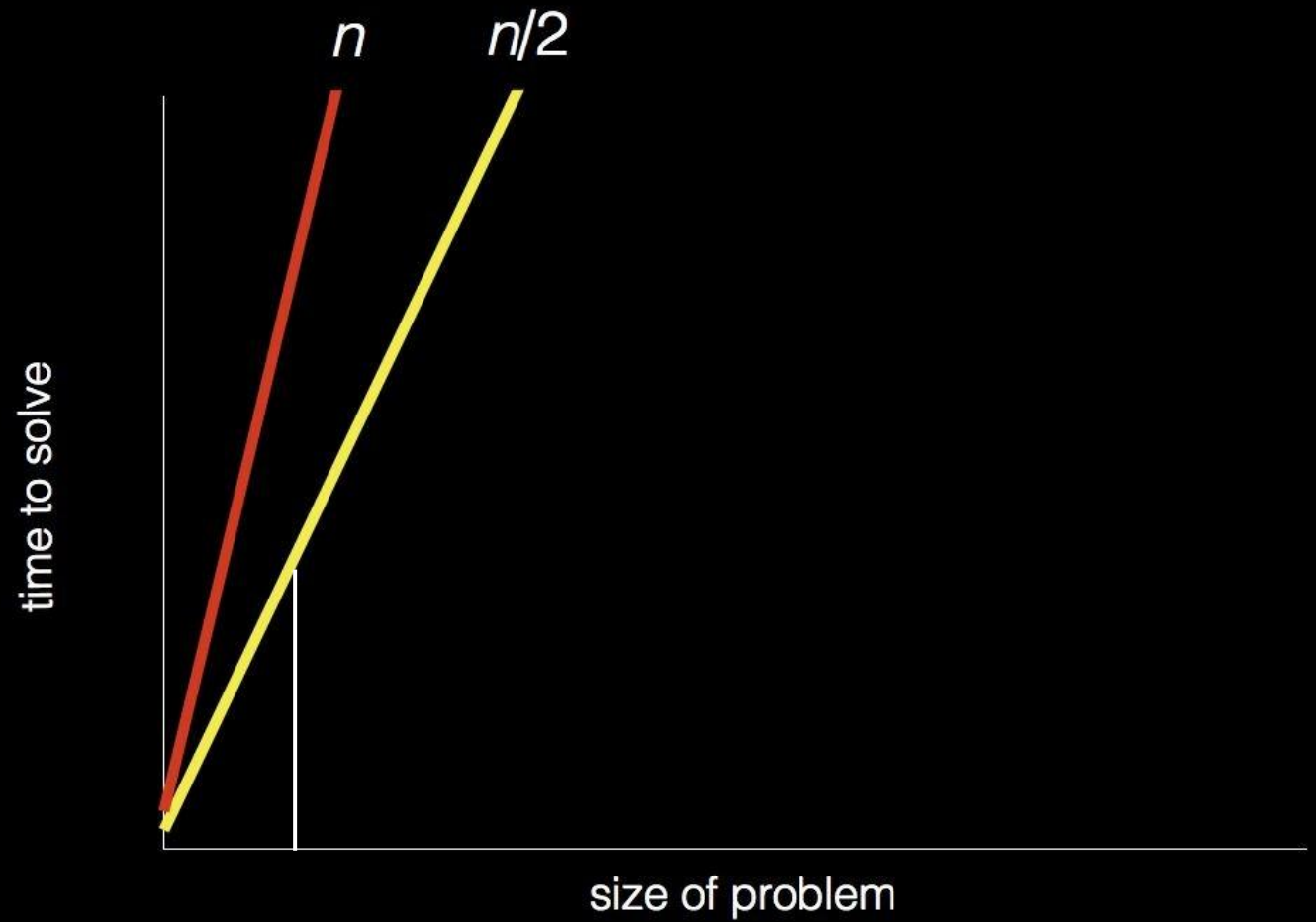

algorithms

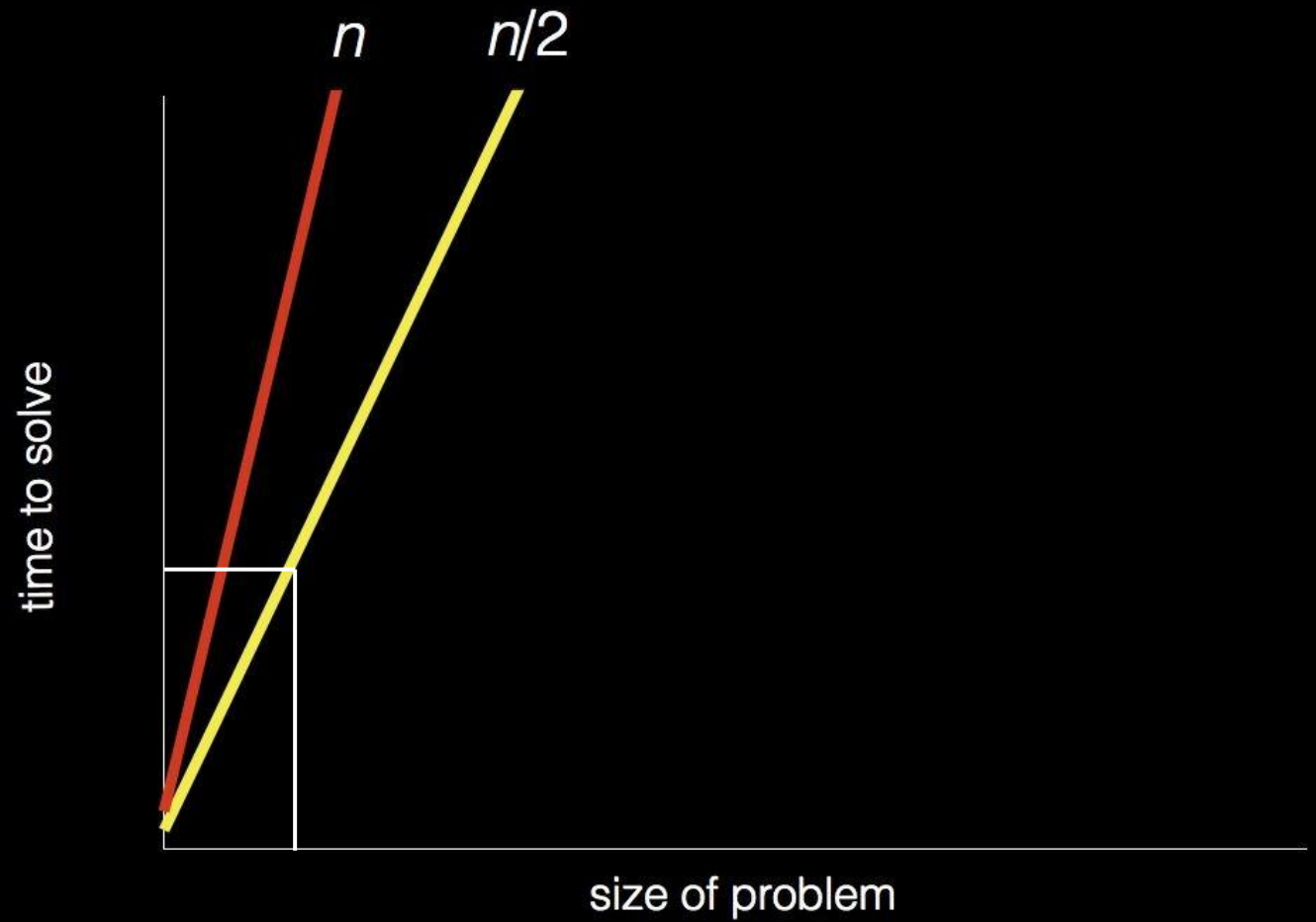
1024
512
256
128
64
32
16
8
4
2
1

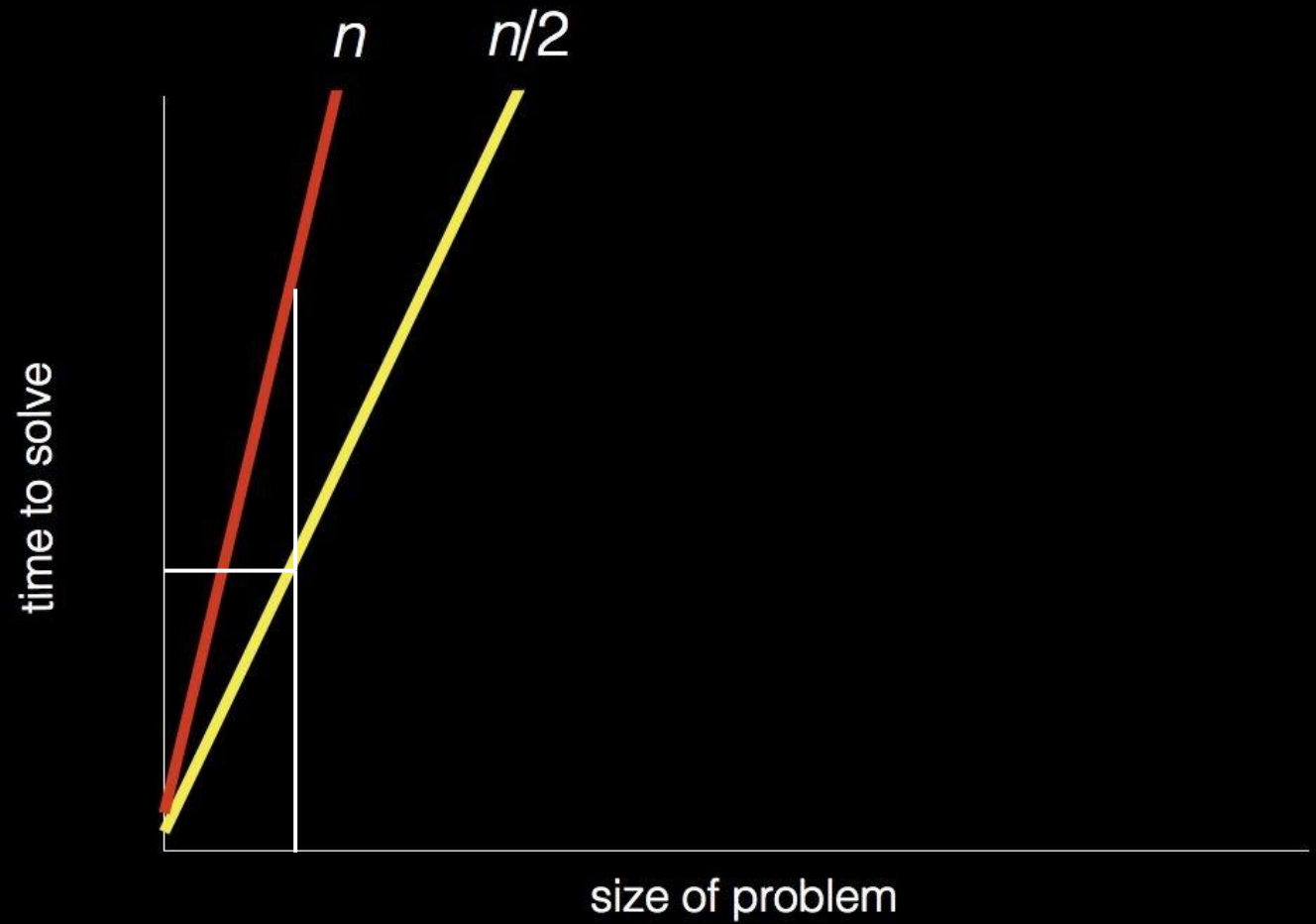

time to solve
size of problem

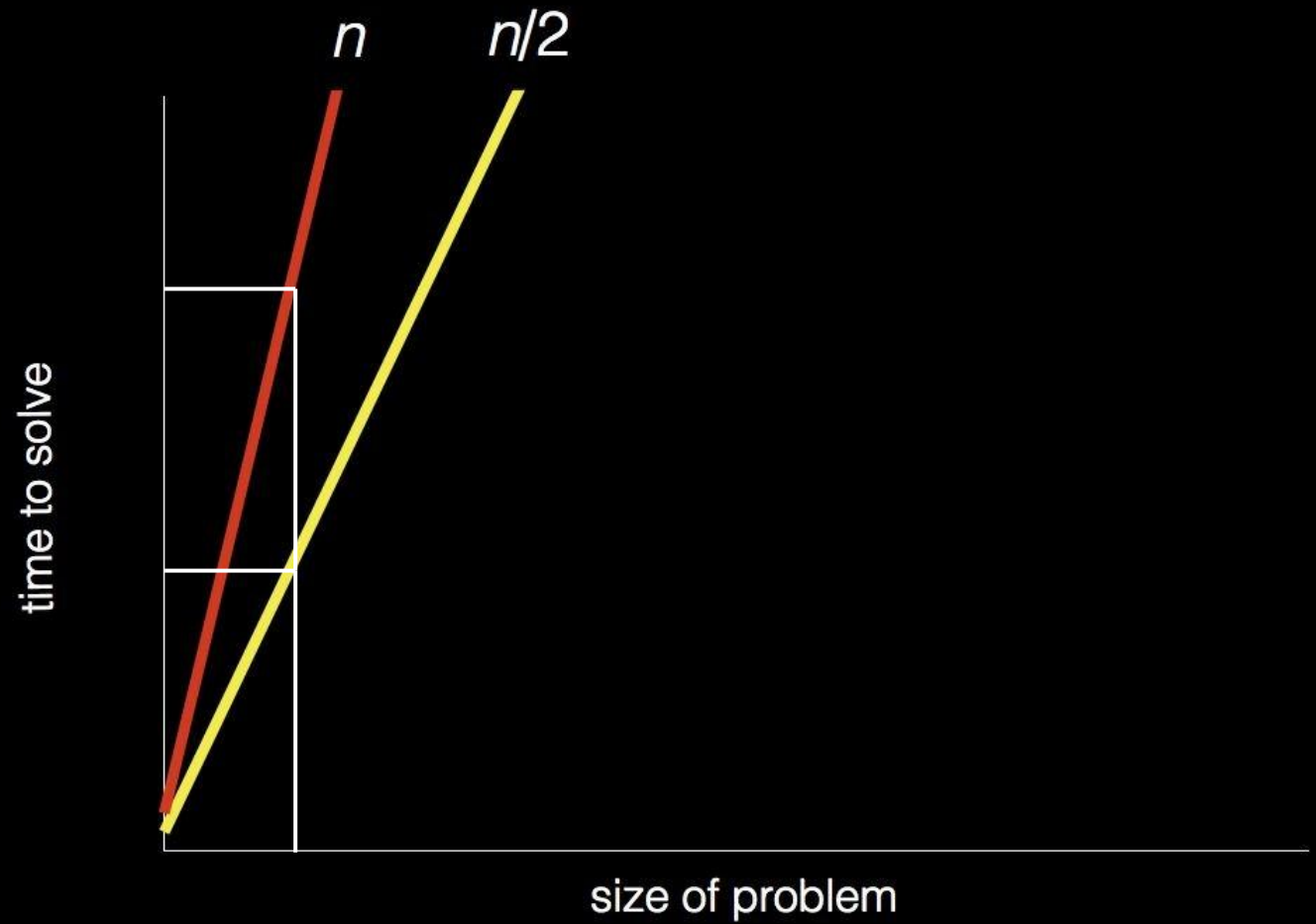

n
time to solve
size of problem

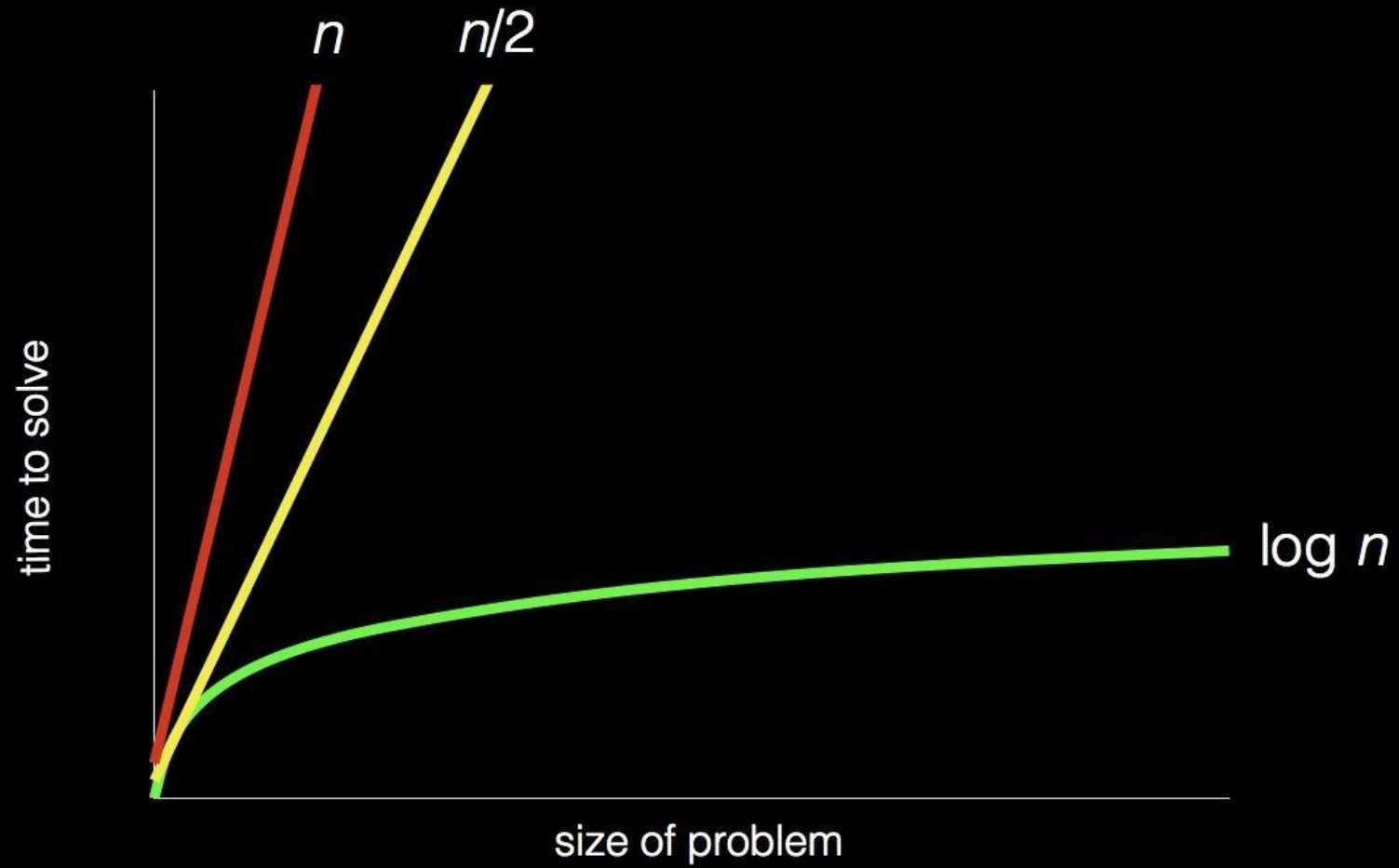

n
n/2
time to solve
size of problem


n
n/2
time to solve
size of problem


n
n/2
time to solve
size of problem


n
n/2
time to solve
size of problem


n
n/2
time to solve
size of problem


n
n/2
log n
time to solve
size of problem

pseudocode

```
 1   Pick up phone book
 2   Open to middle of phone book
 3   Look at page
 4   If Smith is on page
 5       Call Mike
 6   Else if Smith is earlier in book
 7       Open to middle of left half of book
 8       Go back to line 3
 9   Else if Smith is later in book
10       Open to middle of right half of book
11       Go back to line 3
12   Else
```

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12   Else
```

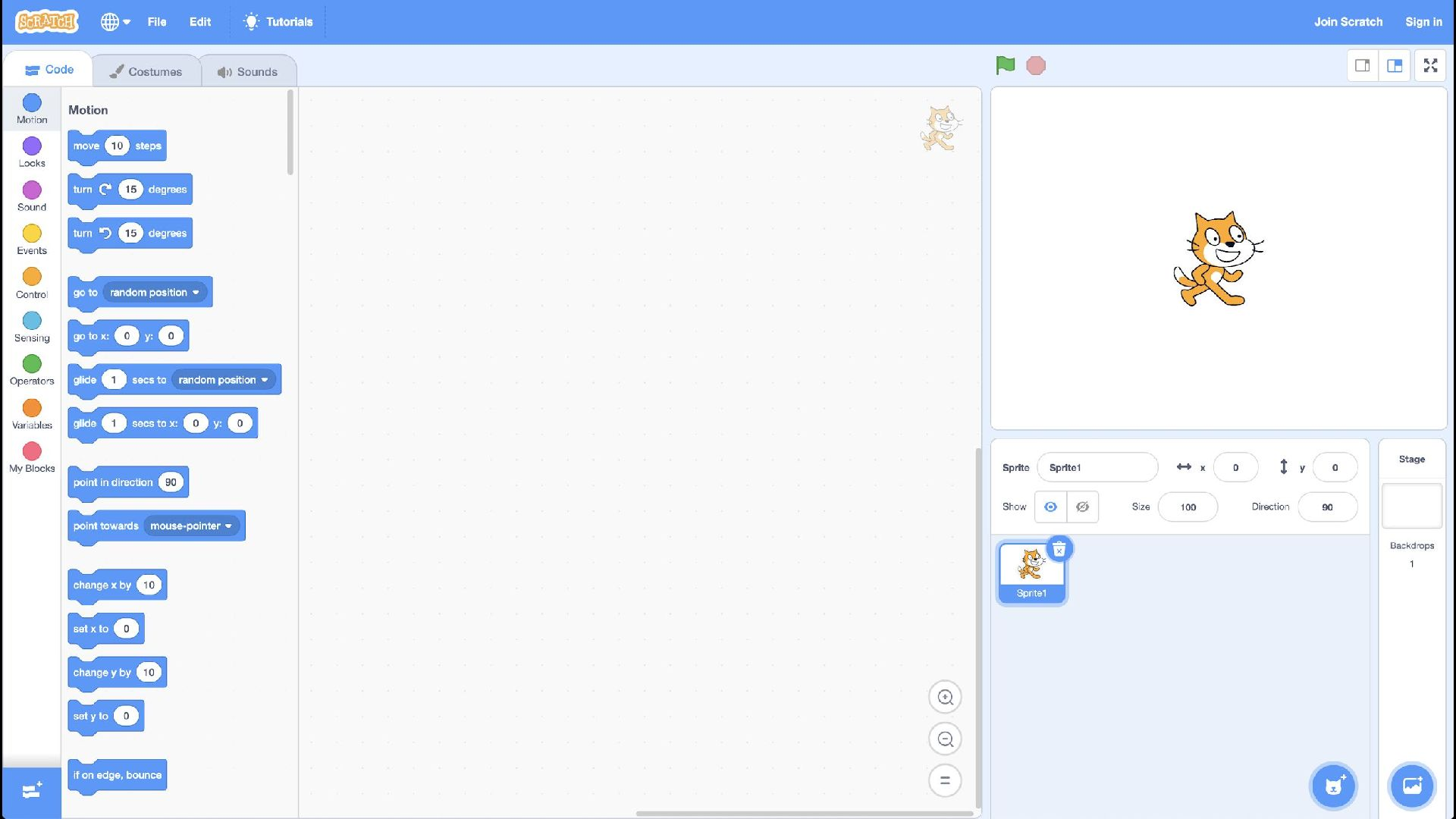
- functions
- conditions
- Boolean expressions
- loops

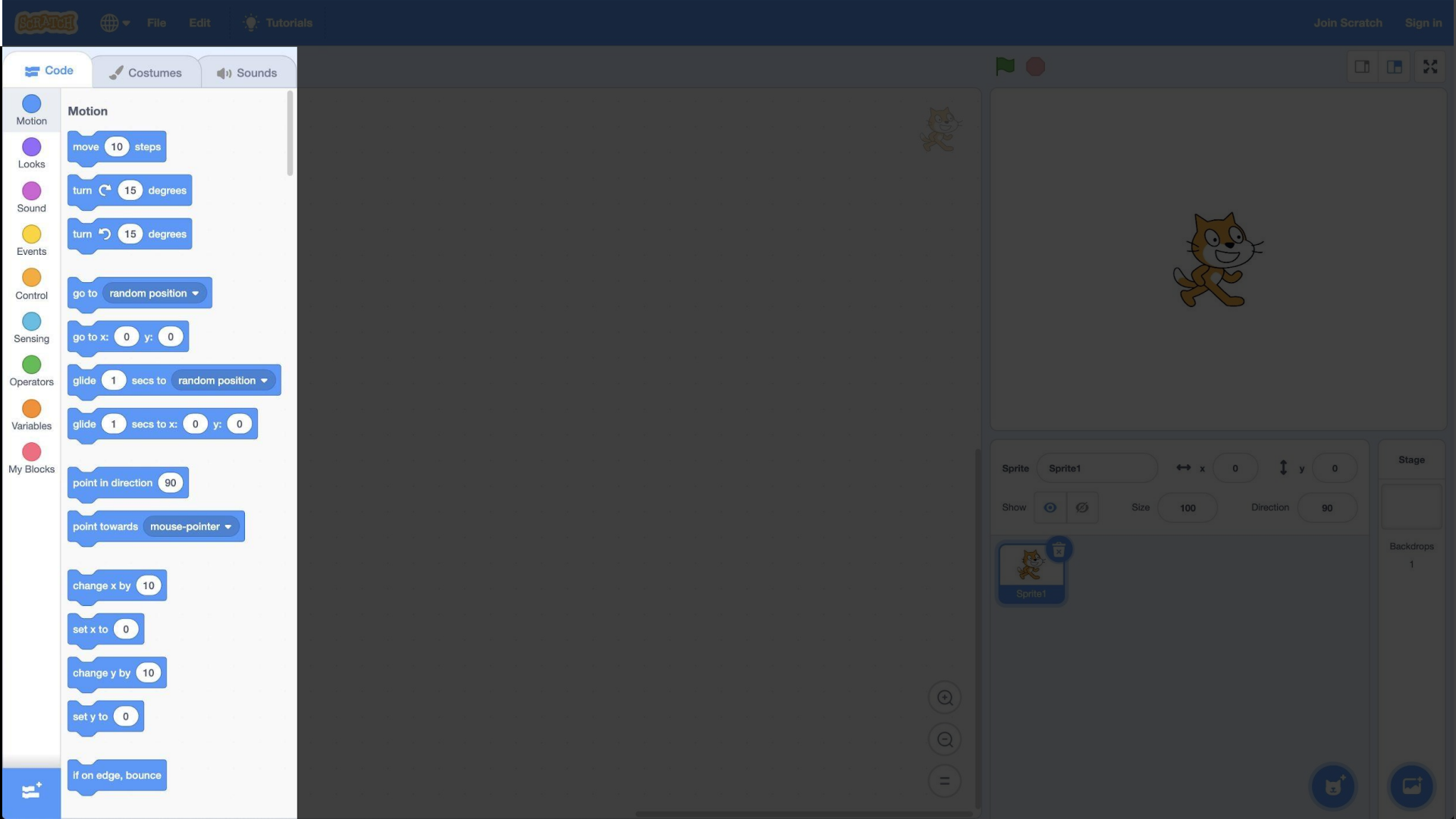
- functions
- conditions
- Boolean expressions
- loops
- variables
- threads
- events
- ...

```c
#include <stdio.h>

int main(void)
{
    printf("hello, world\n");
}
```

when clicked
say
hello, world


File
Edit
Tutorials
Join Scratch
Sign in
Code
Costumes
Sounds
Motion
Locks
Sound
Events
Control
Sensing
Operators
Variables
My Blocks
Motion
move 10 steps
turn 15 degrees
turn 15 degrees
go to random position
go to x: 0 y: 0
glide 1 secs to random position
glide 1 secs to x: 0 y: 0
point in direction 90
point towards mouse-pointer
change x by 10
set x to 0
change y by 10
set y to 0
if on edge, bounce
Sprite
Sprite1
x
0
y
0
Show
Size
100
Direction
90
Sprite1
Stage
Backdrops
1


File
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Tutorials
Join Scratch
Sign in
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Costumes
Sounds
Motion
Looks
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Control
Sensing
Operators
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My Blocks
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point towards mouse-pointer
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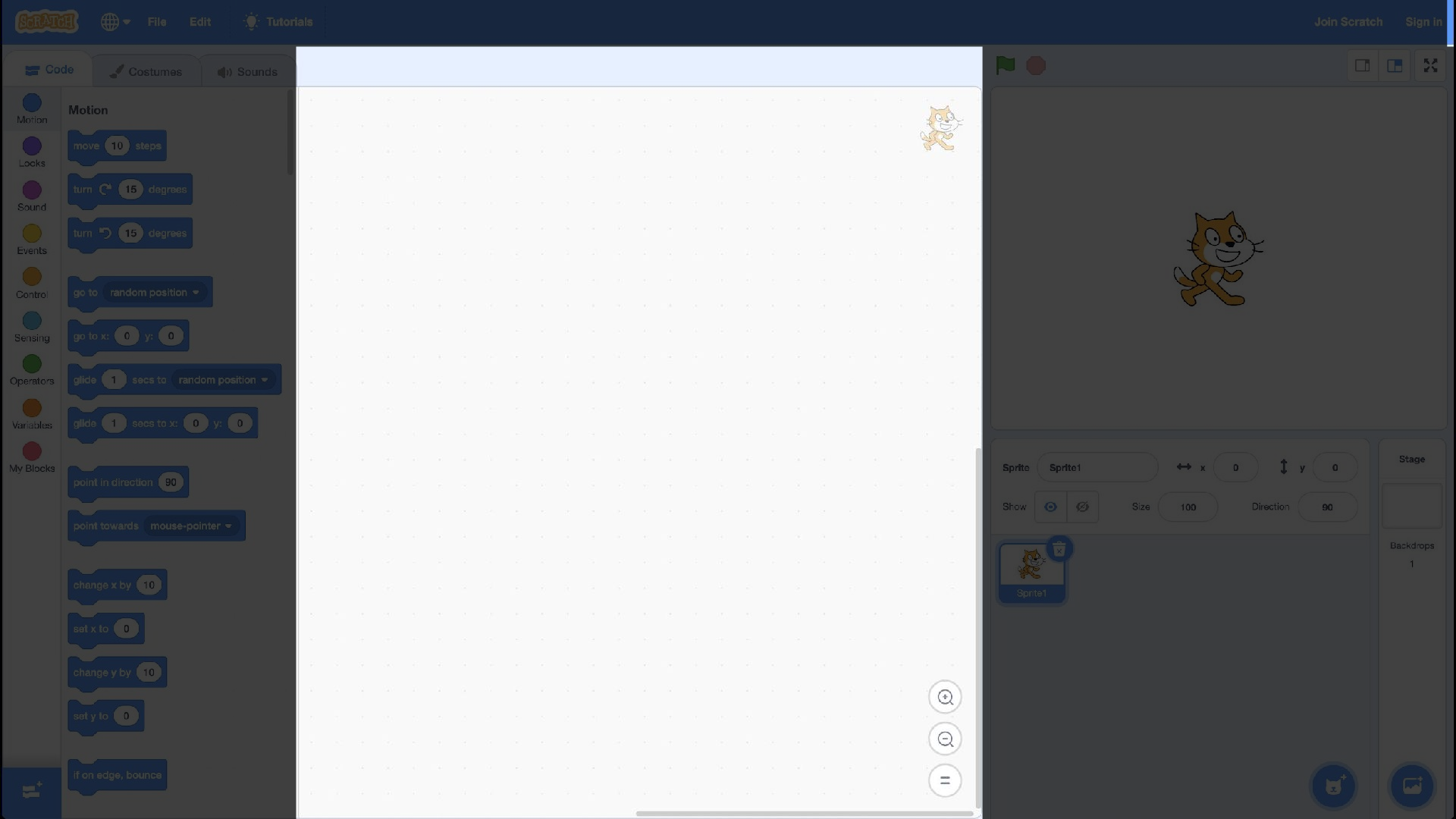
set x to 0
change y by 10
set y to 0
if on edge, bounce
Sprite
Sprite1
x 0
y 0
Show
Size 100
Direction 90
Stage
Backdrops 1
Sprite1


File
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Join Scratch
Sign in
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Sounds
Motion
Looks
Sound
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Control
Sensing
Operators
Variables
My Blocks
Motion
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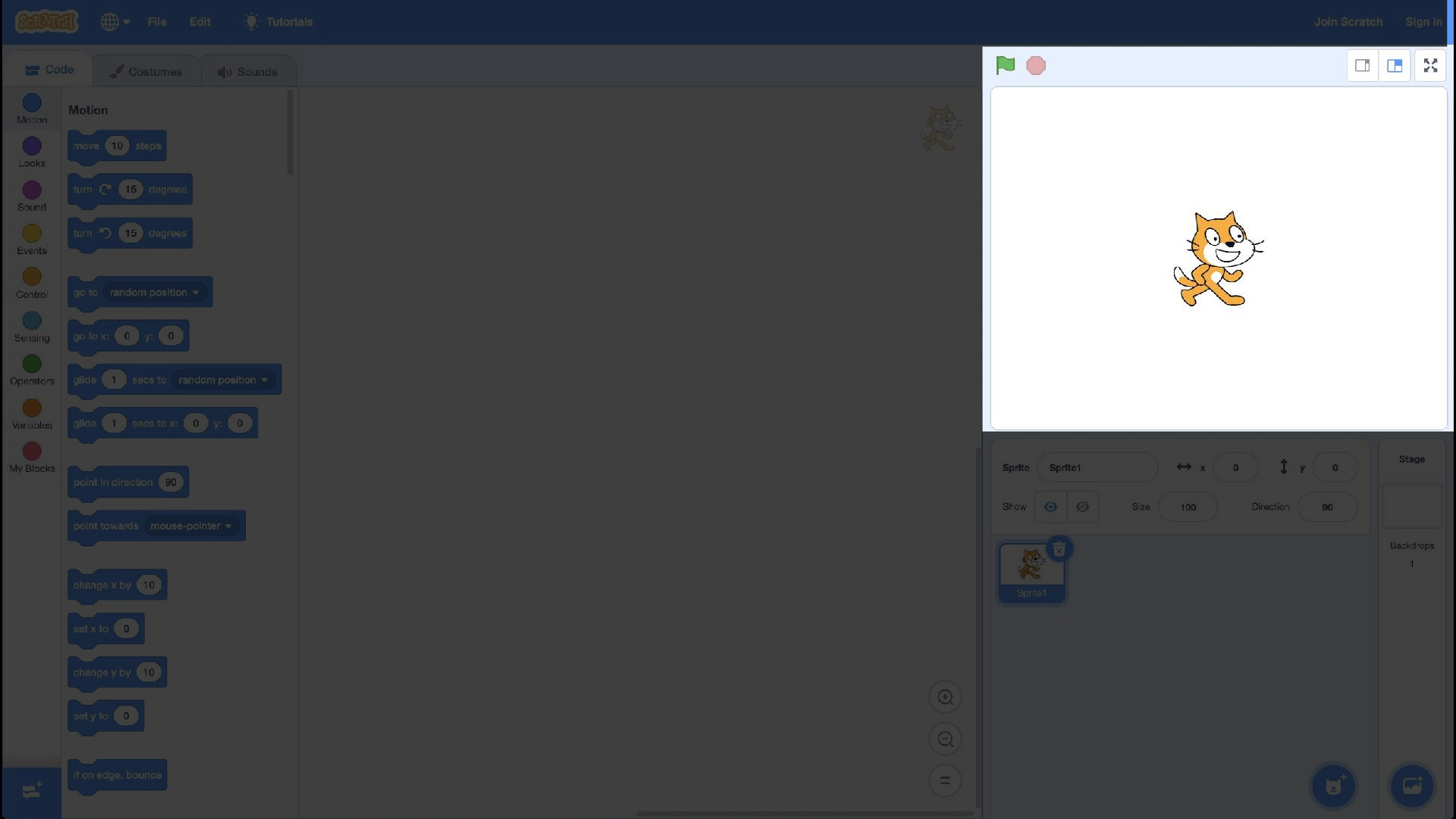
Sprite1
x 0
y 0
Show
Size 100
Direction 90
Stage
Backdrops 1


File
Edit
Tutorials
Join Scratch
Sign in
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Costumes
Sounds
Motion
Looks
Sound
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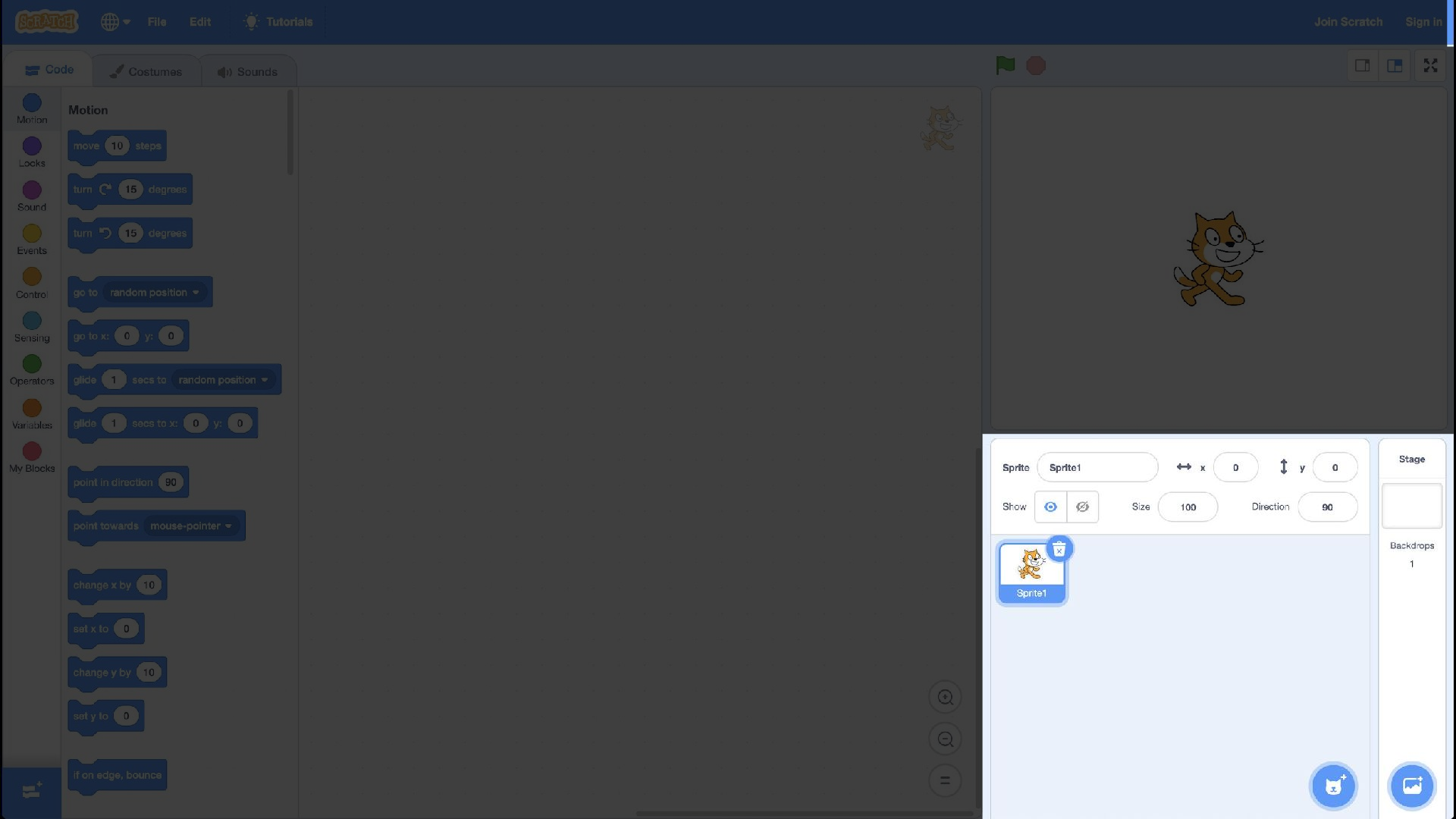
Show
Size 100
Direction 90
Stage
Backdrops 1


File
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Motion
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Sensing
Operators
Variables
My Blocks
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turn 15 degrees
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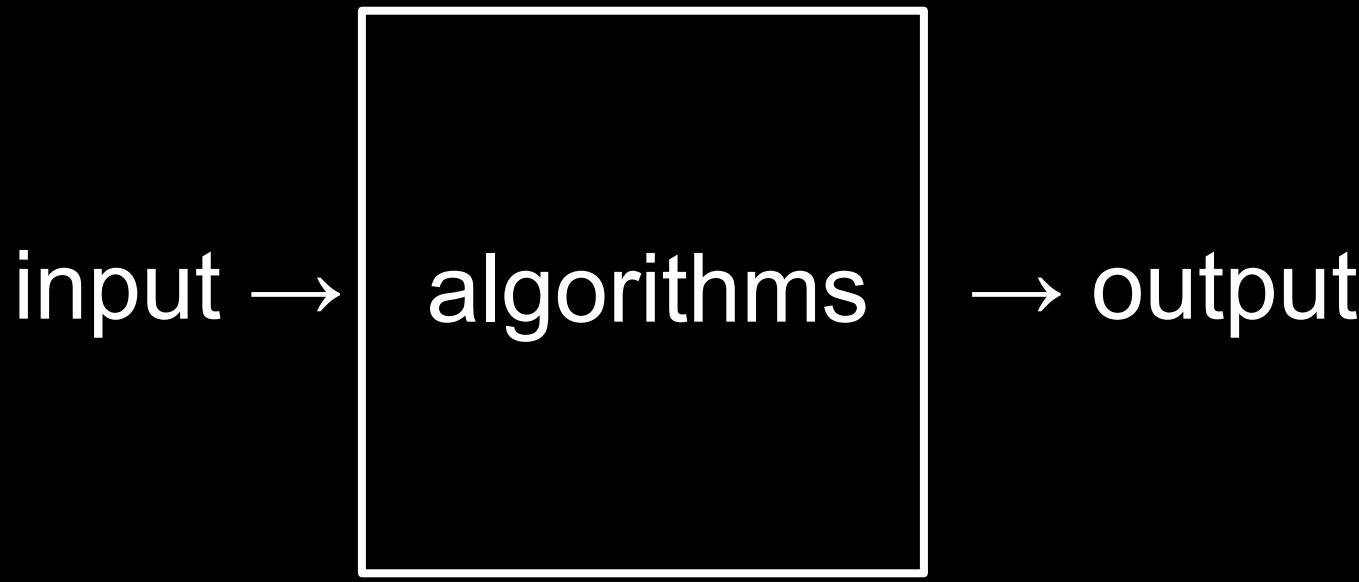
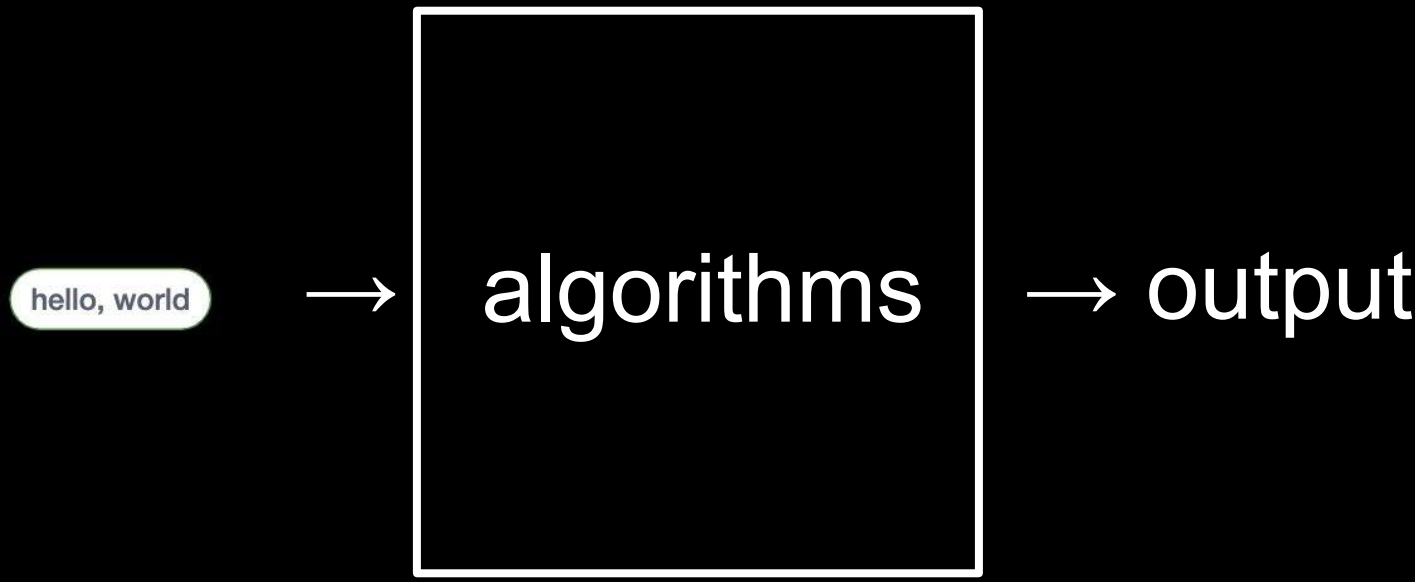
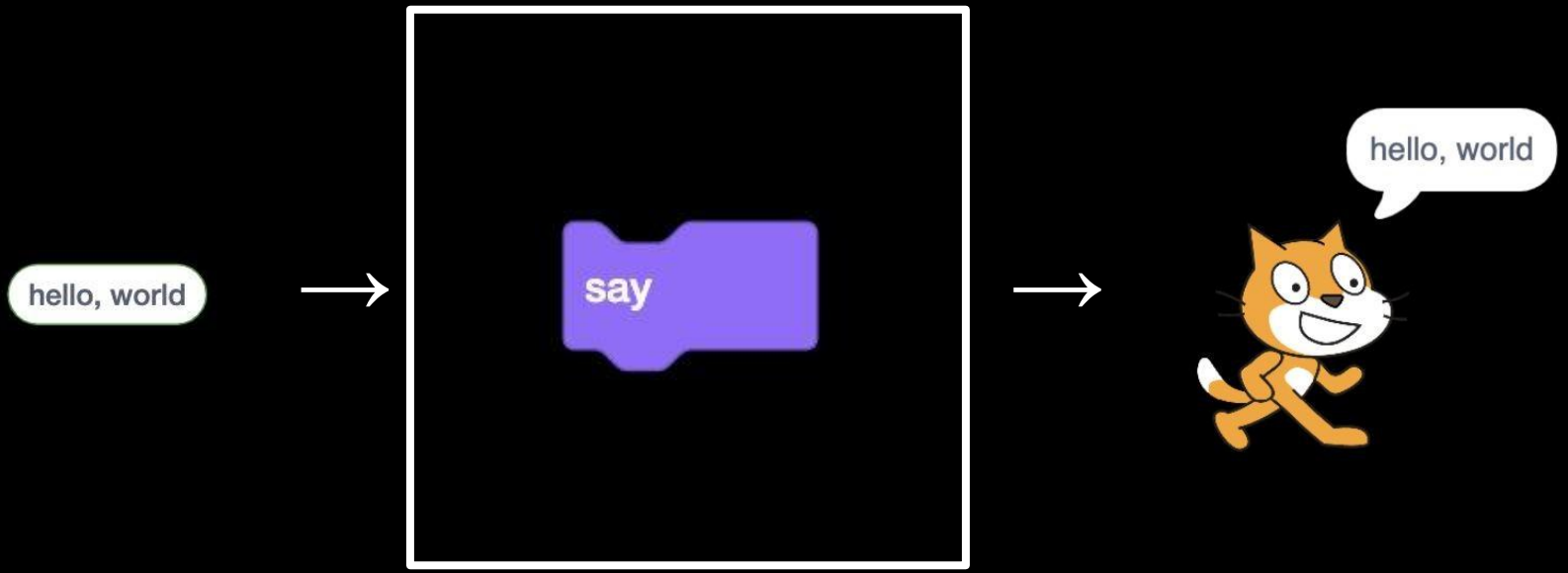
Sprite
Sprite1
x
0
y
0
Show
Size
100
Direction
90
Sprite1
Stage
Backdrops
1

say
hello, world

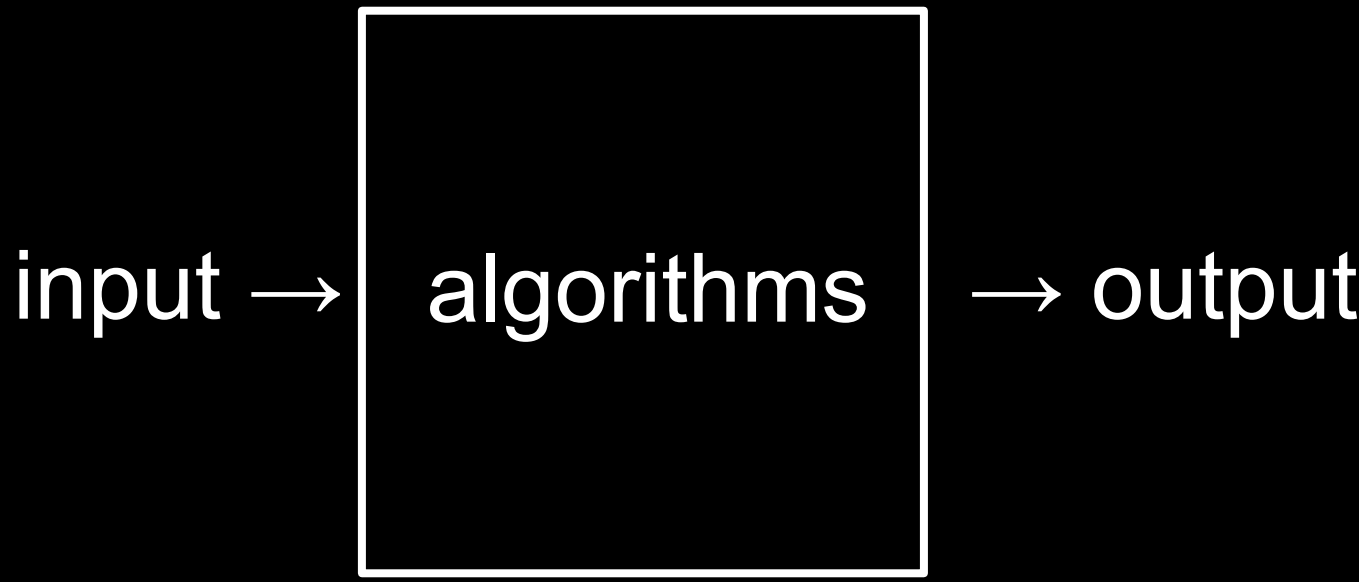

input →
algorithms
→ output

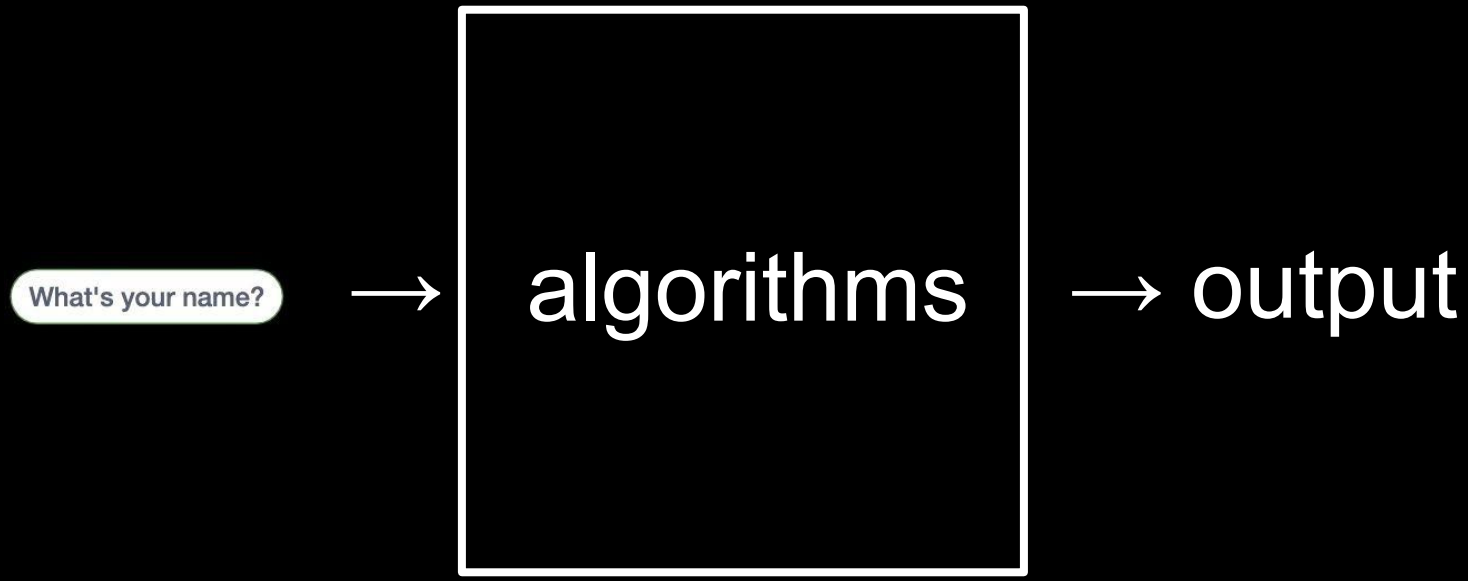

hello, world
algorithms
output

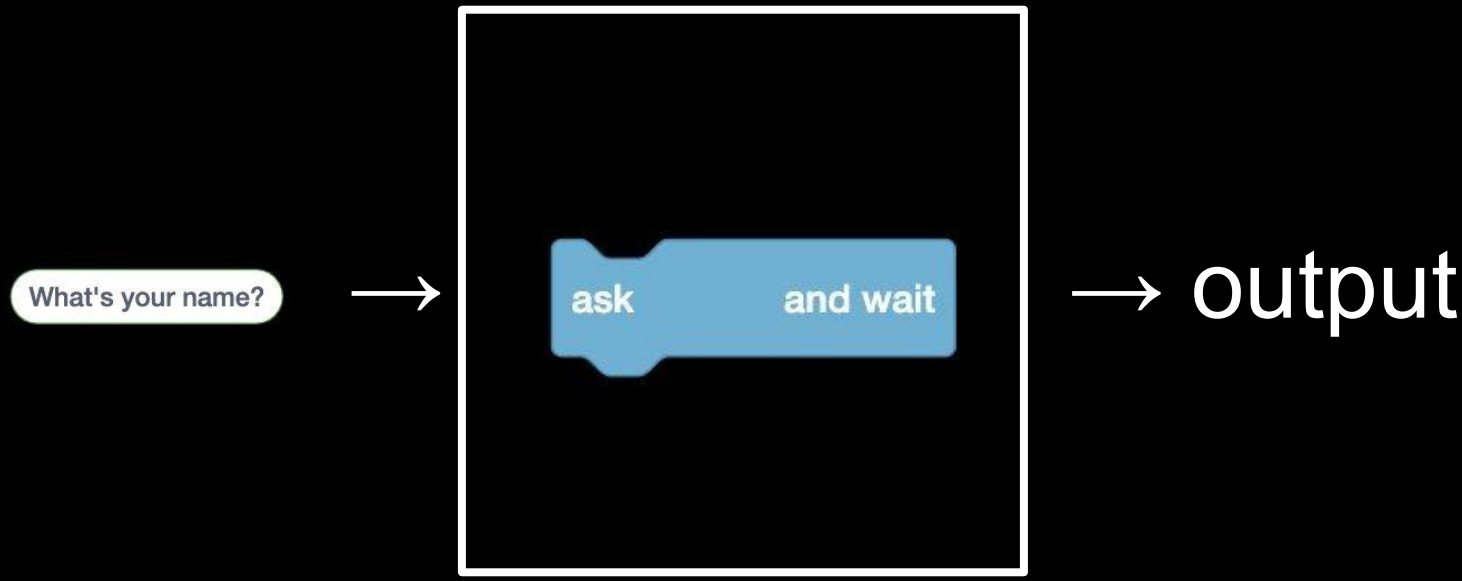
hello, world
say
output

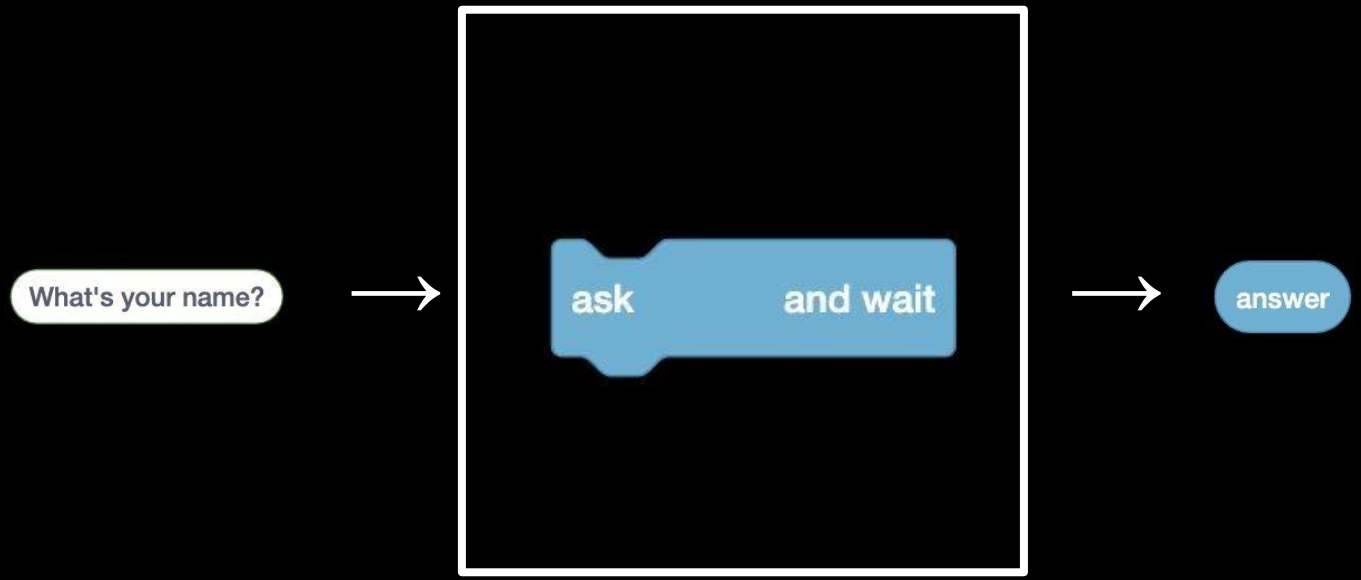

hello, world
say
hello, world

ask
What's your name?
and wait

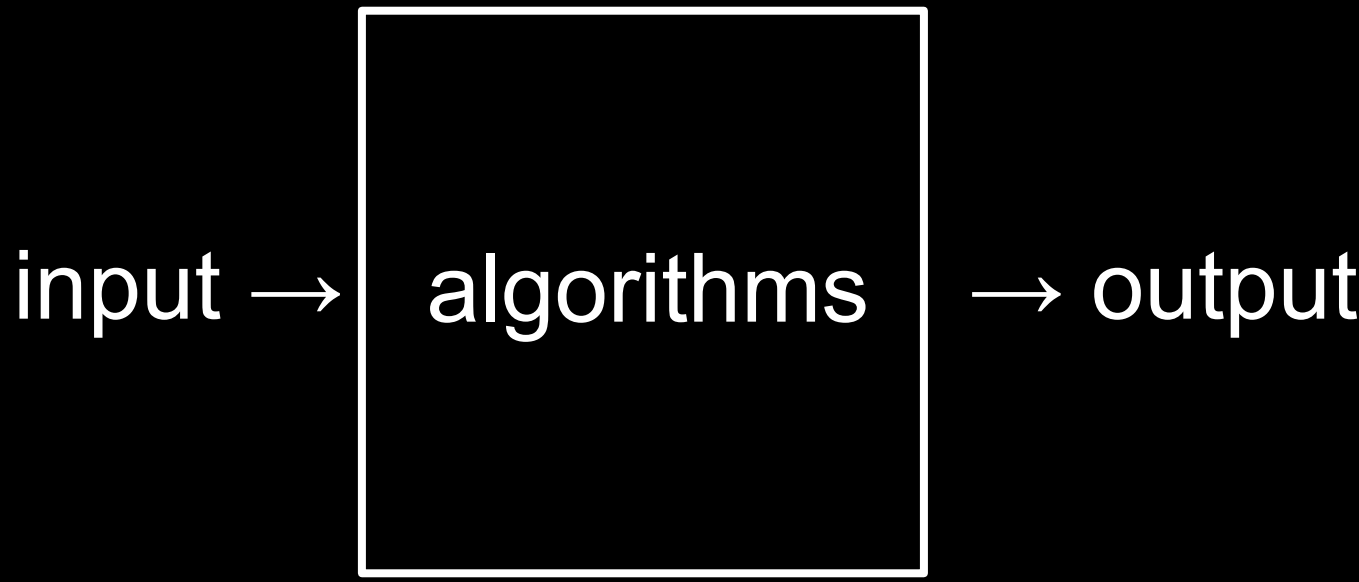

input →
algorithms
→ output

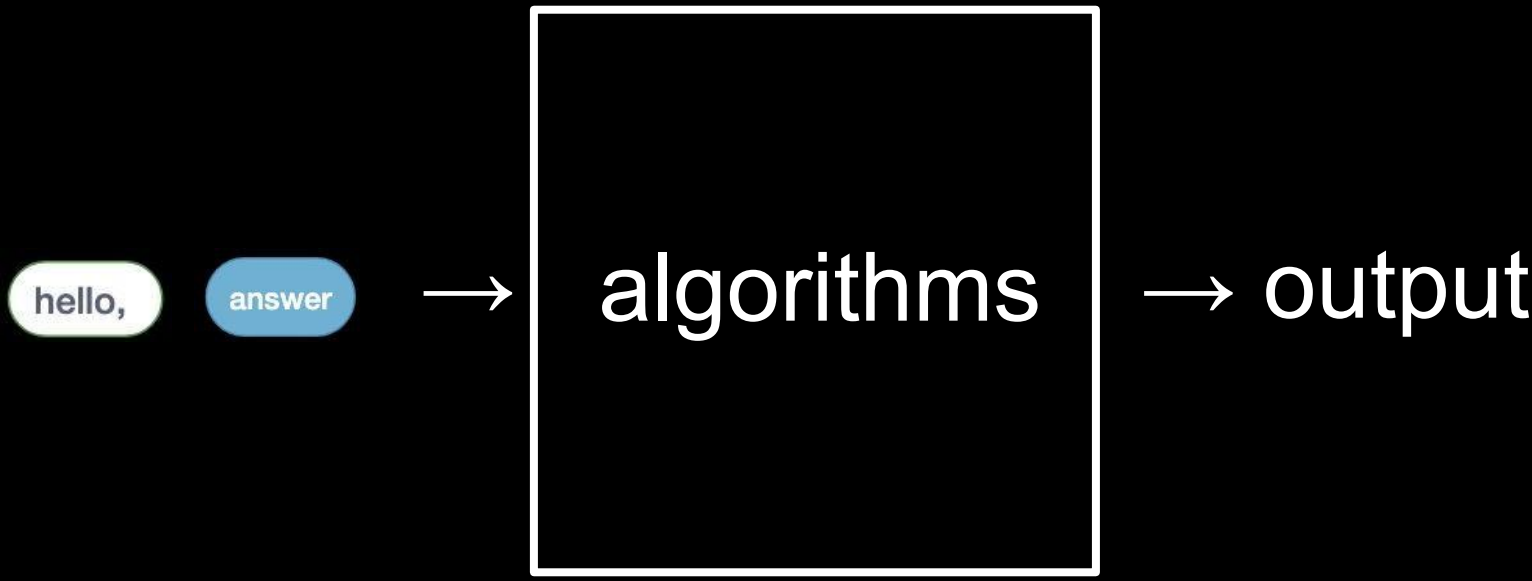

What's your name?
algorithms
output

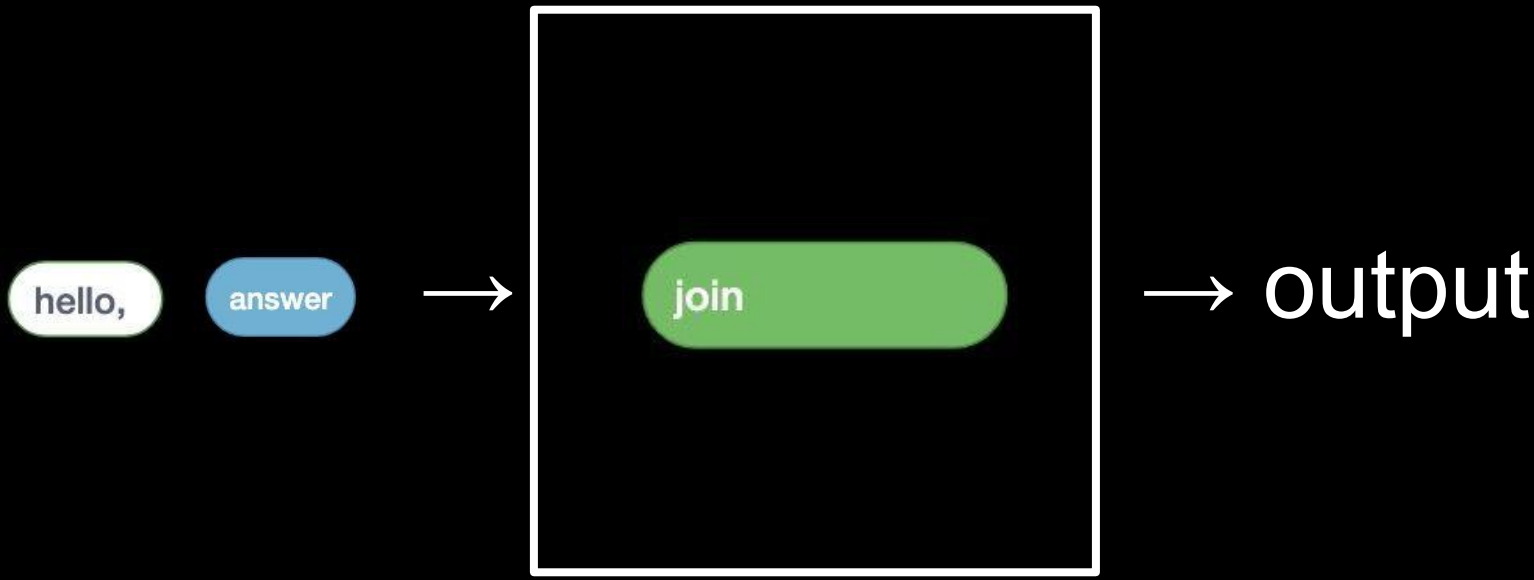

What's your name?
ask
and wait
output

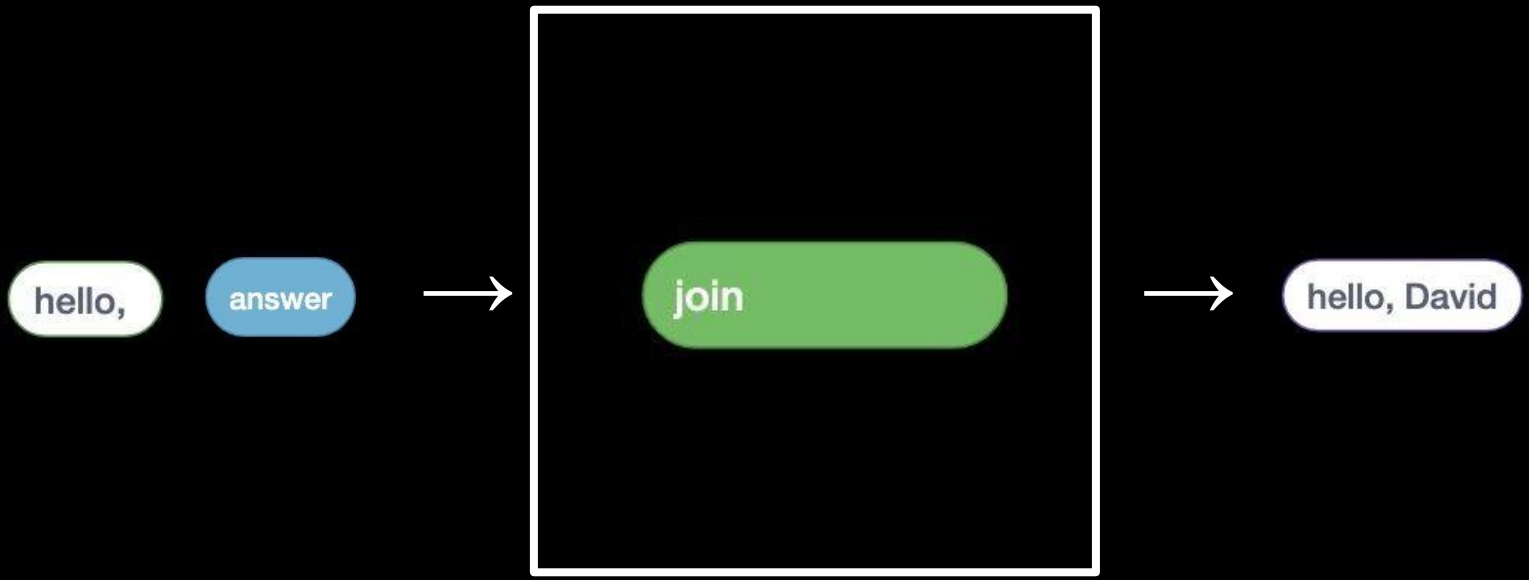

What's your name?
ask
and wait
answer

say
join
hello,
answer


input →
algorithms
→ output

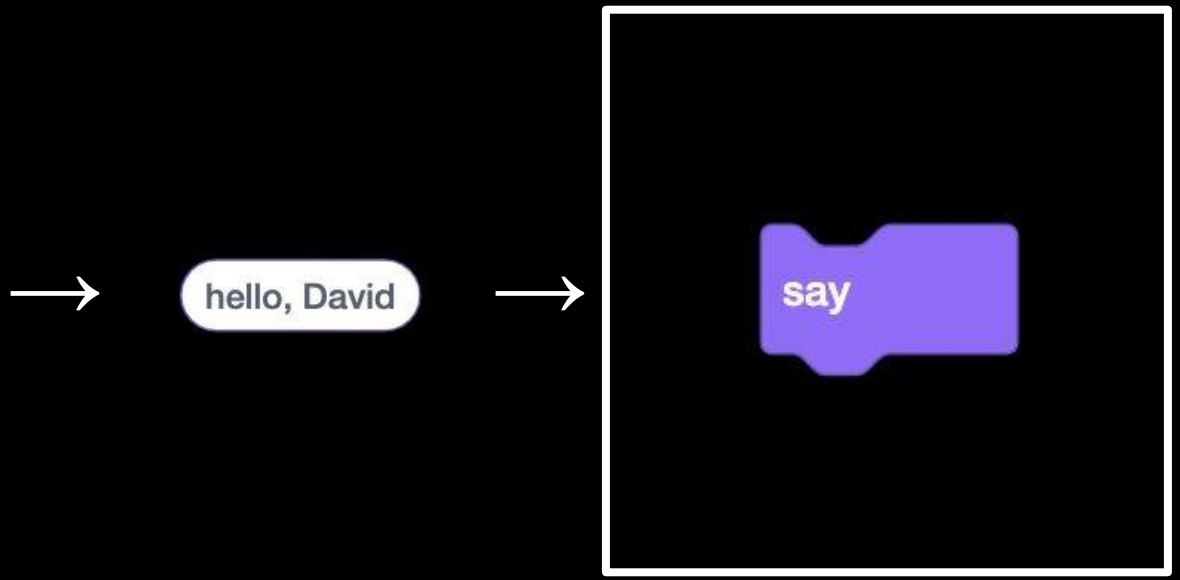

hello,
answer
algorithms
output


hello,
answer
join
output


hello,
answer
join
hello, David

hello, David

hello, David


hello, David
say

hello, David
say
hello, David

This is CS50