

This is CS50

```
#include <stdio.h>

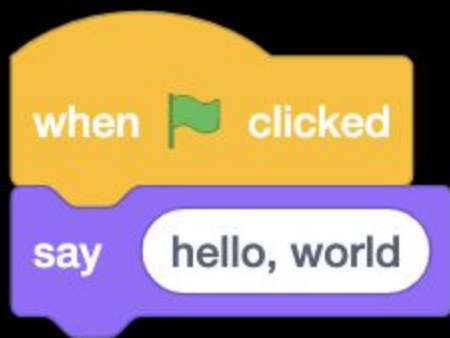
int main(void)
{
    printf("hello, world");
}
```

2/3

of CS50 students have never taken CS before

```
#include <stdio.h>

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



when  clicked

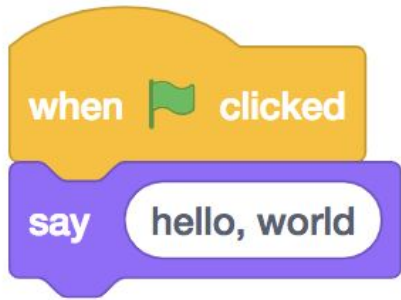
say 

- functions
- conditions
- Boolean expressions
- loops



GETTING REHEATED
FROM HOT
IS LIKE TRYING TO
GET A DRINK
FROM A
FIRE HOSE.





```
#include <stdio.h>

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

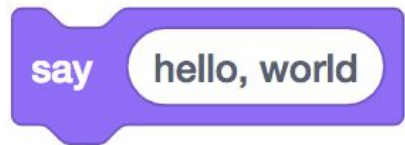


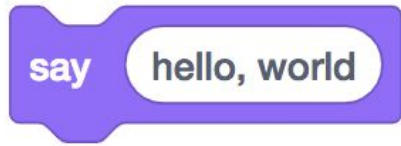

when  clicked



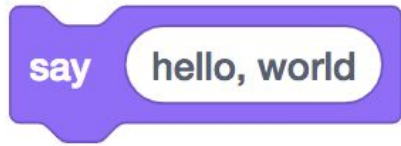
```
int main(void)
{
}
}
```







```
print ( )
```



```
printf( )
```



```
printf( hello, world )
```



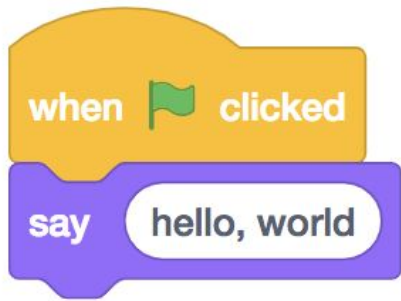

```
printf("hello, world")
```



```
printf("hello, world");
```







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



```
#include <stdio.h>

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

CS50 Sandbox

sandbox.cs50.io

cd

ls

mkdir

rm

rmdir

...

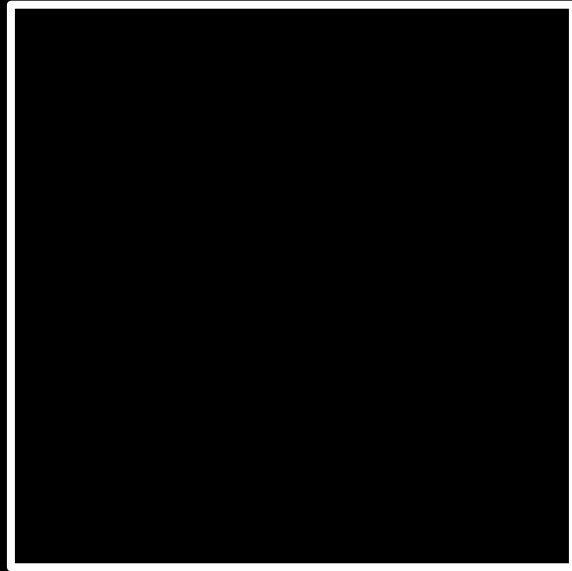

```
#include <stdio.h>

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

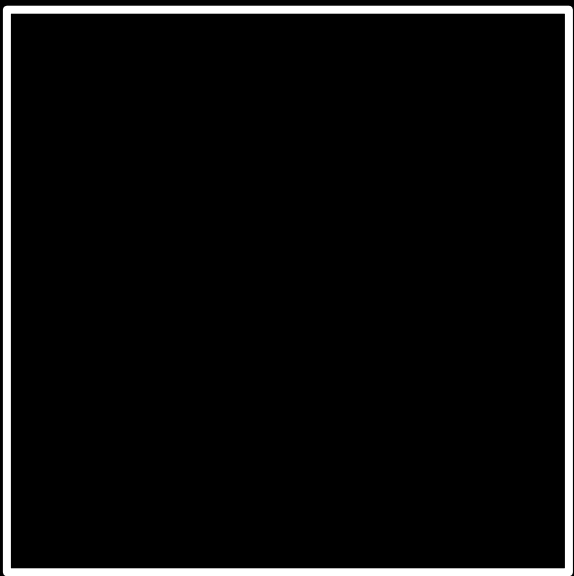
01111111	01000101	01001100	01000110	00000010	00000001	00000001	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000010	00000000	00111110	00000000	00000001	00000000	00000000	00000000
10110000	00000101	01000000	00000000	00000000	00000000	00000000	00000000
01000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
11010000	00010011	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	01000000	00000000	00111000	00000000
00001001	00000000	01000000	00000000	00100100	00000000	00100001	00000000
00000110	00000000	00000000	00000000	00000101	00000000	00000000	00000000
01000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
01000000	00000000	01000000	00000000	00000000	00000000	00000000	00000000
01000000	00000000	01000000	00000000	00000000	00000000	00000000	00000000
11111000	00000001	00000000	00000000	00000000	00000000	00000000	00000000
11111000	00000001	00000000	00000000	00000000	00000000	00000000	00000000
00001000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000011	00000000	00000000	00000000	00000100	00000000	00000000	00000000
00111000	00000010	00000000	00000000	00000000	00000000	00000000	00000000

...

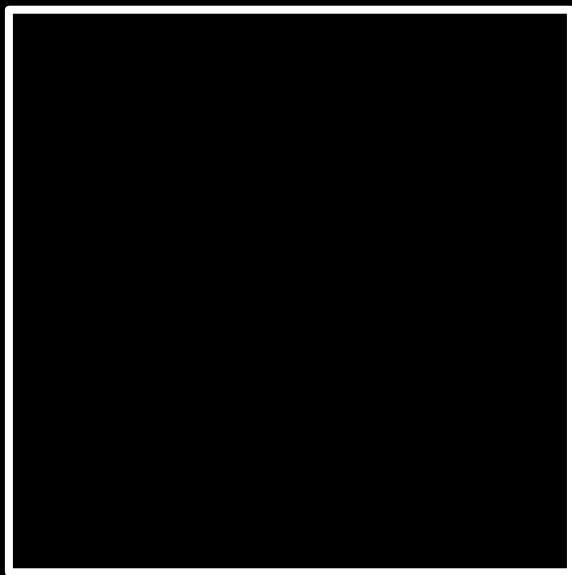
input →



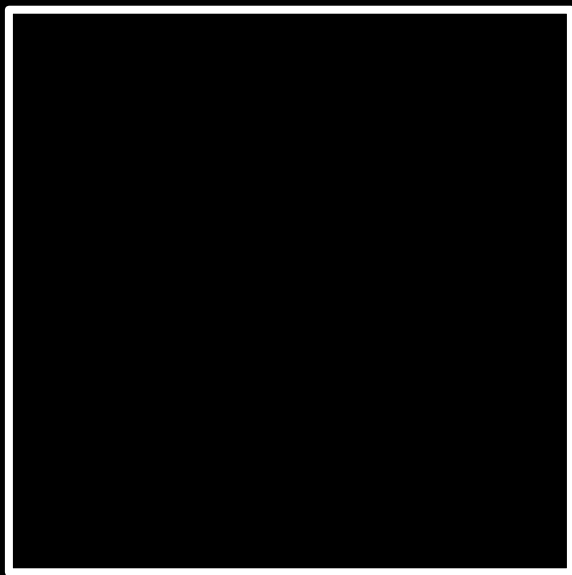
→ output



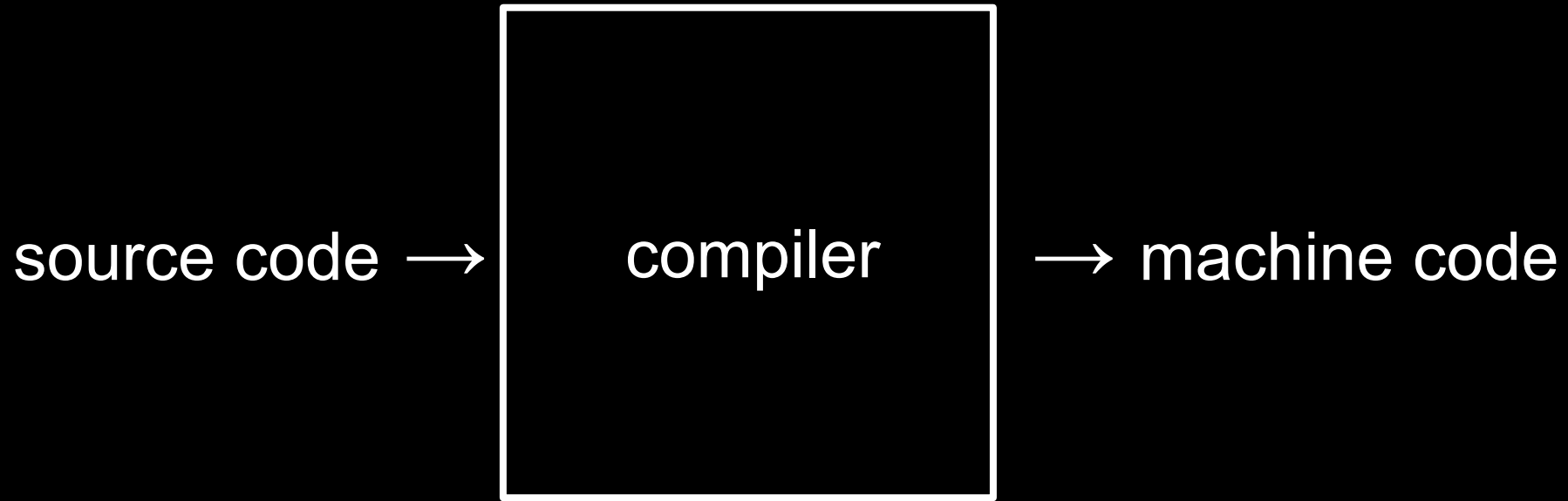
source code →



source code →



→ machine code



```
#include <stdio.h>

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



```
#include <stdio.h>

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

```
clang hello.c
```

```
./a.out
```

```
clang -o hello hello.c
```

```
./hello
```



ask What's your name? and wait

say join hello, answer



```
get_string( )
```



```
get_string("What's your name?\n")
```



```
answer = get_string("What's your name?\n")
```




```
string answer = get_string("What's your name?\n")
```



```
string answer = get_string("What's your name?\n");
```



```
string answer = get_string("What's your name?\n");  
printf(                );
```



```
string answer = get_string("What's your name?\n");  
printf("hello, %s\n", answer);
```



```
string answer = get_string("What's your name?\n");  
printf("hello, %s\n", answer);
```

```
clang -o hello hello.c -lcs50
```

```
./hello
```

```
make hello
```

```
./hello
```







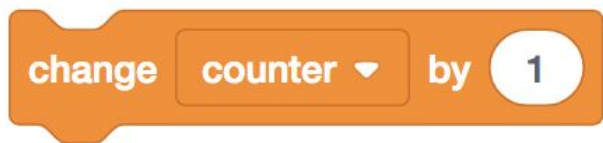
```
counter = 0
```

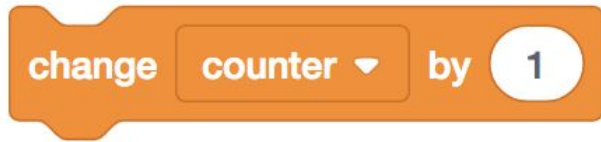


```
int counter = 0
```



```
int counter = 0;
```





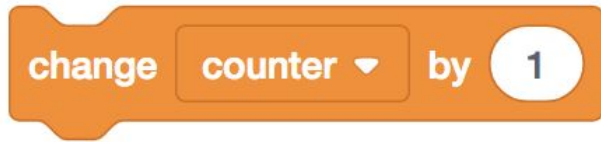
```
counter = counter + 1
```



```
counter = counter + 1;
```



```
counter += 1;
```

```
counter++;
```







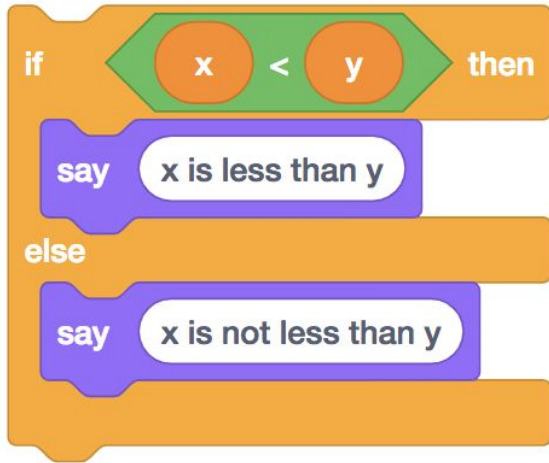
```
if (x < y)
{
}
```



```
if (x < y)
{
    printf("x is less than y\n");
}
```





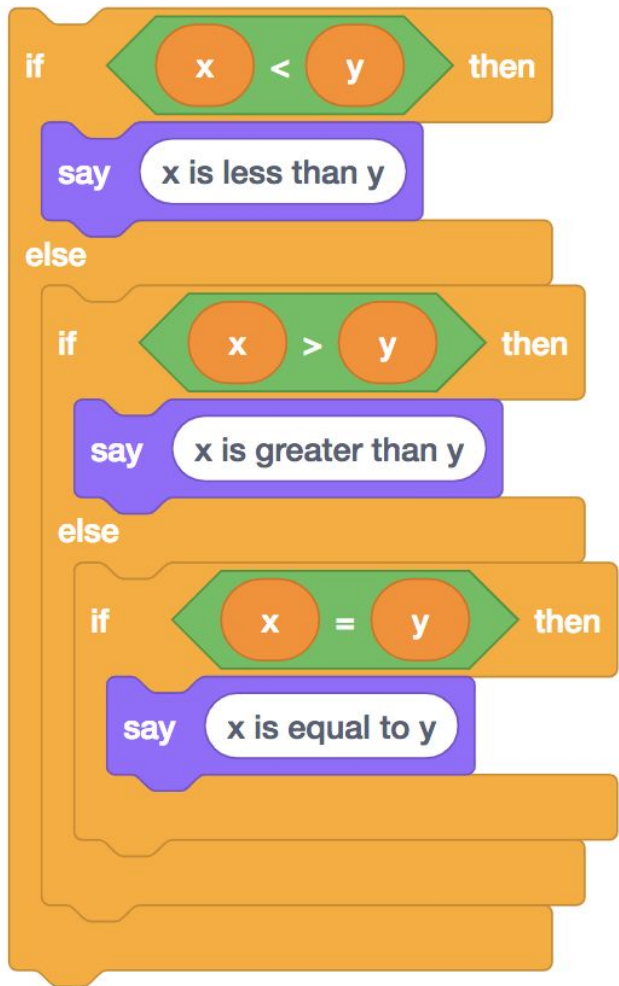


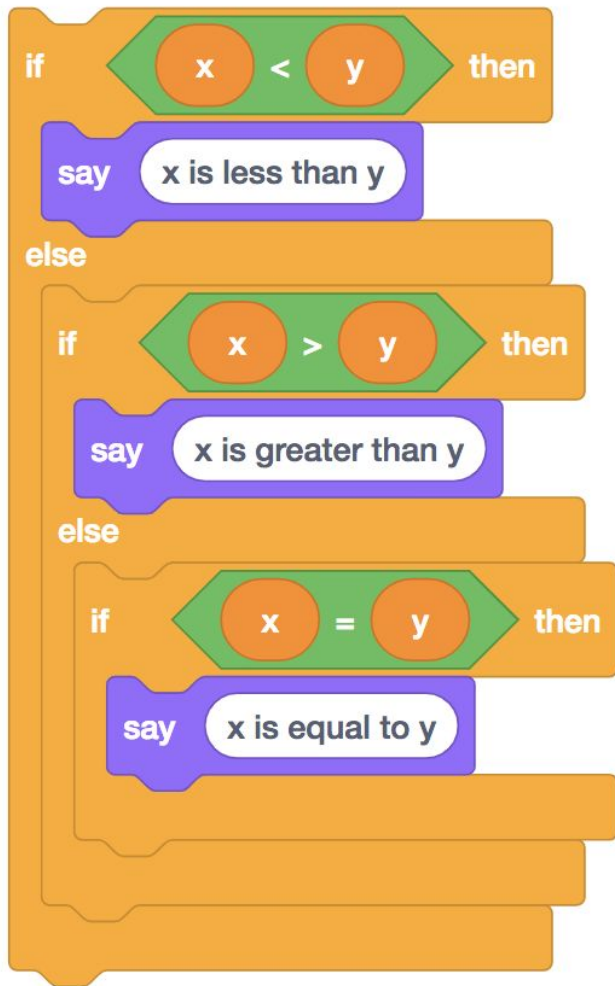
```
if (x < y)
{
}
else
{
}
```



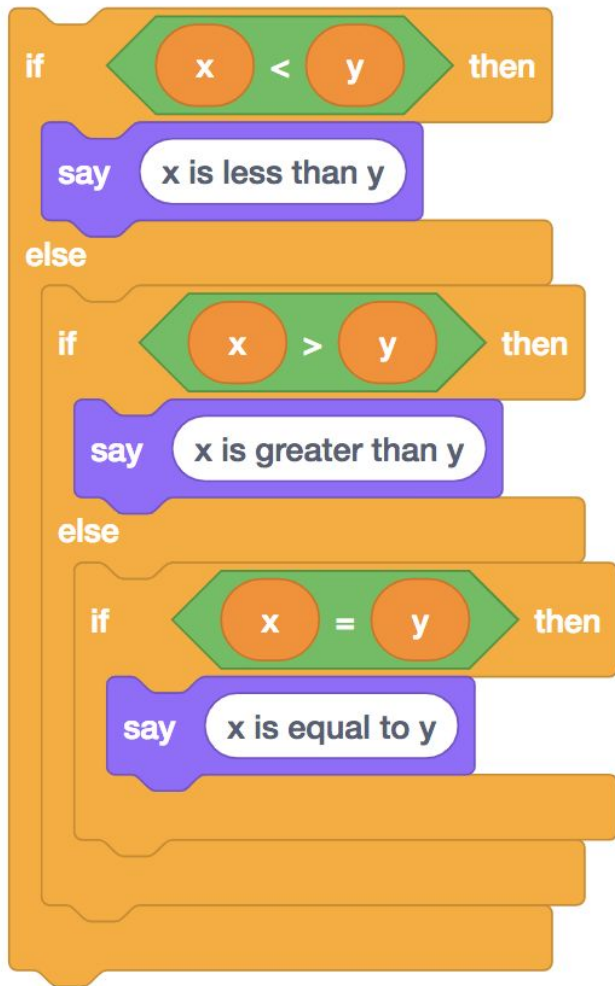

```
if (x < y)
{
    printf("x is less than y\n");
}
else
{
    printf("x is not less than y\n");
}
```



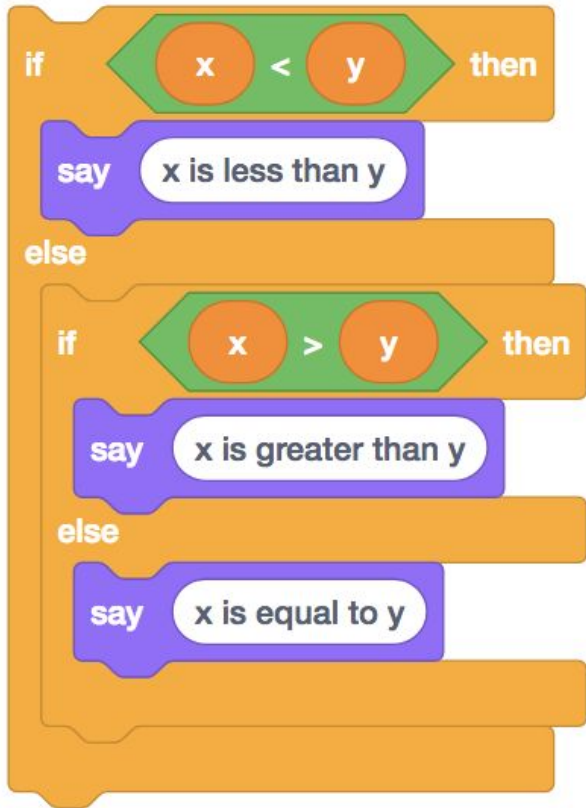




```
if (x < y)
{
}
else if (x > y)
{
}
else if (x == y)
{
}
```

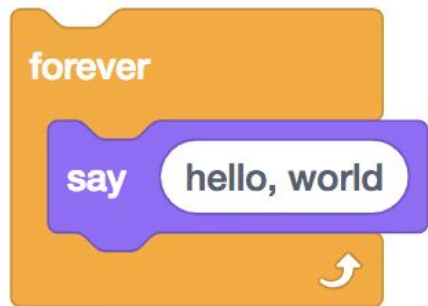


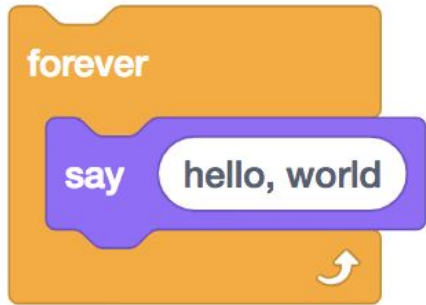
```
if (x < y)
{
    printf("x is less than y\n");
}
else if (x > y)
{
    printf("x is greater than y\n");
}
else if (x == y)
{
    printf("x is equal to y\n");
}
```



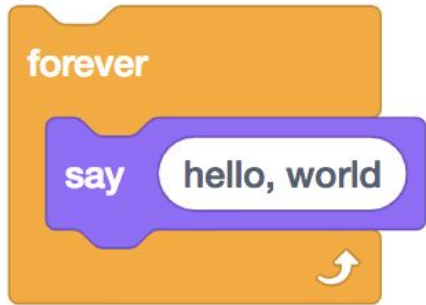
```
if (x < y)
{
    printf("x is less than y\n");
}
else if (x > y)
{
    printf("x is greater than y\n");
}
else
{
    printf("x is equal to y\n");
}
```



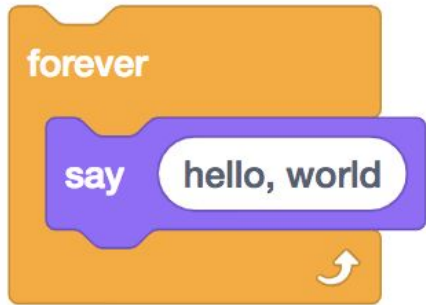




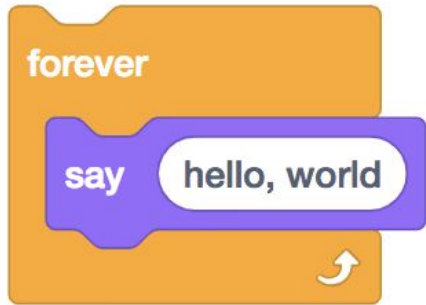
```
while  
{  
  
}  
}
```



```
while  
{  
    printf("hello, world\n");  
}
```



```
while ( )  
{  
    printf("hello, world\n");  
}
```



```
while (true)
{
    printf("hello, world\n");
}
```







```
int counter = 0;
```



```
int i = 0;
```




```
int i = 0;  
while ( )  
{  
  
}
```



```
int i = 0;  
while (i < 50)  
{  
  
}  
}
```



```
int i = 0;
while (i < 50)
{
    printf("hello, world\n");
}
```



```
int i = 0;
while (i < 50)
{
    printf("hello, world\n");
    i = i + 1;
}
```



```
int i = 0;
while (i < 50)
{
    printf("hello, world\n");
    i += 1;
}
```



```
int i = 0;
while (i < 50)
{
    printf("hello, world\n");
    i++;
}
```



```
int i = 50;
while (i > 0)
{
    printf("hello, world\n");
    i--;
}
```





```
for  
{  
  
}  
}
```



```
for  
{  
    printf("hello, world\n");  
}
```



```
for ( )  
{  
    printf("hello, world\n");  
}
```



```
for (int counter = 0;           )  
{  
    printf("hello, world\n");  
}
```



```
for (int i = 0;           )  
{  
    printf("hello, world\n");  
}
```



```
for (int i = 0; i < 50;      )  
{  
    printf("hello, world\n");  
}
```



```
for (int i = 0; i < 50; i = i + 1)
{
    printf("hello, world\n");
}
```



```
for (int i = 0; i < 50; i += 1)
{
    printf("hello, world\n");
}
```




```
for (int i = 0; i < 50; i++)  
{  
    printf("hello, world\n");  
}
```

bool

char

double

float

int

long

string

...

get_char

get_double

get_float

get_int

get_long

get_string

...

%c

%f

%i

%li

%s

`%c` char

`%f` float, double

`%i` int

`%li` long

`%s` string

+

-

*

/

%

+ addition

- subtraction

* multiplication

/ division

% remainder

manual pages

MARIO
000000

● × 00

WORLD
1-1

TIME

SUPER MARIO BROS.

©1985 NINTENDO

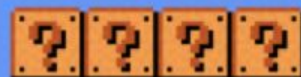


1 PLAYER GAME

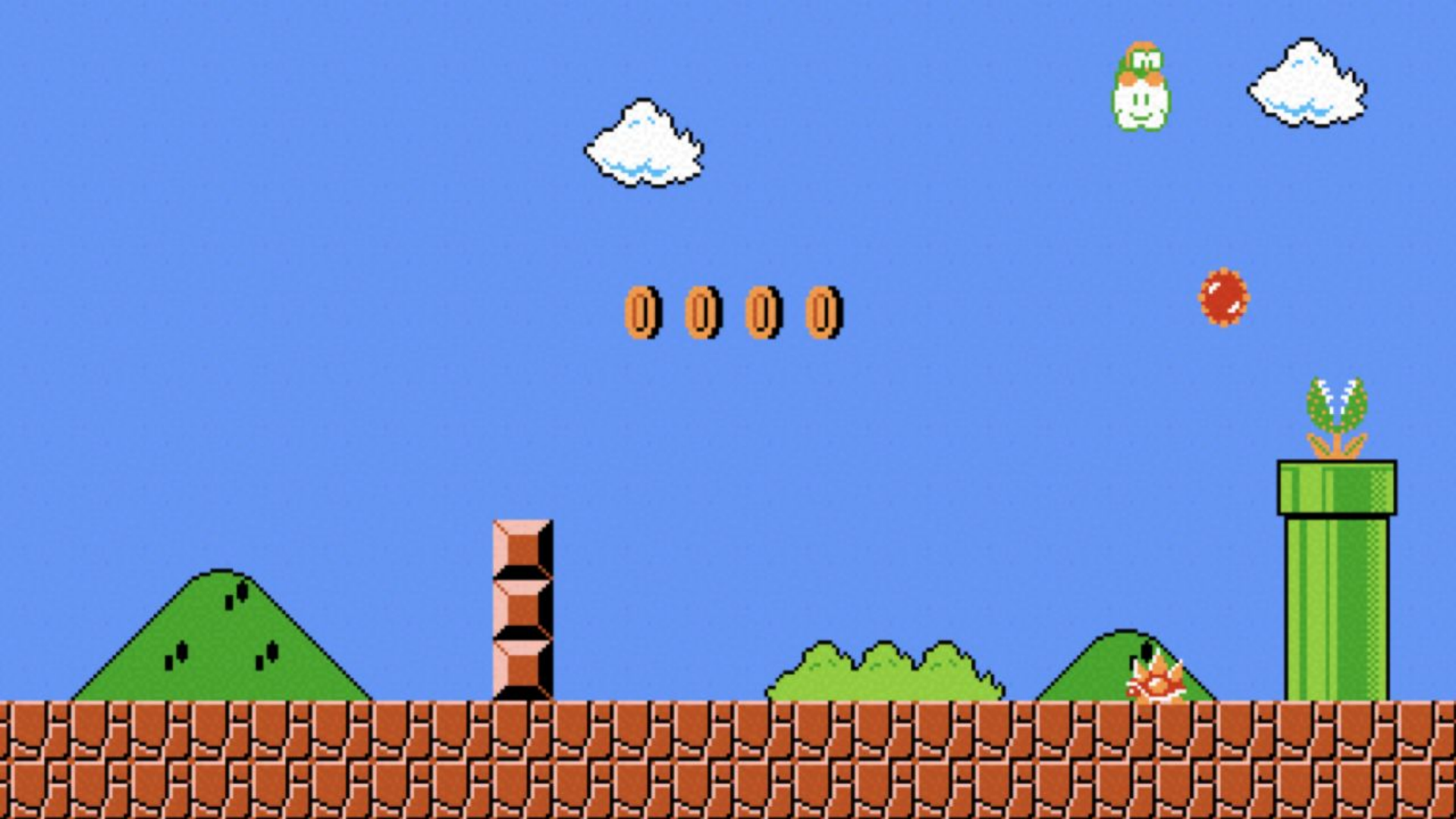
2 PLAYER GAME

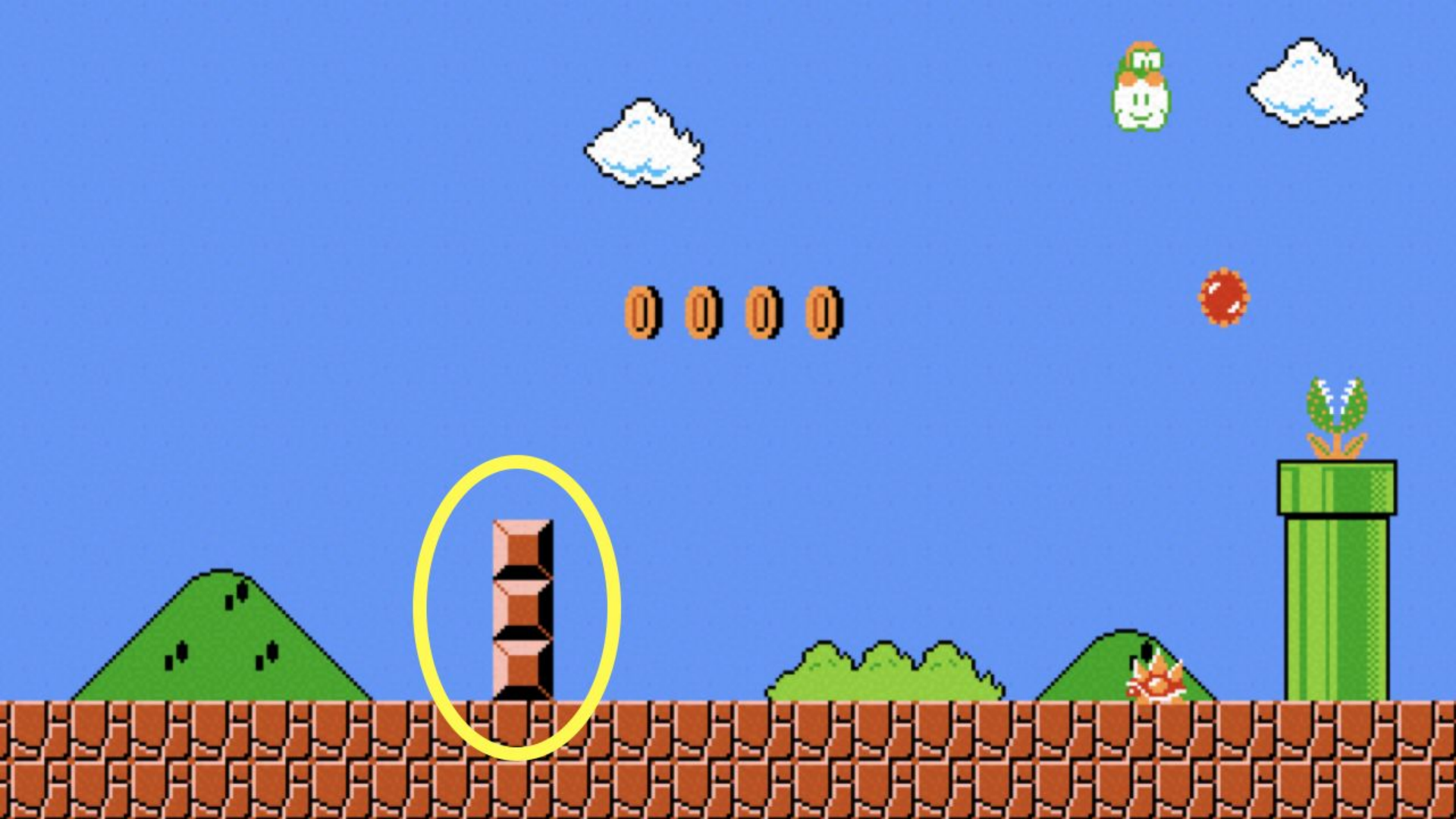
TOP- 000000

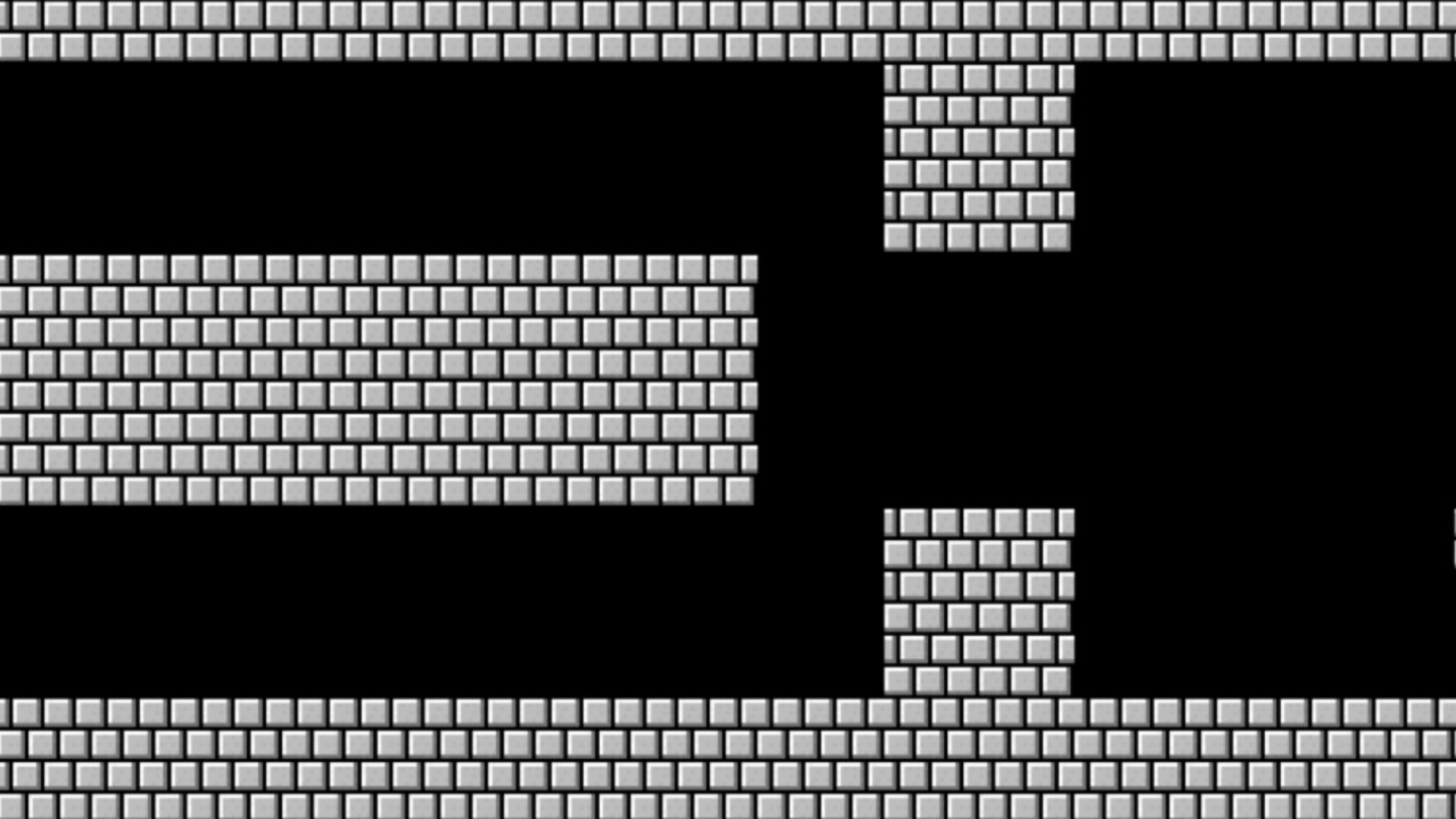


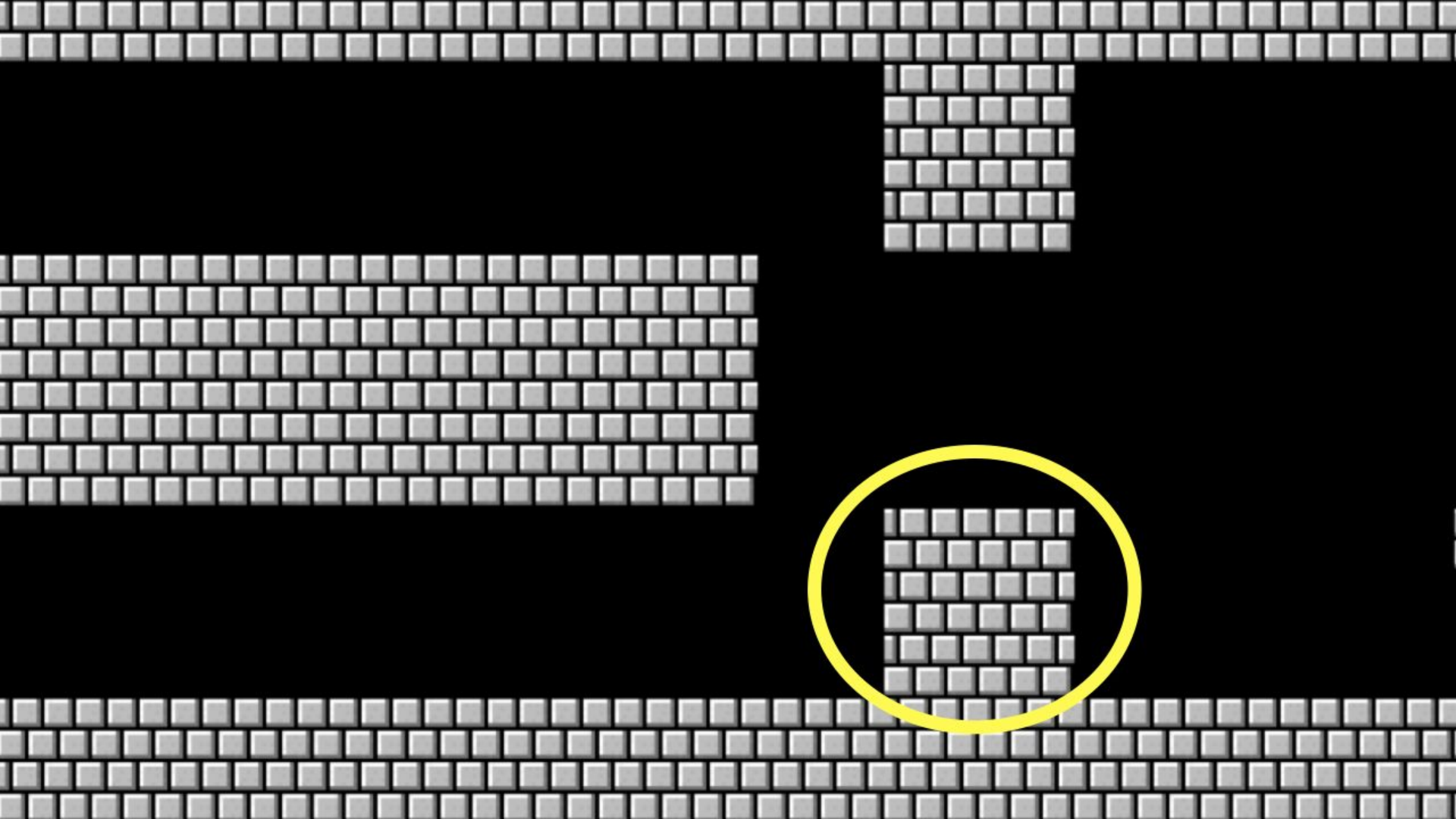












CS50 Lab

lab.cs50.io



floating-point imprecision

integer overflow

123

124

125

126

127

128

129

1

120

130

999

1

990

1

900

111

1

110

1

100

1

000

000

integer overflow

1999

1999

1900



This is CS50