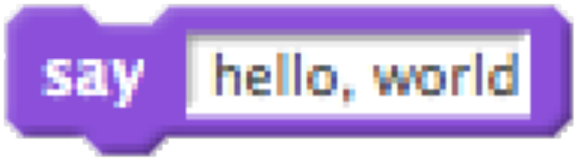
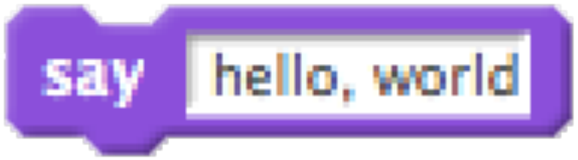
CS50

C


when clicked
say hello, world


say
hello, world




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


```c
#include <stdio.h>

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


forever
say
hello, world


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


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


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


repeat
50
say
hello, world


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


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


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


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


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


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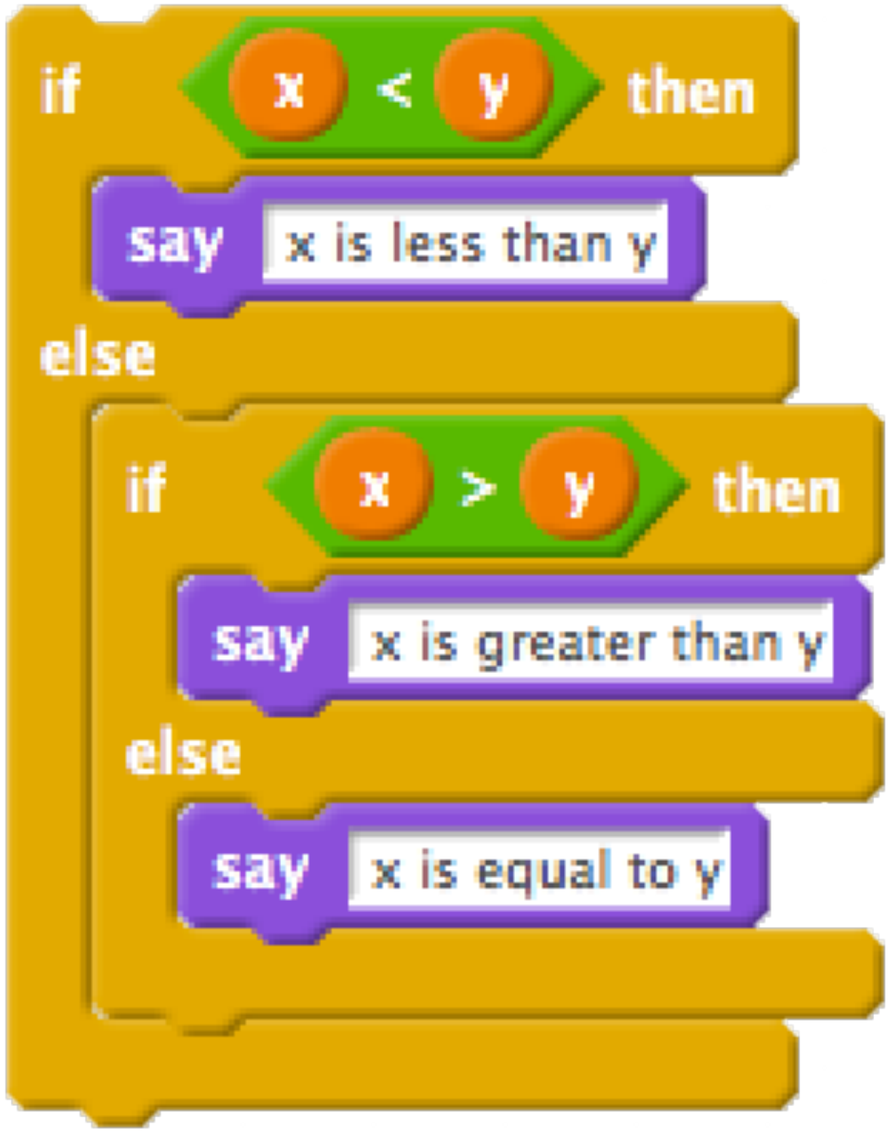
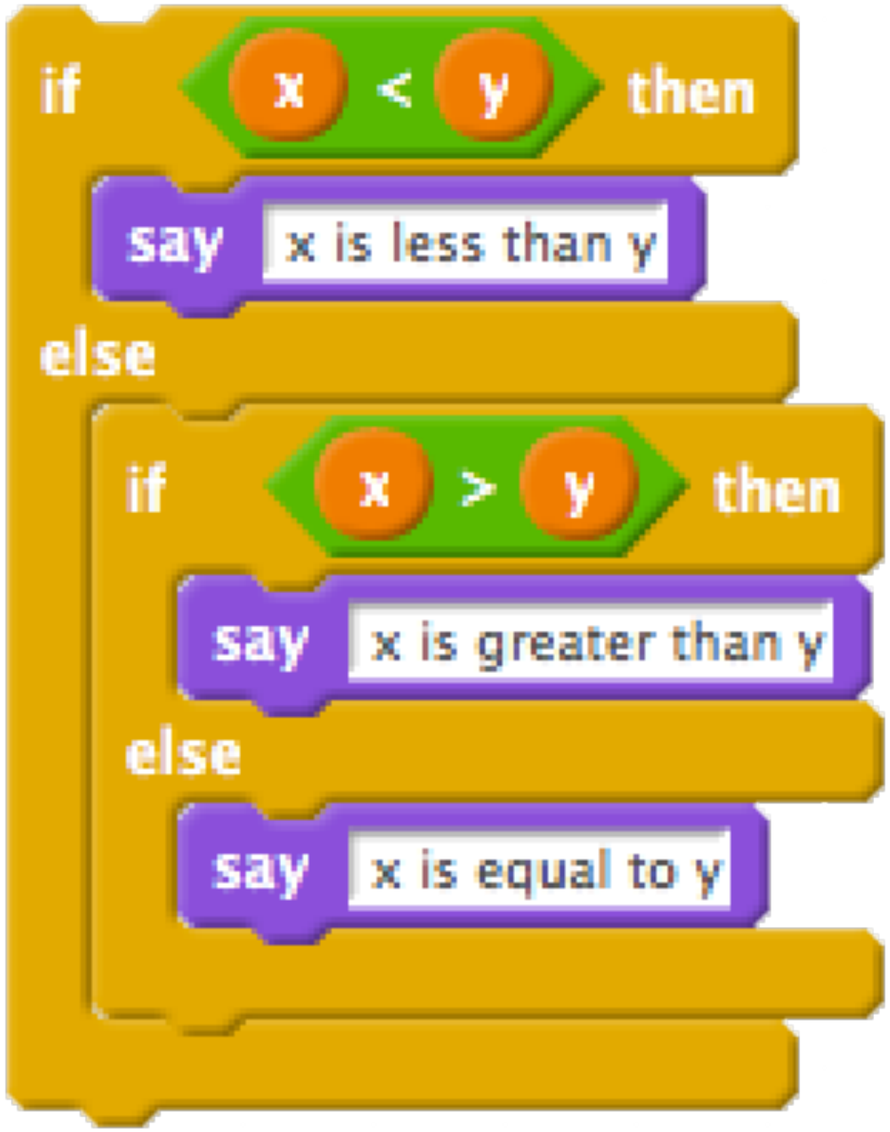
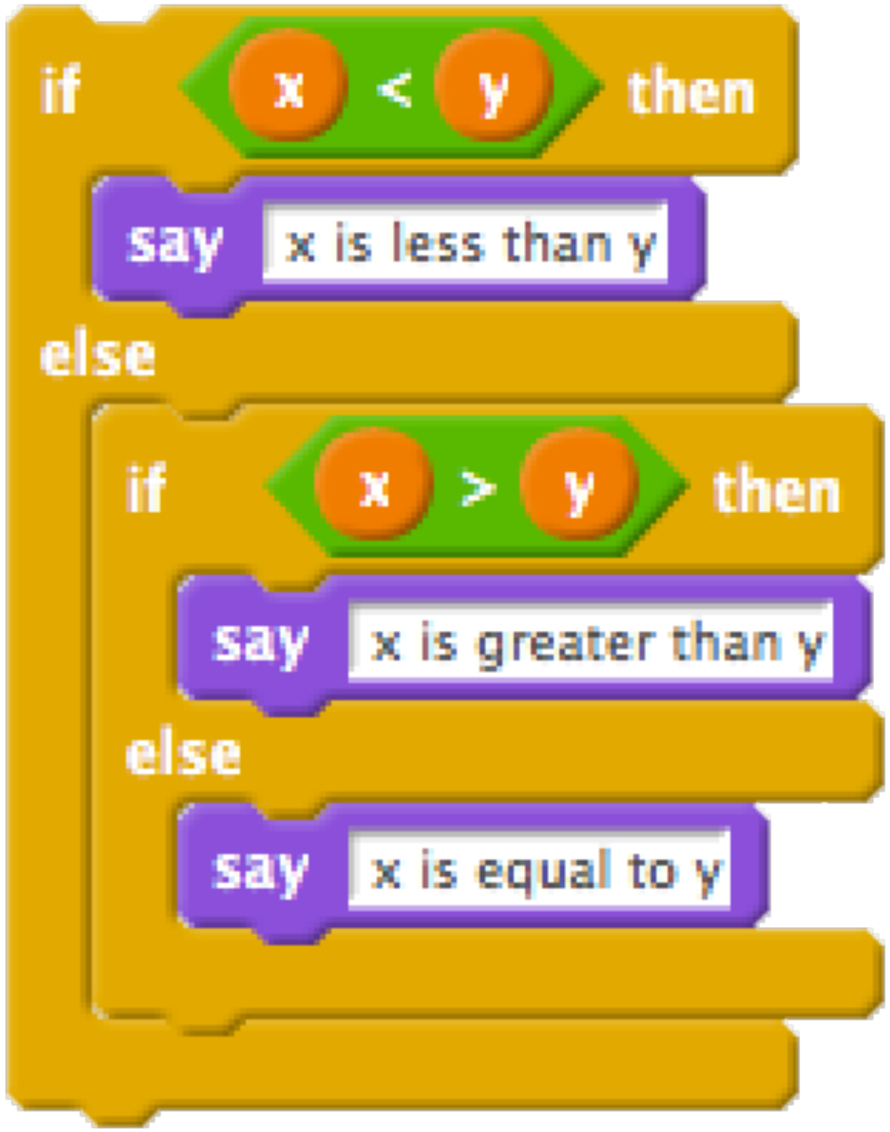
```c
for (int i = 0; i < 50; i++)
{
    printf("hello, world\n");
}
```


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


if x < y then
say x is less than y
else
if x > y then
say x is greater than y
else
say x is equal to y




```
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");
}
```

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}
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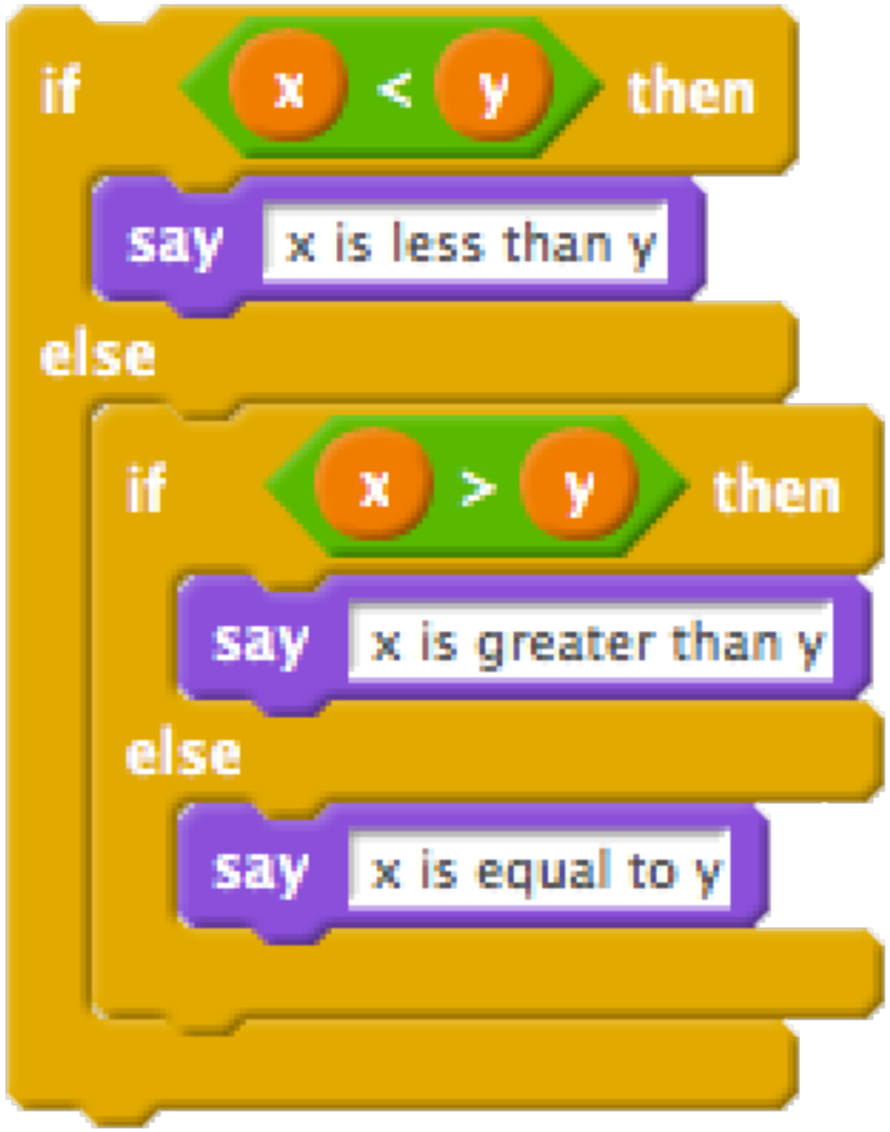
}
```

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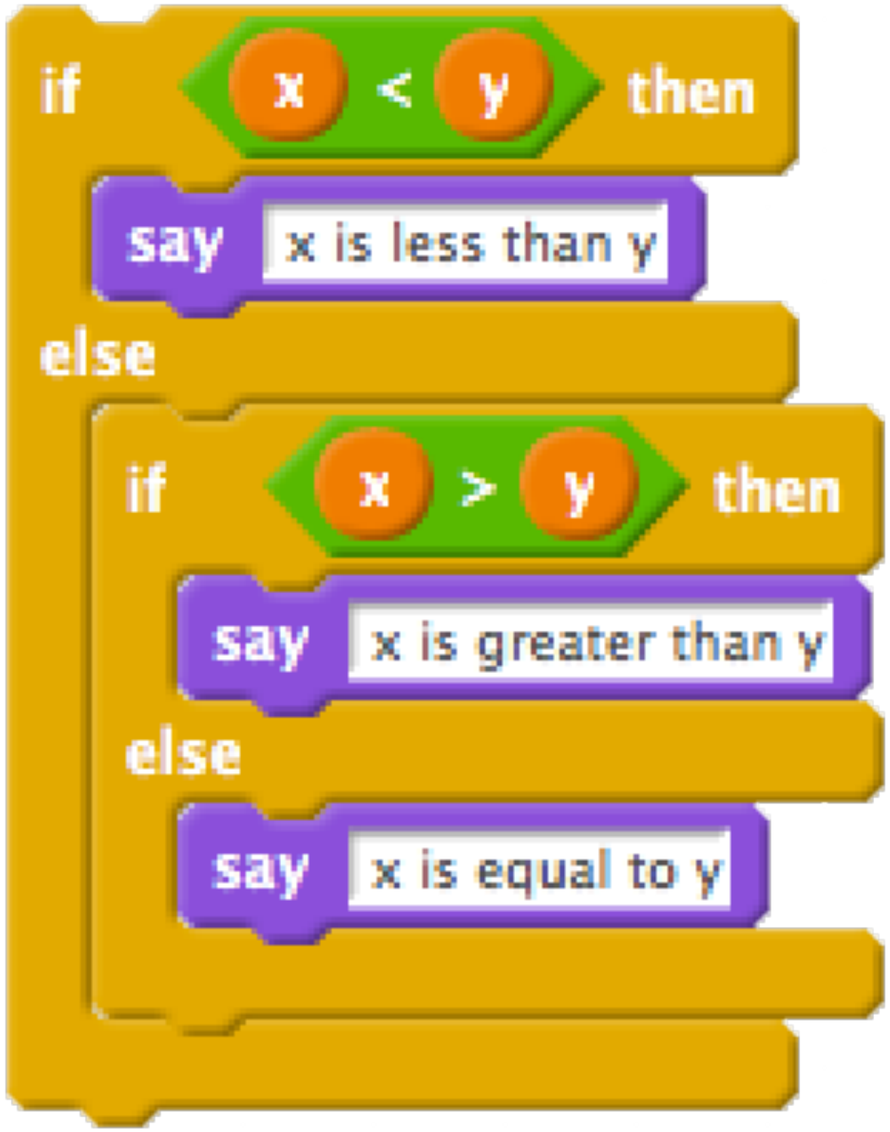


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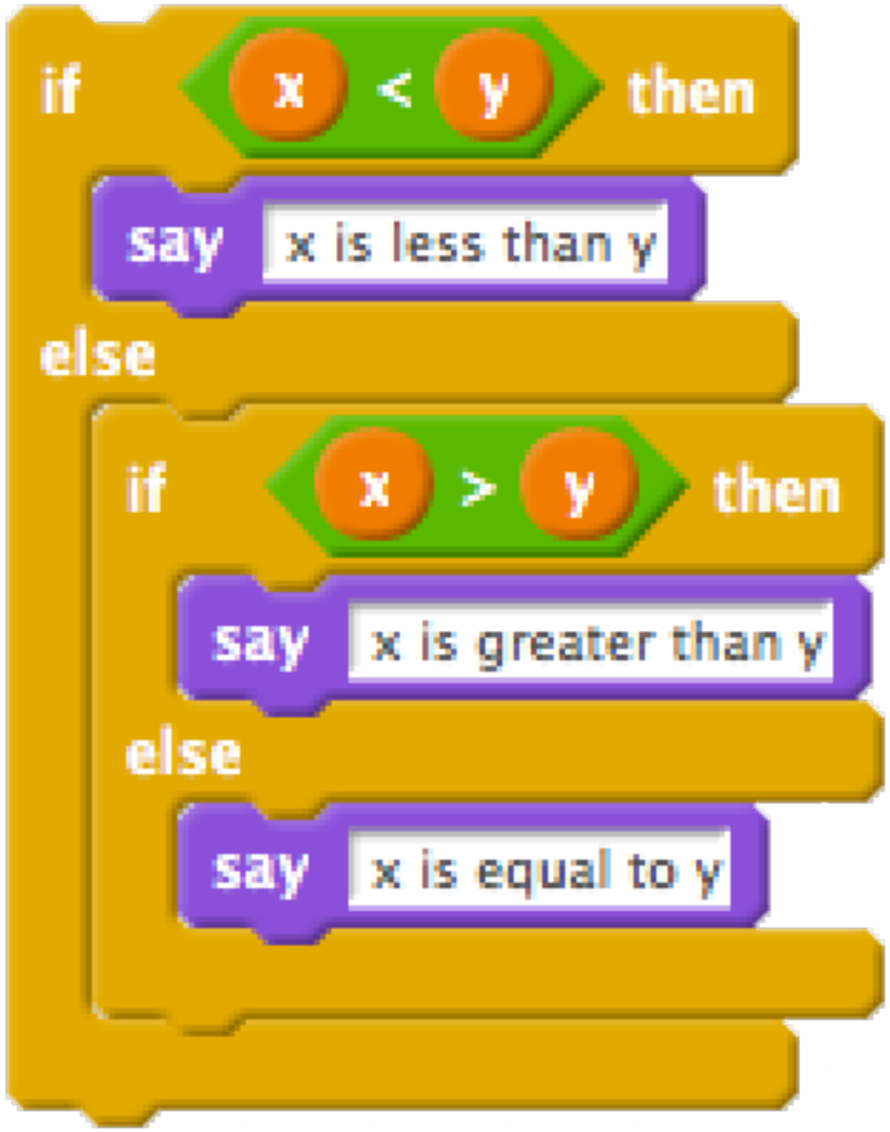


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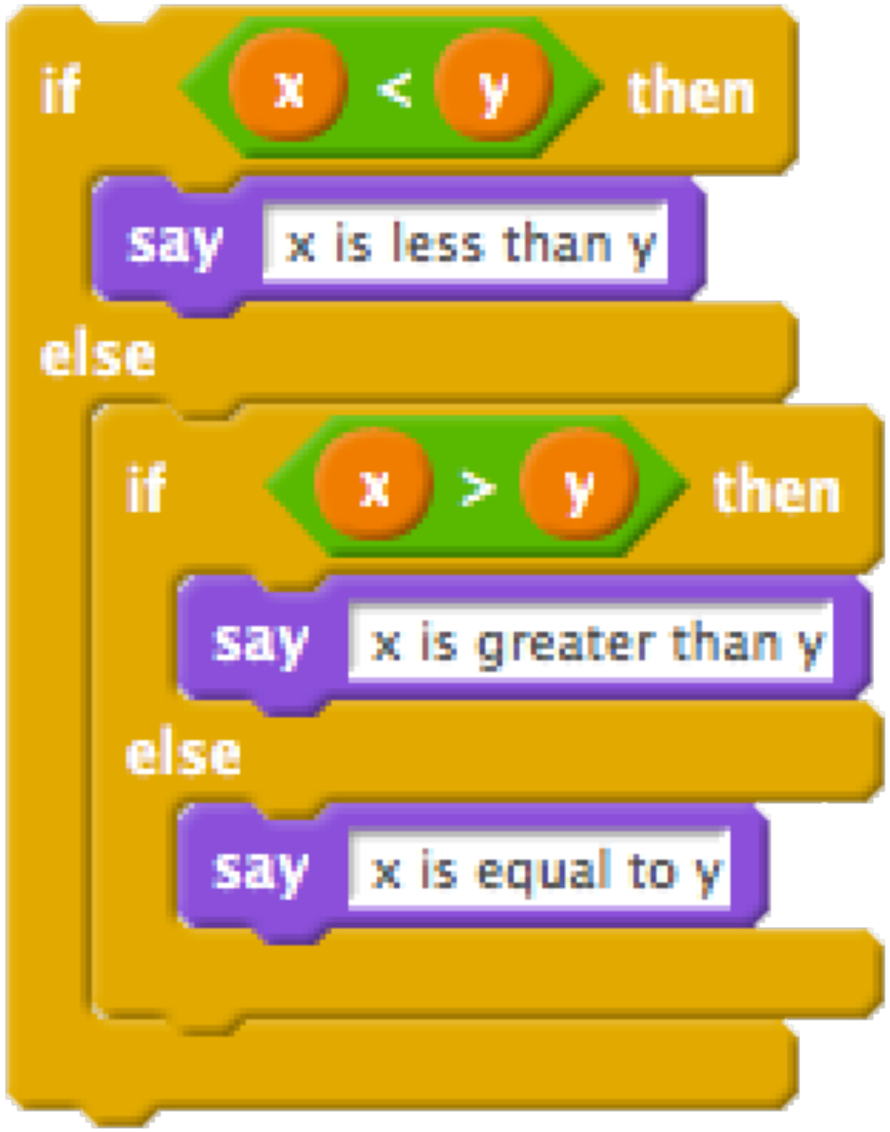


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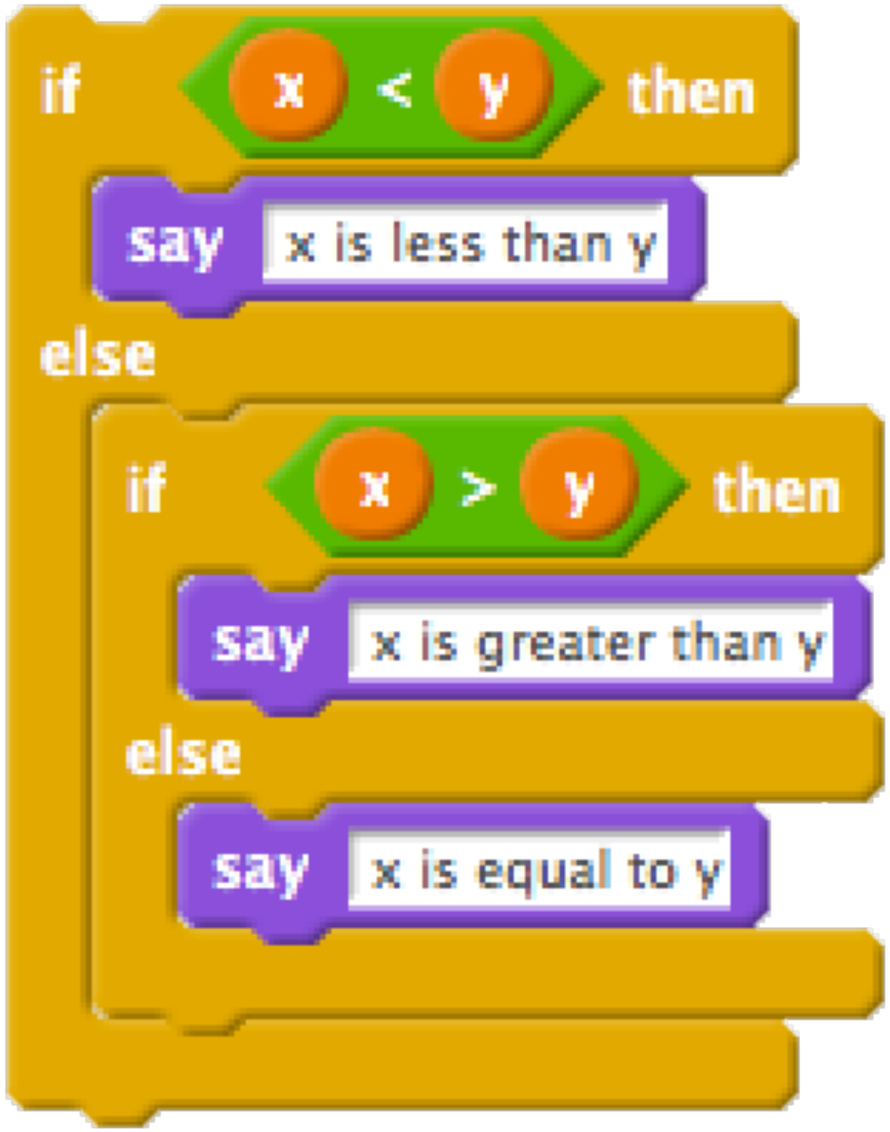


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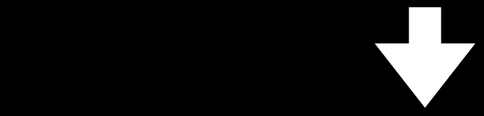
```c
#include <stdio.h>

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

```
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
00111000 00000010 01000000 00000000 00000000 00000000 00000000 00000000
00111000 00000010 01000000 00000000 00000000 00000000 00000000 00000000
00011100 00000000 00000000 00000000 00000000 00000000 00000000 00000000
...
```

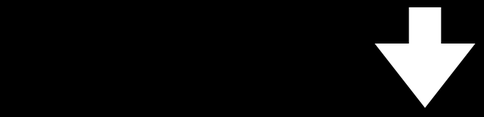
source code

machine code

source code



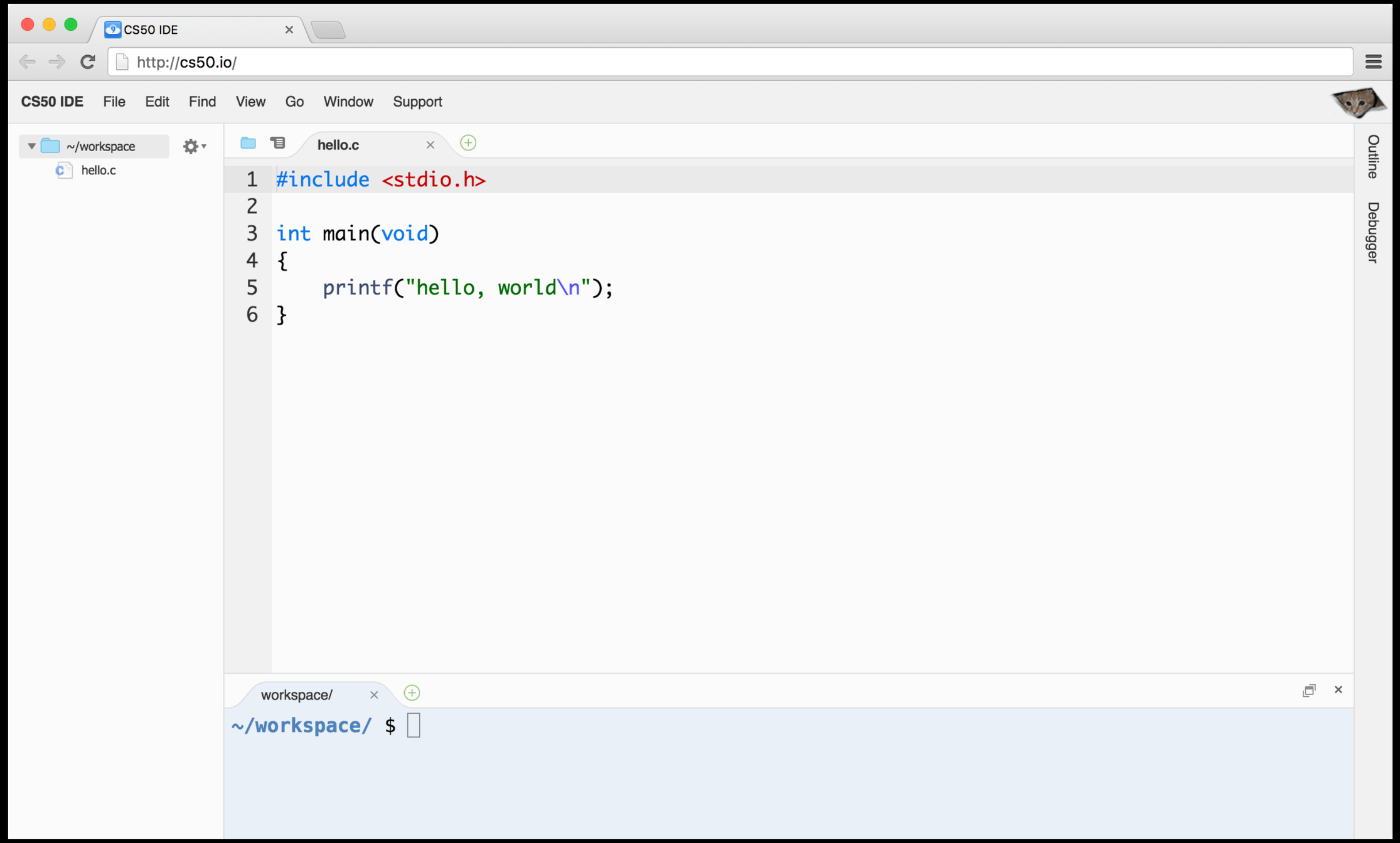
compiler

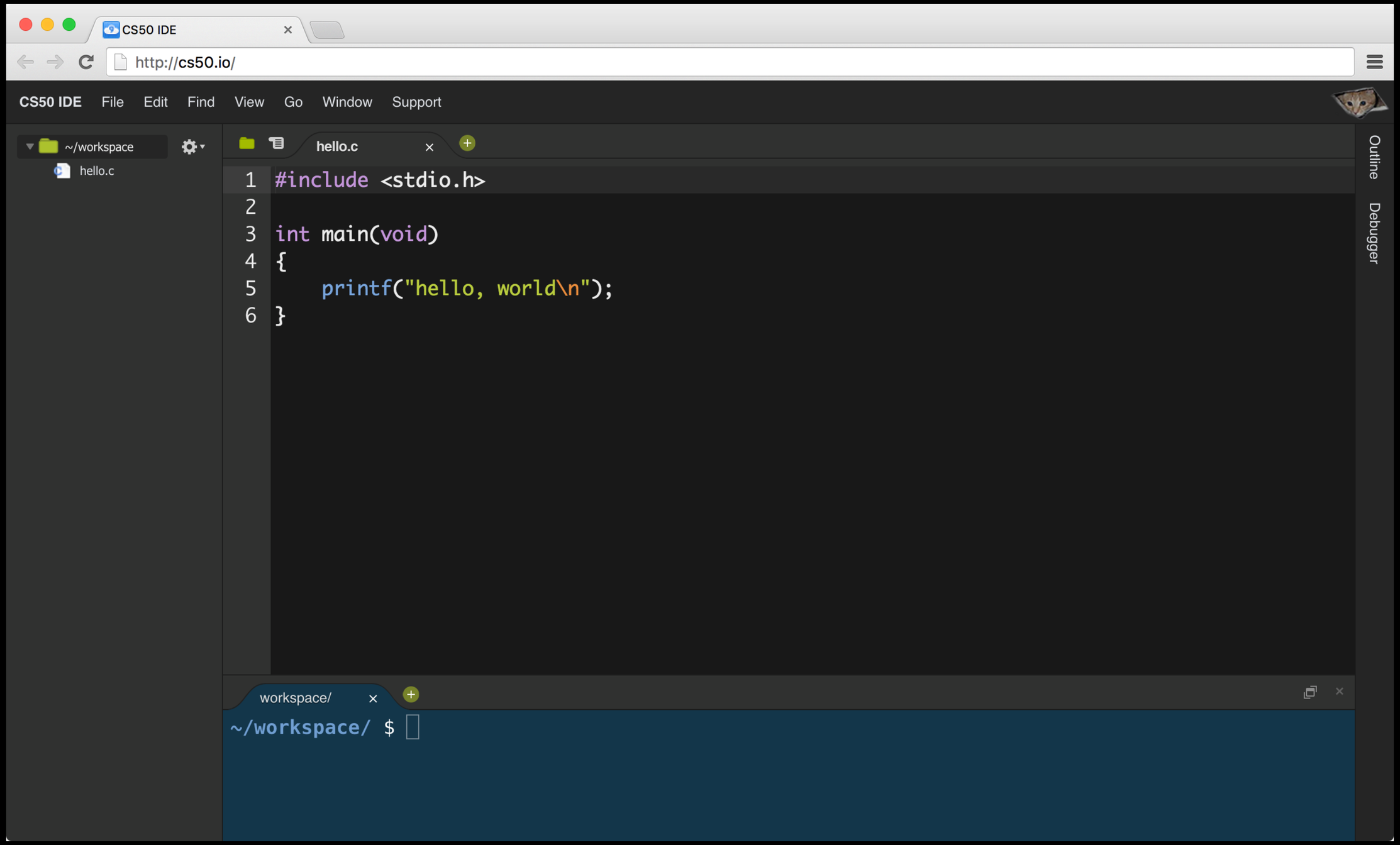


machine code

CS50 IDE

cs50.io


CS50 IDE
http://cs50.io/
CS50 IDE File Edit Find View Go Window Support
~/workspace
hello.c
hello.c
1 #include <stdio.h>
2
3 int main(void)
4 {
5 printf("hello, world\n");
6 }
Outline
Debugger
workspace/
~/workspace/ $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1 #include <stdio.h>
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6 }
Outline
Debugger
workspace/
~/workspace/ $

```
clang hello.c

./a.out
```

```
clang -o hello hello.c

./hello
```

```
make hello

./hello
```

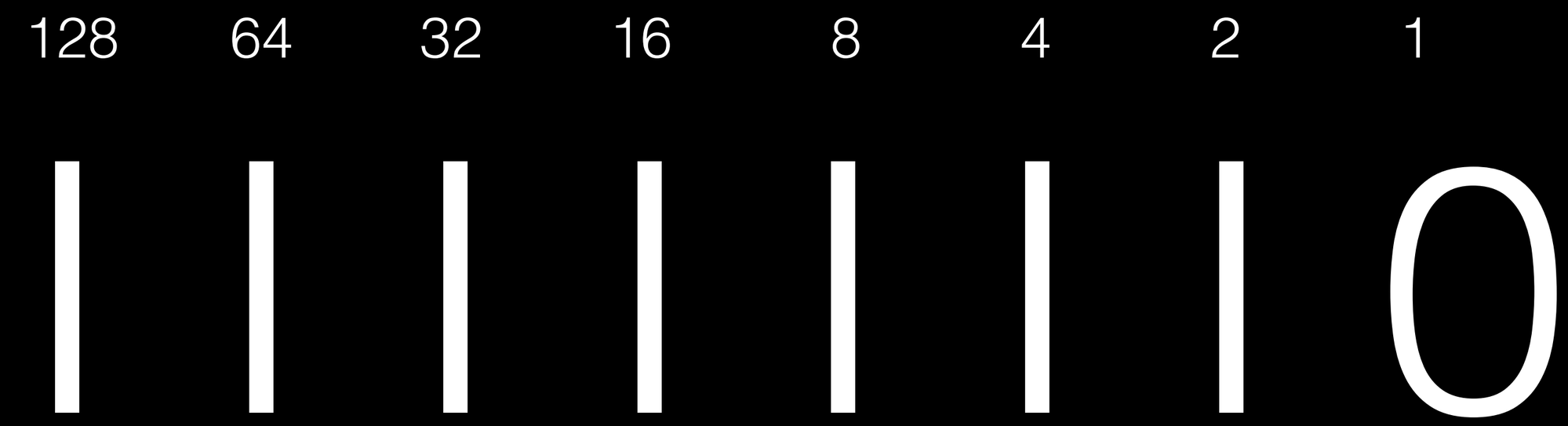
```
cd

ls

mkdir

rm

rmdir

...
```

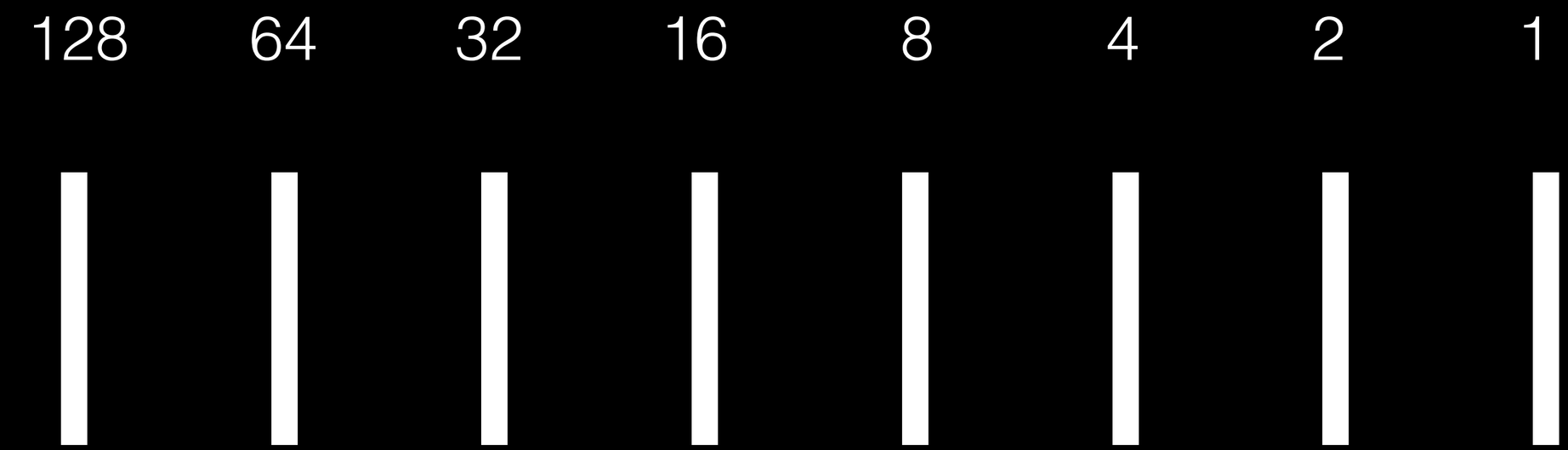
```
get_char

get_double

get_float

get_int

get_long_long

get_string

...
```

```
bool

char

double

float

int

long long

string

...
```


crucial
by Micron
8BB12
D6HXT
8BB12
D9HXT
4G85
4G85
4G85
47J6

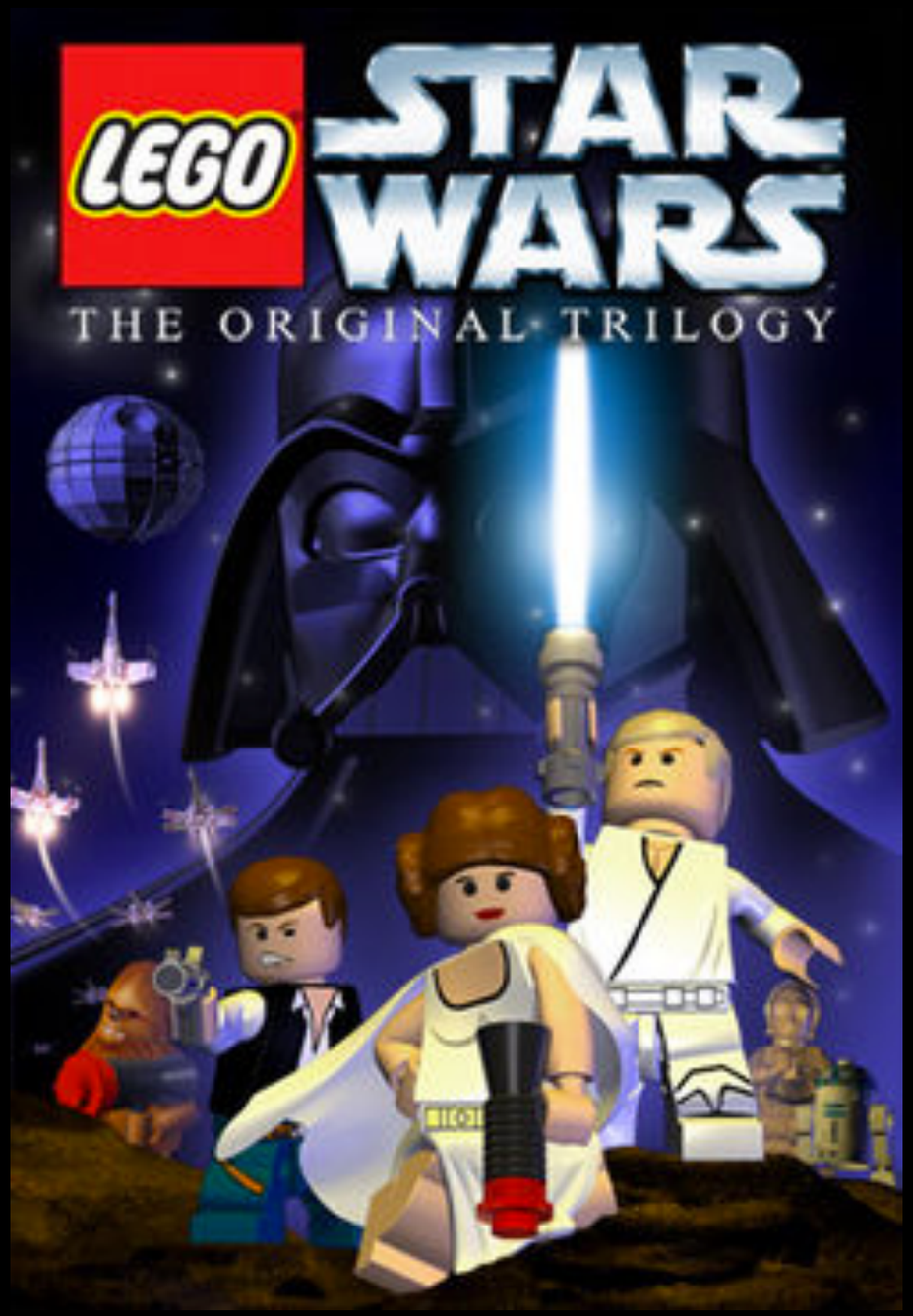
integer overflow


128
64
32
16
8
4
2
1
0


128
64
32
16
8
4
2
1

128 64 32 16 8 4 2 1

00000000




B
4,000,000,000

floating-point imprecision

integer overflow


Greetings from M.Gandhi, ruler
and King of the Indians...
Our words are backed
with NUCLEAR WEAPONS!
kotaku.com

CS50