This is Section.

Week 1: C

Gabe LeBlanc

This is Real. This is Me. 🎵

gleblanc@college.harvard.edu

heads@cs50.harvard.edu

github.com/gblanc25/cs50

Office Hours: Saturdays at 1pm in Cabot Dhall

More help!

asynchronous questions

sundays 3-5pm

immediate response

Grading: Design

5 4 3 2 1

Grading: Design

5 **4** **3** 2 1

Grading: Correctness

check50

Grading: Style

style50

Think.
Pair.
Share.

- Why are we using **C**?
- How can we **read** and **write** code that includes **variables**, **conditionals**, and **loops**?
- Why do we care about **data types**?
- What does it mean to **compile** a C program?

Part 1

Variables and Types

Input and Printing

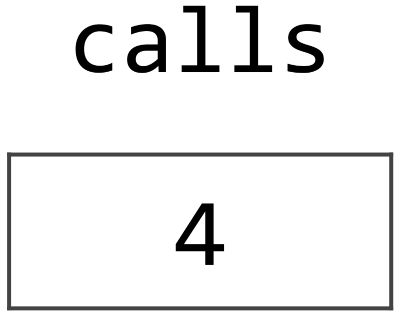
Variables

`calls`

$\boxed{4}$

Variables

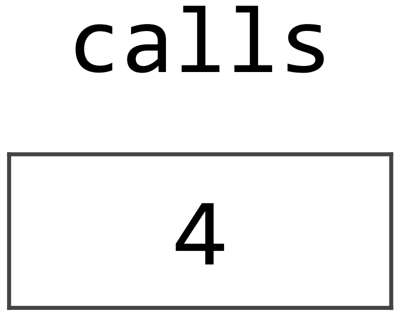
```
int calls = 4;
```



Variables

```
int calls = 4;
```

name



Variables

```
int calls = 4;
```

type

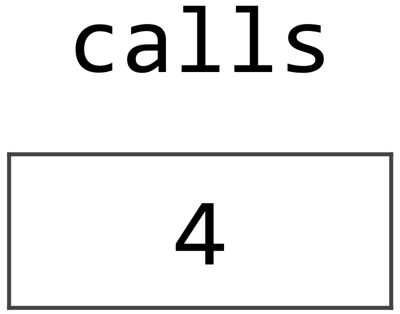
`calls`

$\boxed{4}$

Variables

```
int calls = 4;
```

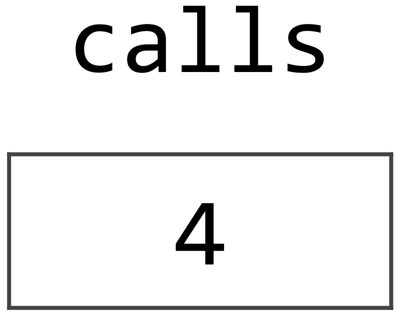
value



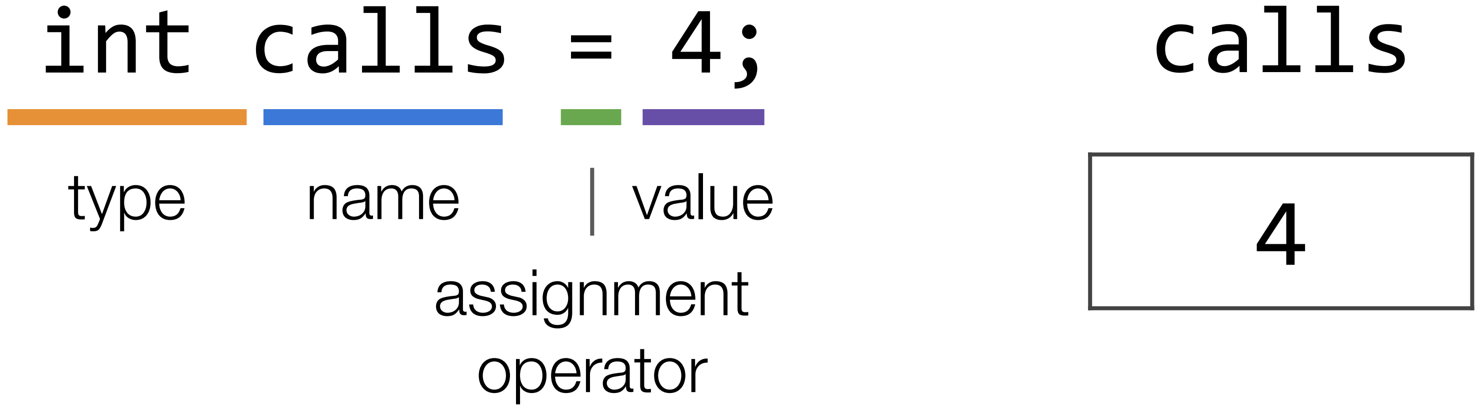
Variables

```
int calls = 4;
```

assignment
operator



Variables

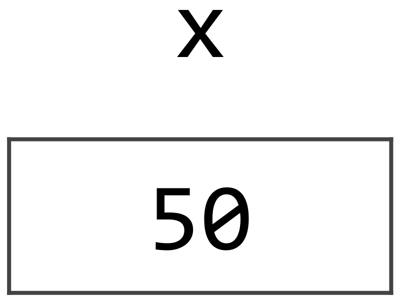


```
int calls = 4;
```

"Create an **integer** named **calls** that **gets** the **value 4**."

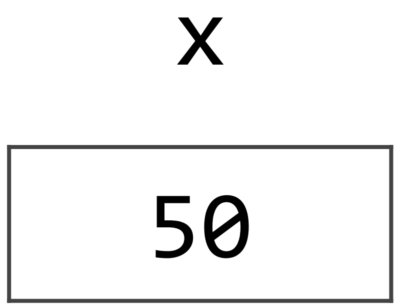
Variables

```
int x = 50;
```



Variables

```
int x = 50;
```



"Create an **integer** named **x** that **gets** the **value 50**."

Think.
Pair.
Share.

Why does C care about data types?

01000001

`int`

65

`01000001`

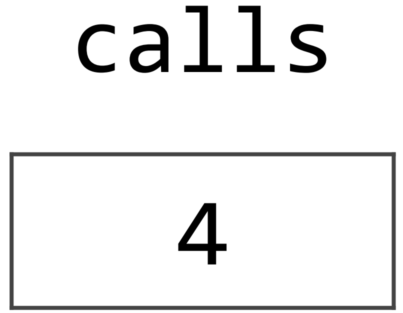
`char`

'A'

`01000001`

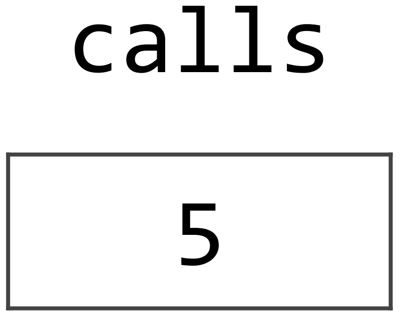
Variables

```
int calls = 4;
calls = 5;
```



Variables

```
int calls = 4;
calls = 5;
```

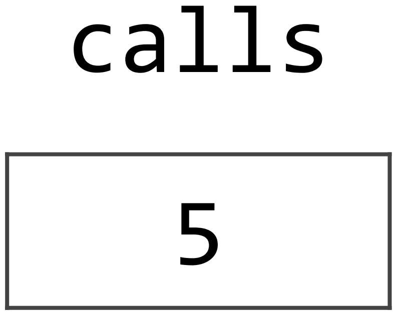


Variables

```
int calls = 4;
calls = 5;
```

name | value

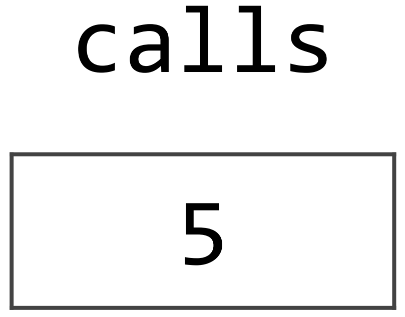
assignment operator



"**Calls gets 5**."

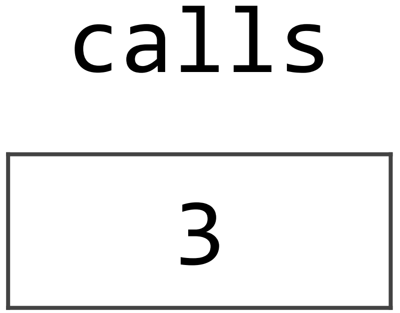
Operators

```
int calls = 4;
calls = calls + 1;
```



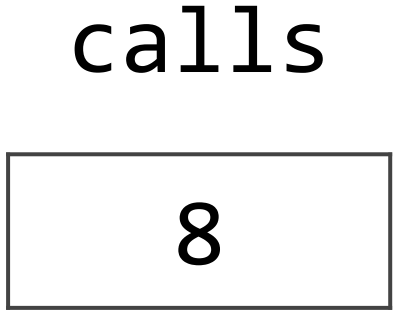
Operators

```
int calls = 4;
calls = calls - 1;
```



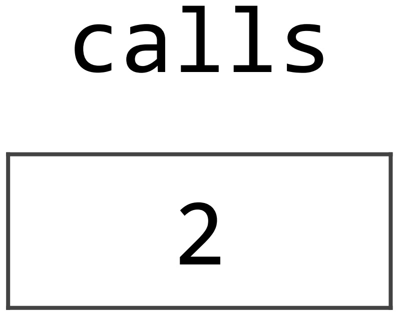
Operators

```
int calls = 4;
calls = calls * 2;
```



Operators

```
int calls = 4;
calls = calls / 2;
```



Operators

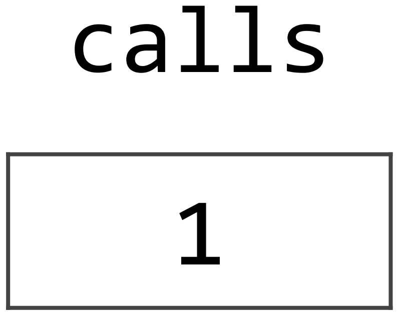
```
int calls = 4;
calls = calls / 3;
```

calls

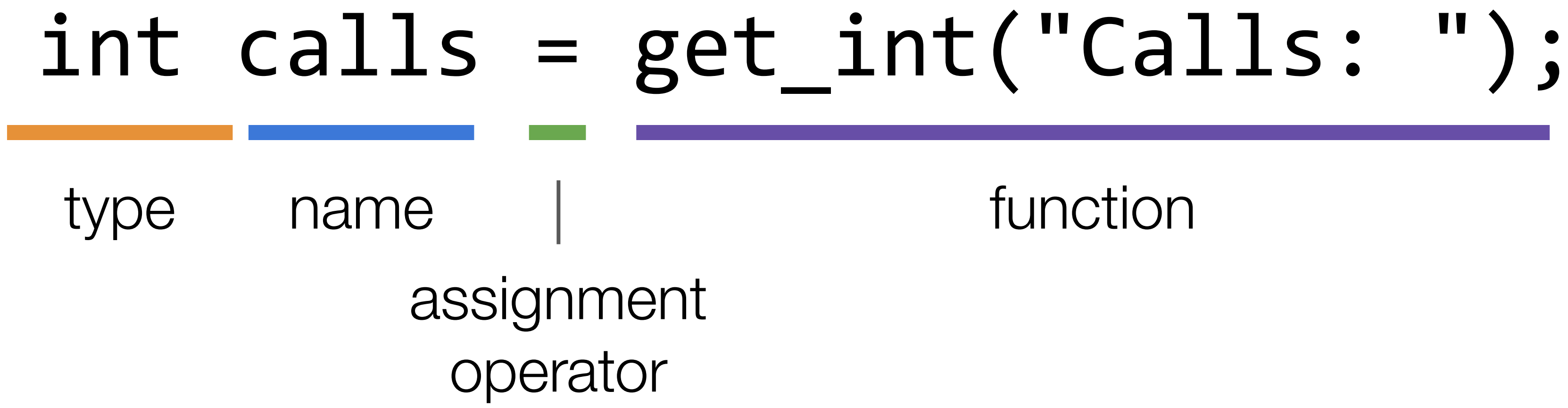
$\boxed{??}$

Operators

```
int calls = 4;
calls = calls / 3;
```



Getting input



```
int calls = get_int("Calls: ");
```

Functions

```
int calls = get_int("Calls: ");
```

$\underbrace{\texttt{get\_int("Calls: ");}}_{\text{function}}$

Functions

```
int calls = get_int("Calls: ");
```

function name

Functions

```
int calls = get_int("Calls: ");
```

function input

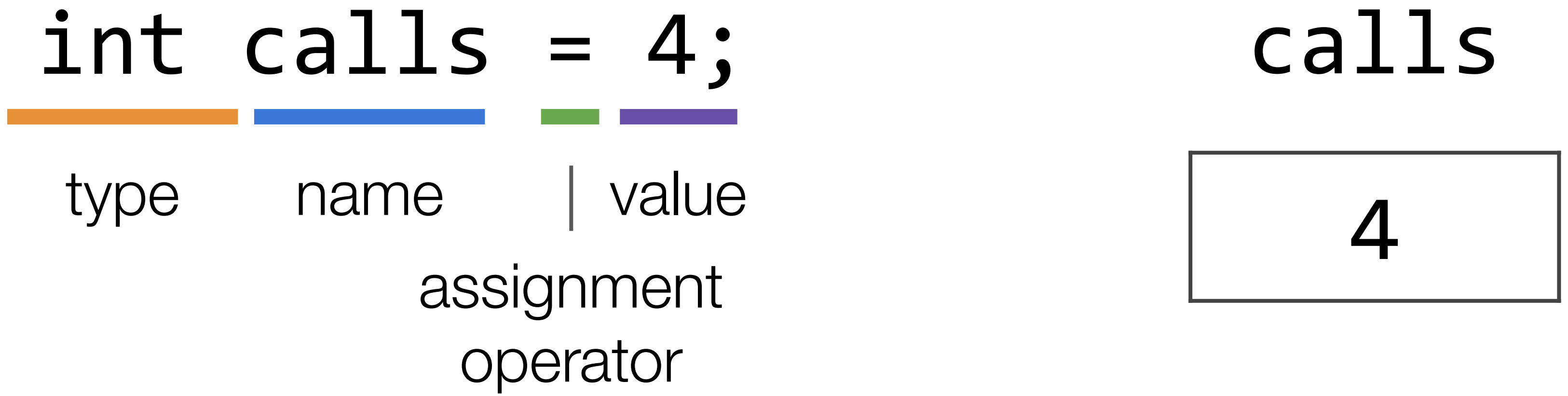
Functions

$\texttt{int calls = }\underbrace{\texttt{get\_int("Calls: ");}}_{\text{function}}$

Return values

$\texttt{int calls = }\underbrace{\texttt{4;}}_{\text{value}}$

Storing return values



```
int calls = 4;
```

"Create an **integer** named **calls** that **gets** the **value 4**."

Printing values

```
int calls = 4;
printf("calls equals %i", calls);
```

Printing values

```
int calls = 4;
printf("calls equals %i", calls);
```

format code

Printing values

```
int calls = 4;
printf("calls equals %i", calls);
```

placeholder   value

Types and format codes

Numbers	Text	True/False
`int (%i)`	`char (%c)`	`bool (%d)`
`float (%f)`	`string (%s)`	

Types and format codes

Numbers	Text	True/False
`int (%i)`	`char (%c)`	`bool (%d)`
`float (%f)`	`string (%s)`	

Part 2

Hello, cs50.dev!

Part 3

breaking down loops and conditionals

```c
if (calls < 1)
{
    printf("Call more often!");
}
```

boolean expression

```
if (calls < 1)
{
    printf("Call more often!");
}
```

conditional

$\downarrow$

```
if (calls < 1)
{
    printf("Call more often!");
}
```

```
if (calls < 1)
{
    printf("Call more often!");
}
```

conditional code

```
if (calls < 1)
{
    printf("Call more often!");
}
else
{
    printf("Thanks for calling!");
}
```

```
if (calls < 1)
{
    printf("Call more often!");
}
else          mutually exclusive
{
    printf("Thanks for calling!");
}
```

```
int i = 0;
while (i < 10)
{
    printf("%i\n", i);
    i = i + 1;
}
```

initialization

```
int i = 0;
while (i < 10)
{
    printf("%i\n", i);
    i = i + 1;
}
```

boolean expression

```
int i = 0;
while (i < 10)
{
    printf("%i\n", i);
    i = i + 1;
}
```

```
int i = 0;
while (i < 10)
{
    printf("%i\n", i);
    i = i + 1;
}
```

$\uparrow$

increment

```
int i = 0;
while (i < 10)
{
    printf("%i\n", i);
    i = i + 1;
}
```

```
for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
```

initialization

```
for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
```

boolean expression

↓

```
for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
```

increment

```
for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
```

```
for (int i = 0; i < 10; i++)
{
    printf("%i\n", i);
}
```

```
int n;
do
{
    n = get_int("N: ");
}
while (n <= 0);
```

```
int n;
do
{
    n = get_int("N: ");
}
while (n <= 0);
```

```
int n;
do
{
    n = get_int("N: ");
}
while (n <= 0);
```

Part 4

“int’s a me, Mario!”

- 123

- Work an example yourself
- Write down exactly what you did
- Create a generalization (algorithm) after working multiple examples
- Test your algorithm by hand
- Translate your algorithm to code
- Find bugs in your code by running test cases
- Debug (and critique) your code

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What’s up next?

- Submit pset 1, check 1
- Section reassignments on Friday
- Office Hours throughout week
- Next time: arrays!

This was CS50 section.