

Types and Compilation

* What is a type check?

Make sure that data in a place in your program is of the right type.

* What is a type?

A type is a set of values.*

* What is a set?

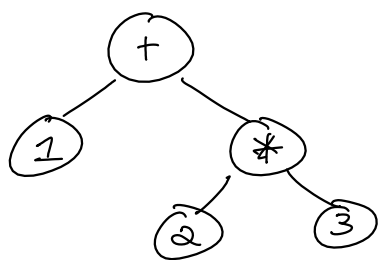
A collection of things. [Everything is either in the set or (exclusively) not in the set.]

{ 5, 0, 11, "hello" }

Typically, a compiler uses a type system to

1. Find mistakes (or prove no mistakes) for some limited definition of "mistake"

2. optimize generated code



1 + 2 * 3 false

11
)

```
mov rax, 2
mov [rbp-8], rax
mov rax, 4
mov [rbp-16], rax
mov rax, 6
mov [rbp-24], rax
mov rax, [rbp-16]
sar rax, 1
imul rax, [rbp-24]
mov [rbp-16], rax
mov rax, [rbp-8]
add rax, [rbp-16]
```

is this an it?

Typing times:

1. Statically
2. Dynamically
3. Not

C, Java, OCaml, C++
Python, Cardinal
Bluebird, C, C++

```
int * p = ...;  
int x = (int) p;
```