Intro to CS + Fundamental Types

Remix CS 2019-20

What we will cover today

- What is coding?
- What are primitive or fundamental types?
  - Booleans
  - Integers
  - Floating Point Numbers
  - Strings

Intro to CS

What is coding?

- **code:** instructions for a computer to understand and perform
- **good code:** instructions that are-
  - **human-readable**: easy for people to understand too :)
  - **reusable**: we aren't rewriting steps over and over again
  - tested: made sure code works as intended for all situations
- **coding:** YOU (yes you) creating these instructions for the computer

What is coding? (cont.)

- code can be written using one of the many computer languages that already exist
- each language has unique features that make it useful for specific types of problems
- for these lectures, we are using the language **python**

What is coding? (cont.)

- Instructions are used to manipulate data the computer has access to
- This is very similar to a recipe in a cookbook
  - **data** ➜ ingredients of recipe
  - **instructions** ➜ cooking steps of recipe
- 1st concept we will cover: some of the important types of data we can see when coding

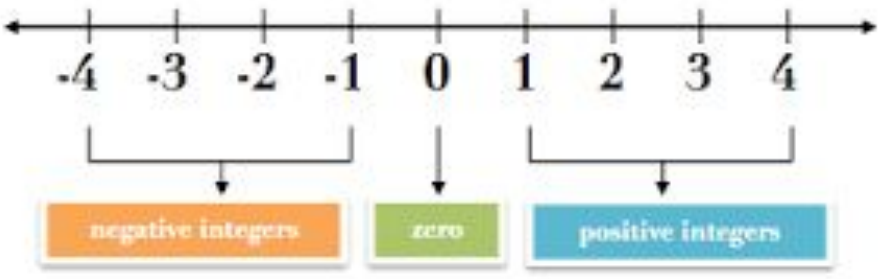
Fundamental Types

What are primitives or fundamental types?

- Can be referred to as either primitives or fundamental data types
- Are the building blocks for programs
- Can be combined to create more complex ways of storing data or information in you programs

Integers **(int)**

- Integers are a data type that store an integer value (think whole number), such as ..., -2, -1, 0, 1, 2, ...
- Integers cannot store decimal values



Floating Point Numbers (**float)**

- Floating point numbers, often referred to as “floats” are used to store decimals
- Can store values such as -2.8, 0.0, 100.2493
- Used to store fractional values

Strings **(str)**

- Strings are a data type that stores text values
- In python, strings are denoted by placing the value of the string in single or double quotation marks
- Examples: ‘c’ “hello world” ‘this is the number 4’ “strings are cool!”

Booleans **(bool)**

- Booleans are a data type that can only store one of 2 states, true or false
- This means that any boolean is either equivalent to true or false

- We will discuss booleans more later when we cover conditional statements

Try to identify the following data elements as Booleans, Integers, Floats, or Strings

1. 5
2. True
3. -6.7
4. 9.3
5. “Hello”
6. 2.0
7. 0
8. -5.0
9. “False”
10. 0.0
11. ‘C’
12. “8.9”

Try to identify the following data elements as Booleans, Integers, Floats, or Strings

1. 5 - int
2. True - bool
3. -6.7 - float
4. 9.3 - float
5. “Hello” - str
6. 2.0 - float
7. 0 - int
8. -5.0 - float
9. “False” - str
10. 0.0 - float
11. ‘C’ - str
12. “8.9” - str

What data type would you use to store each of the following pieces of data?

1. The name of a user for an app
2. The total number of people on a train
3. The average of multiple test scores
4. Whether or not a task has been completed
5. The quotient of 2 numbers

What data type would you use to store each of the following pieces of data?

1. The name of a user for an app - str
2. The total number of people on a train - int
3. The average of multiple test scores - float
4. Whether or not a task has been completed - bool
5. The quotient of 2 numbers - float