Aim: How do we use data in Python?

Turn-and-talk: Without using a calculator…

- What is 23÷4?
  - How do you know?
- Make a prediction: what do you think the Python interpreter will return if we try to divide 23 by 4?

DO NOT try it yet!

Data Types

Python has to distinguish between different types of **data**

- integer
- float
- string
- boolean

Numbers: integers and floats

integer: (***int*** for short)

positive or negative whole number (or zero)

- 6, 12345, -23, 0, -125709847023

float:

floating point number

decimal point can go anywhere in the number (it's floating)

- 6.0, 123.45, -2.3, 0.33333333333333

Code Along Mode

Basic math with ints and floats

Launch your Python REPL (replit!)

- What are 2 ways of getting to it?
- Which side is our interpreter?

Let's try...

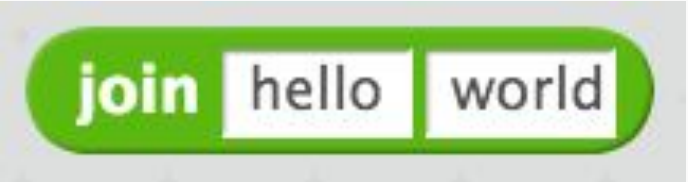
23/4	
23/4.0	
23.0/4	
23.0/4.0	
23+4	
23*4	
23-4	

Strings

"This is a string"

"Putting one string next to another" + " is called concatenation"

Look familiar?



Make a prediction for each argument :

- "23+4"
- 23+4
- "23"+"4"
- "23" + 4

Booleans

Booleans are either **True** or **False**

- Notice the capitalization!

  True has an inherent value of 1

  False has an inherent value of 0

Make a prediction...

- True + False
- True + True

We'll learn more about conditionals later, but for now, try

- **5==4**
- **'five'=='five'**

IndePAIRdent Work Mode

Data Predictions

Page 1: make all predictions first, ***then*** test them!

- If your prediction wasn't quite write, put the correct answer in the ***Revised Answer*** column.

Page 2: Once you've finished Page 1, try going the opposite direction on Page 2!

Share your ideas with your neighbor, but write on your own worksheet!

Transforming Data Types

`str(thing)` returns the string version of the thing

- `str(9)`
- `str(9.0)`

`int(thing)` returns the integer version of the thing

- `int(9.0)`
- `int('9')`

`float(thing)` returns the float version of the thing

- `float(9)`
- `float('9')`

Discussion Mode

2 steps this time

What happens when we do

```
int('9.0')
```

Why isn't this working?

How do we solve this problem?

```
'9.0' → 9
```

```
'9.0' → 9.0 → 9
```

```
int(float('9.0'))
```

Can we go the other way?

```
9 → '9.0'
```

Why can't we just reverse our functions?

```
float(int(9))
```

```
9 → 9.0 → '9.0'
```

```
str(float(9))
```

IndePAIRdent mode

Please open this form!
https://forms.gle/WiyBgdVZsLo8wh8DA

You are working independently but may use your partner for help!

Summary

Think!

How would converting data types be helpful to programmers?