Casting

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Python

What is “Casting”???

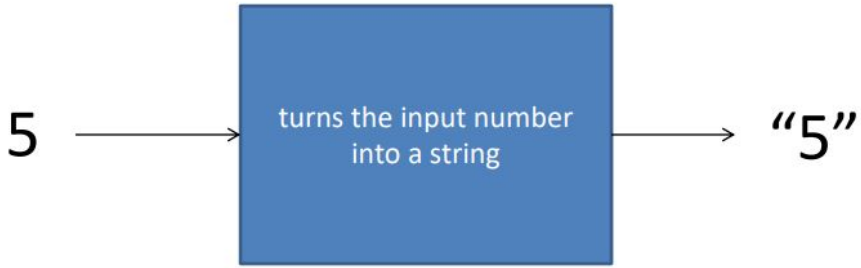
What if… we wanted to change an **INTEGER** into a **STRING**!?

Casting is how we’d do it.

Casting Definition

Casting is when you change the **data type** from **one type to another**.

Observe the diagram below:



Our goal here is to change the **number 5** into the **string “5”**

How to cast a variable into a **String**

We can put any value inside the code `str( )` and it will turn into a String.

```
x = str("s1") # x will be 's1'

y = str(2)    # y will be '2'

z = str(3.0)  # z will be '3.0'
```

The integer 2 is now converted into String ‘2’

The double 3.0 is now converted into String ‘3.0’

How to cast a variable into an **integer**

We can put any value inside the code `int( )` and it will turn into an integer.

```
x = int(1)   # x will be 1
y = int(2.8) # y will be 2
z = int("3") # z will be 3
```

X stores the integer value 1.

Y stores the integer value 2 because of rounding down a double.

Z stores the integer 3 changed from a string

Now x, y, and z can be used as integers! Ex: we can do math with them!

Why is this important???

In short, Python doesn't like to combine **Strings** and **Numbers**

```
print("I am " + 3 + " years old.")
```

The code above seems fine and would work in Java or C++

In **Python**, this is an error.

Concatenation Error

The follow code gives the error below.

```
print("I am " + 3 + " years old.")
```

```
  File "/home/ec2-user/environment/Test/base.py", line 4, in <module>
    print("I am " + 3 + " years old.")
TypeError: can only concatenate str (not "int") to str
```

The error above says that you **can only concatenate str to str.**

It doesn’t like the integers!!!

Concatenation Error Fix

To fix this,

```
print("I am " + 3 + " years old.")
```

We can **cast** the **3** into a **String**

```
print("I am " + str(3) + " years old.")
```

Similarly, we can do the same with casting **strings to integers** when wanting to work only with integers.

Lab: Casting

1. Recreate the C++ multiplication lab.
2. Write a program that multiplies 4 by 2 and writes the output to the screen.
    a. This should be done with 3 separate variables.

Sample output:

The first number is: 4
The second number is: 2
The answer is: 8