Console I/O

Console Output

The C++ Way:

```
#include <iostream>

std::cout << "This is the message to output to the console." << std::endl;
```

The Python Way:

```
print("This is the message to output to the console."
```

Console Input

The C++ Way:

```
#include <iostream>
#include <string>

std::string var_input_string;
std::cin >> var_input_string;
```

The Python Way:

```
input_string = input(“Message to the user”)
```

Console Input

Input comes in as a string variable.

Convert to int

```
age = int(input(“What is your age? ”))
```

Convert to float

```
degrees = float(input(“Please enter degrees. ”)
```

Variables, Data Types & Values

Data Types

Primitive Data Types in C++:

C++ Keyword	Data Type
int, short, long	Integer
char	Character
bool	Boolean (true/false)
float, double	Floating point
void	Valueless
wchar_t	Wide character

Primitive Data Types in Python:

Python Keyword	Data Type
int, float	Number
str	String

Simple Number Operators

Operators	Description
+	Addition
-	Subtraction
*	Multiplication
/	Division (true)
==, !=	Equality, not equality
%	Remainder
//	Floor Division
**	Power

*More operators listed in book p. 141

Simple String Operators

Operators	Description
+	Concatenate
*	Repeat
S[i]	Index
len(S)	Lenght
S.find(“p”)	Search
S.replace(“p”,”x”)	Replace
S.lower(), S.upper()	Case conversion

*More operators listed in book p. 198

Helpful Tips

Operators

Operators only work on same types:

```
length = 20
width = 40
area = length * width

first_name = "Lindsay"
welcome = "Hello, " + first_name + "!"
print(welcome)
```

Error:

```
length = 20
width = 40
area = length * width
statement = "The area is " + area + "."
print(statement)
```

The Fix: Conversion Methods

Number to string, use str():

```
length = 20
width = 40
area = length * width
statement = "The area is " + str(area) + "."
print(statement)
```

String to number, use int() or float():

```
age = int(input("What is your age? "))
dog_years = age * 7
statement = "You are " + str(dog_years) + " years old in dog years."
print(statement)
```

Operators Caveat

```
print("Hi"*4)
```

Works. Why?

Comments

Use “#” to input lines the computer won’t read

```
# Calculate the area
length = 20
width = 40
area = length * width
statement = "The area is " + str(area) + "."
print(statement)
```