

MTH1W Python Reference

Python is a programming language that is relatively easy to learn and use. You can access Python online through a free service like replit.com, if you are unable to install Python on your computer.



Basic Mathematics

Basic mathematical operations

Operation	Symbol	Example
Addition	+	A+B
Subtraction	-	A-B
Multiplication	*	A*B
Division	/	A/B
Exponentiation	**	A**B
Parentheses	()	A*(B+C)

Enter these commands in the Console

```
▶ 3.5+4.2
7.7
▶ 2**3
8
▶ 2+3*4
14
▶ (2+3)*4
20
```

Built-in mathematical functions

Action	Command
Rounding	<code>round(val, decimals)</code>
Abs. value	<code>abs(val)</code>
Minimum	<code>min(val1, val2, ...)</code>
Maximum	<code>max(val1, val2, ...)</code>

Enter these commands in the Console

```
▶ round(3.14159, 2)
3.14
▶ abs(-7)
7
▶ max(5, 9, 3, -1, 7.5)
9
```

Variables

Creating and modifying values

Action	Symbol	Example
Assignment	=	width = 5
Increment	+=	count += 1
Decrement	-=	num -= 2

Enter these commands in the Console

```
▶ number = 6
▶ number*2
12
▶ number
6
▶ number += 3.5
▶ number
9.5
```

Input, Output and Number Types

Displaying information, receiving user input, and converting input to numbers

Action	Comand	Example
Display text	print	print("Text")
Display multiple things	print	print("First", "Second", "Third", ...)
Read text from the user	input	name = input("Enter your name: ")
Convert to an integer	int	width = int(width)
Convert to a decimal	float	length = float(length)

main.py × Enter these commands in the Code Window, then click Run

```
# Calculate the average of two integers.
first_num = input("Enter an integer: ")
first_num = int(first_num)
second_num = input("Enter another: ")
second_num = int(second_num)
average = (first_num+second_num)/2
print("The average of the two values is", average)
```

Making Decisions

Comparisons

Comparison	Operator	Example
Equal to	==	value == 2
Not equal to	!=	count != 10
Greater than	>	area > 6.25
Greater/equal	>=	width >= 4
Less than	<	height < 12
Less/equal	<=	cost <= 2.5

Enter these commands in the Console

```
▶ length = 8
▶ width = 5
▶ length == width
False
▶ height = 5
▶ width > height
False
▶ width >= height
True
```

Make decisions based on comparisons

```
if condition1:           ← first condition must begin with if
    code                 ← code will run only if the condition is true
elif condition2:        ← alternative conditions are designated using elif
    code
elif condition3:
    code
...
else:                   ← to handle all other possibilities use else
    code
```

main.py × Enter these commands in the Code Window, then click Run

```
# Determine if a given integer is positive, negative or zero.
value = input("Enter an integer: ")
value = int(value)
if value == 0:
    print("You entered the number zero.")
elif value > 0:
    print("The value you entered is positive.")
else:
    print("The value you entered is negative.")
```

Repeating Code (Loops)

Repeat code over a fixed range of values

```
for variable in range(start, stop, count by):  
    code
```

Note: the value of stop is not included in the counting.

```
main.py × Enter these commands in the Code Window, then click Run  
  
# Display the value of all squares less than a given integer.  
integer = input("Enter an integer: ")  
integer = int(integer)  
for value in range(1, integer, 1):  
    square = value**2  
    print(value, "squared is", square)
```

Repeat code while a condition is true

```
while condition:  
    code
```

```
main.py × Enter these commands in the Code Window, then click Run  
  
# Determine the sum of an arbitrary number of positive integers  
# entered by the user. Enter a non-positive value to stop.  
value = input("Enter a positive integer: ")  
value = int(value)  
total = 0  
while value > 0:  
    total += value  
    value = input("Enter another integer: ")  
    value = int(value)  
if total == 0:  
    print("No positive integers were entered!")  
else:  
    print("The sum of all positive integers is", total)
```