

# ECTTP: Loops

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<https://github.com/vmuijrs/ECTTP>

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# Course Overview

- Week One: Course overview
- Week Two: Variables
- Week Three: Conditions
- **Week Four: Loops ←**
- Week Five: Functions
- Week Six:
- Week Seven:
- Week Eight: (Files, Exceptions, IO)
- **First Test!**
- Week Eleven: Lists
- Week Twelve: Classes and Objects
- Week Thirteen:
- Week Fourteen:
- **Second Test!**

# Our Super Powers so far...

- Variables! (Int, String, Boolean and Float)
- Mathematical Operators (+, \*, -, /)
- Boolean Operators (and or not, >, <, ==, >=, <=)
- If- statements!



# Order of Execution

Python will always evaluate the arithmetic operators first (\*\* is highest, then multiplication/division, then addition/subtraction). Next comes the relational operators.

Finally, the logical operators are done last.

Level Category Operators:

- 8 parentheses (,)
- 7(high) exponent \*\*
- 6 multiplication \*,/,//,%
- 5 addition +,-
- 4 relational ==,!=,<=,>=,>,<
- 3 logical not
- 2 logical and
- 1(low) logical or

# If-Statement Recap

```
x = 5
```

```
y = 2
```

```
if x**3 > 125 and y < 5/2 or not 10 % 3 == 0:
```

```
    print ("The If is True!")
```

```
else:
```

```
    print ( "The If is False!")
```

# While-loop

- While some condition is true, execute the code

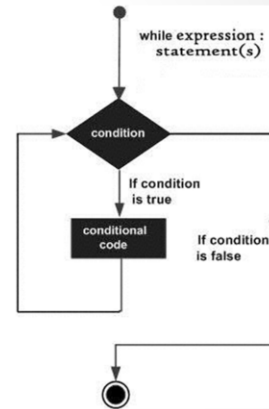
```
x = 0
```

```
while x < 5 :
```

```
    x = x + 1
```

```
    print("I am looping!")
```

```
print("Aaaaand we'r e done")
```



# It's endless!

```
while <boolean>:  
    <code>
```

Make sure your while-loop gets out of it, otherwise your program will freeze your pc!



```
while True:  
    print("I will print forever!")
```

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# For-loop

The for-loop let's the code run within a range, in this way the code is executed a limited amount of times

```
for i in range ( 3, 6 ):
    print ("I am printed 3 times")
```

i gets the value 3  
then prints  
i gets the value 4  
then prints  
i gets the value 5  
then prints  
then the for-loop exits

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# Similarity

```
while(x < 5)
    print " x is " + str(x)
    x += 1
print "this is it!"
```

```
for i in range (0,6):
    print " x is " + str(x)
    x+=1
print "this is it!"
```

The while and for-loop have the same functionality but a for-loop is a little bit safer, because it will always stop at some point

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# And now some randomness

- The random function gives an integer or float between two input values

`random(3, 6)` → Gives a number between 3 and 6, but excluding 6

`random(5)` → Gives a number between 0 and 5 (excluding 5)



# Modulo

- The '%' operator can be used to calculate a remainder

`x = 10 % 3` # This becomes 1, because we subtract 3 from 10 until there is a number left which is smaller than 3

`x % 2 == 0` can be used to check if a number is even

`x % 2 == 1` can be used to check if a number is odd

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# Some Functions in Processing

`max( a, b )` #returns the largest of a and b

`min ( a, b )` # returns the smallest of a and b

`lerp ( a, b, t )` # returns a value between a and b  
based on t (t is always a value between 0 and 1)

`( a + ( b - a ) * t )`

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# String

A string is a **list** of characters. This means that a string is a collection of multiple constants.

```
string_myString = "Some String"
```

The len() function can be used to get the length of a string

To access a single character of a string, access it by using the index of that character

```
string_myString[0] = "S"
```

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# User Input in Processing

```
def keyPressed():  
    if key == 'b':  
        print("Do something here, if the b-key is  
        pressed!")  
  
def keyReleased():  
    if key == 'b':  
        print("Do something when the b-key is  
        released!")
```

# Getting the mouse position

mouseX # denotes the X position of the mouse

mouseY # denotes the Y position of the mouse

```
rect (mouseX, mouseY, 100, 50)
```

#draw a rectangle at the mouse position

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# CodingBat

- Now let's practise some more:
- <http://codingbat.com/python>



# Fourth lab is online

[https://github.com/vmuijters/ECTP/blob/master/Labs/Lab\\_4.md](https://github.com/vmuijters/ECTP/blob/master/Labs/Lab_4.md)

#For examples/tutorials and references!  
py.processing.org

#For more practise with python!  
codecademy.com

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