

Python 02

Install Thonny

<https://thonny.org/>



String operators

Adding two strings is concatenation

Expression	Example	Result
String + String	"a"+"b"	"ab"
String * integer	"a" * 3	"aaa"
Integer * String	3 * "a"	"aaa"



User input

```
name = input("What is your name?")
```

```
print(name)
```

Try writing code that asks for a number and prints the number plus 2



User Input answer

```
num = input("Enter a number")  
print(num + 2);
```



Casting

```
num = "3"
```

```
num = num + 1
```

```
Num = int(num) + 1
```

Will not work

Changes argument into an
integer first



Shortcuts

$a += 3$ # $a = a + 3$

$a *= 2$ # $a = a * 2$

$a ?= b$ # $a = a ? b$; b is any operator



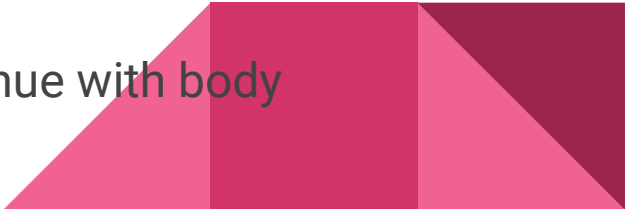
While loops

`while boolean_expression:`

 Inside of loop

 Execute code

Outside of loop

1. Evaluate boolean expression
 2. If boolean is True: run the code inside the loop and then check the boolean again
 3. If the boolean is false, skip the entire body and continue with body
- 

Try

```
n = 5
```

```
while n<10:
```

```
    print(n)
```

```
print("out of loop")
```

What happens?



Infinite loop

N is never updated so the loop keeps running. We can fix this by adding to n.

```
n = 5
```

```
while n<10:
```

```
    n = n + 1
```

```
    print(n)
```

```
print("out of loop")
```

Initialize, condition, get it closer to becoming false



For loop

Lets you execute code a predetermined number of times

```
for i in range(4): i  
    print("Hello!")
```

#Result

Hello!

Hello!

Hello!

Hello!



For loop

I is a variable

```
for i in range(4):
```

```
    print(i)
```

0

1

2

3



For loop

```
for i in range(1, 6);  
    print(i)
```

1

2

3

4

5



For loop

```
for i in range (1, 6, 3):
```

```
    print(i)
```

1

4



range

```
for i in range(start_num, end_num, increment):
```

Commands

Starts at start_num, changes by increment, ends before end_num

Includes start_num, excludes end_num



Range

What numbers do this range include?

$(0, 10, 2)$

$(0, 10, 3)$



Nested For loop

```
for i in range(5):  
    for j in range(3):  
        print("hi!")
```

How many "hi!"s will be printed?



For loops vs while loops

For loops if you know how many times you want to run the loop

While loops if you don't know how many times.



Break and continue

while condition:

 if something:

 break

Skips the whole loop

while condition:

 if something:
 continue

Goes back to the top of the while loop,
skipping everything



Practice

Write a while loop that prints all the perfect squares between 1 and 10000 inclusive. Do not square 10000 all squares are found between 1 and 10000.



Codingbat

<https://codingbat.com/prob/p193507>

