

UiO : Det matematisk-naturvitenskapelige fakultet

Loops

IN1000

Henrik Løvold,
Institutt for Informatikk, UiO

What are loops?

- Used for code repetition
- There are two kinds of loops in Python
  - The while loop
  - The for loop
  - We will have a look at these shortly…
- Often used in conjunction with lists

The while loop

- A state loop
  - As long as <condition> is satisfied, continue doing something
- Has a wide variety of use cases
  - Counting
  - Waiting for correct input
- Warning: when used for counting, remember to increment your counting variable!

```
a = 1
while a < 5:
    print(a)
    a = a + 1
```

Output:

```
1
2
3
4
```

The for loop

- «Counting loop»
  - For each element in… do something
  - In our case used with numbers in a range
  - …but often used in conjunction with lists
- The *range* function
  - Specify an interval through which you wish to iterate
  - Takes one, two or three arguments
  - Includes the starting parameter,
    does not include the ending parameter!

```
for i in range(0, 5):
    print(i)
```

Output:

```
0
1
2
3
4
```

Exercises

Task 1

Write a program that prints every whole number from 10 up to and including 20

a) Using a while loop

b) Using a for loop

Two kinds of loops

- Loops = code repetition

	While	For
Kind	«State loop»	«Counting loop»
Generally	while <condition>: <do this>	for <variable> in range(start, end, step): <do this>

Example	`a = 0`
	`while a < 5:`
	`  print("You're cool!")`
	`  a = a + 1`
		`for i in range(0, 5):`
		`  print("Current number:", i)`

Exercises

Task 2

Write a program that prints every odd number between 0 and 100

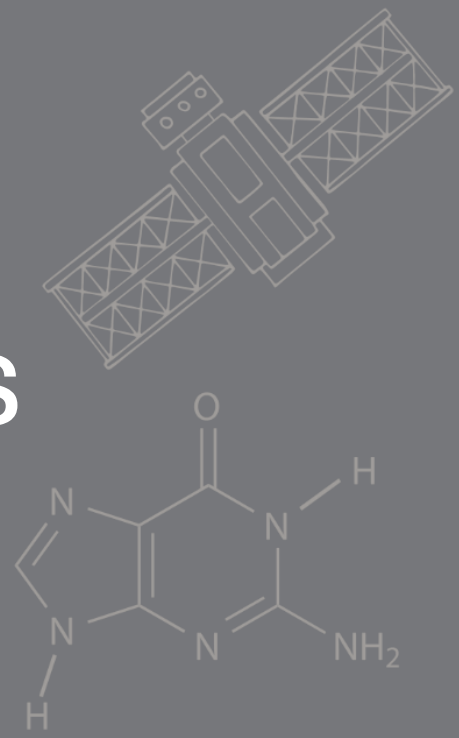
a) Using the step parameter of the for loop

b) Using an if-statement inside a while loop

*(hint: **a % 2** gives the remainder of **a** divided by **2**)*



Lists and loops





Adding data through loops

```
numbers = []
for i in range(0, 10):
    numbers.append(i)
print(numbers)
```

Accessing data through loops

```
numbers = [1, 2, 3, 4, 5]
for number in numbers:
    print(number)
```

```
numbers = [1, 2, 3, 4, 5]
for i in range(len(numbers)):
    print(numbers[i])
```

Exercises

- Make an empty list
- Add all even numbers from 0 to 10 to the list using a loop
- Print all the values of the list using the *for elem in list* syntax

Loops and dictionaries

Exercises

- Make a dictionary and fill it with names related to phone numbers
- Using a while loop:
  - Allow the user to make new entries using input
  - When the user writes STOP, you leave the loop and…
- Print all the values inside the dictionary