



12A

LISTS

WAT LEREN WE?

- ▶ Veranderbaarheid van lists
- ▶ Sublijst
- ▶ Gebruik van `+` en `*` met lists
- ▶ List methodes `append()`, `extend()`, `insert()`, `remove()`, `pop()`, `index()`, `count()`, `sort()`, en `reverse()`
- ▶ ~~`sort()` met key en lambda~~
- ▶ ~~`del` met lists~~
- ▶ Aliases
- ▶ Het gereserveerde woord `is`
- ▶ ~~List kopieën~~
- ▶ ~~Diepe kopieën van lists via `deepcopy()`~~
- ▶ ~~Lists als argumenten~~
- ▶ ~~Nesten van lists~~
- ▶ List casting
- ▶ ~~List comprehensions~~



WAT?

- ▶ Geordende verzameling of collectie van elementen.

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> 'Korneel' in matrozen
```

```
False
```

```
>>> pogingen = [1.23, 1.35, 1.31]
```

```
>>> max(pogingen)
```

```
1.35
```

```
>>> sum(pogingen)
```

```
3.89
```



NOG VOORBEELDEN

- ▶ Lijsten met elementen van verschillende types:

```
>>> land = ['Belgie', 'Brussel', 11358357, ('Nederlands', 'Frans', 'Duits')]
```

```
>>> len(land)
```

```
4
```

```
>>> print(land)
```

```
['Belgie', 'Brussel', 11358357]
```

```
>>> min(land)
```

Traceback (most recent call last):

File "<input>", line 1, in <module>

TypeError: '<' not supported between instances of 'int' and 'str'



MUTABLE

- ▶ De inhoud van lijsten kan je wijzigen.

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> matrozen[2] = 'Korneel'
```

```
>>> print(matrozen[-1])
```

```
Korneel
```



ITERABLE

- ▶ De elementen van een lijst kan je overlopen.

```
matrozen = ['Jan', 'Piet', 'Piet', 'Joris']
```

```
print(matrozen[0])  
for i in range(1, len(matrozen)):  
    if matrozen[i] != matrozen[i - 1]:  
        print(matrozen[i])
```

```
Jan  
Piet  
Joris
```

```
for matroos in matrozen:  
    print(matroos)
```

```
Jan  
Piet  
Piet  
Joris
```



SUBLIST

- ▶ Zoals bij strings:

```
>>> pogingen = [1.23, 1.35, 1.31, 1.33, 1.27]
```

```
>>> print(pogingen[1:3])
```

```
[1.35, 1.31]
```

```
>>> print(pogingen[::2])
```

```
[1.23, 1.31, 1.27]
```

```
>>> print(pogingen[-3:-1])
```

```
[1.31, 1.33]
```



ELEMENTEN VERWIJDEREN

- ▶ Eén of meerdere opeenvolgende elementen verwijderen:

```
>>> matrozen = ['Jan', 'Piet', 'Joris', 'Korneel']  
>>> matrozen[0:2] = []  
>>> print(matrozen)  
['Joris', 'Korneel']  
>>> matrozen[0:1] = []  
>>> print(matrozen)  
['Korneel']
```



OPERATOREN

► + en *

```
>>> matrozen = ['Jan', 'Piet'] + ['Joris']
```

```
>>> matrozen += ['Korneel']
```

```
>>> print(matrozen)
```

```
['Jan', 'Piet', 'Joris', 'Korneel']
```

```
>>> matrozen = 3 * ['Jan']
```

```
>>> print(matrozen)
```

```
['Jan', 'Jan', 'Jan']
```



OPERATOREN

► Gevaar:

```
>>> matrozen = ['Jan']  
>>> matrozen += 'Piet'  
>>> print(matrozen)  
['Jan', 'P', 'i', 'e', 't']
```



STRING METHODE MET LIST ALS RETOURWAARDE

- ▶ `split()`: string splitsen in woordenlijst.

```
>>> taal = 'programmeren in python'
>>> taal.split()
['programmeren', 'in', 'python']
>>> telegram = 'programmeren:in:python'
>>> telegram.split(':')
['programmeren', 'in', 'python']
```



STRING METHODE MET LIST ALS PARAMETER

- ▶ `join()`: van woordenlijst naar string.

```
>>> taal = 'programmeren in python'
```

```
>>> lijst = taal.split()
```

```
>>> print(lijst)
```

```
['programmeren', 'in', 'python']
```

```
>>> ''.join(lijst)
```

```
'programmereninpython'
```

```
>>> ' '.join(lijst)
```

```
'programmeren in python'
```



LIST METHODES

- ▶ `append()` en `insert()`: één element toevoegen.

```
>>> matrozen = ['Jan']  
  
>>> matrozen.append('Joris')  
  
>>> print(matrozen)  
['Jan', 'Joris']  
  
>>> matrozen.insert(1, 'Piet')  
  
>>> print(matrozen)  
['Jan', 'Piet', 'Joris']
```



LIST METHODES

- ▶ `extend()`: lijst uitbreiden met lijst.

```
>>> matrozen = ['Jan']
```

```
>>> matrozen.extend(['Piet', 'Joris'])
```

```
>>> print(matrozen)
```

```
['Jan', 'Piet', 'Joris']
```



LIST METHODES

- ▶ `remove()`: één element verwijderen.

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> matrozen.remove('Piet')
```

```
>>> print(matrozen)
```

```
>>> matrozen.remove('Korneel')
```

Traceback (most recent call last):

File "<input>", line 1, in <module>

ValueError: list.remove(x): x not in list



LIST METHODES

- ▶ `pop()`: één element op gegeven index verwijderen.

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> matrozen.pop(1)
```

```
'Piet'
```

```
>>> print(matrozen)
```

```
['Jan', 'Joris']
```

```
>>> matrozen.pop()
```

```
'Joris'
```



LIST METHODES

- ▶ `index()`: van een element de index in de lijst bepalen.

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> matrozen.index('Piet')
```

```
1
```

```
>>> matrozen.index('Korneel')
```

Traceback (most recent call last):

File "<input>", line 1, in <module>

ValueError: 'Korneel' is not in list



LIST METHODES

- ▶ `sort()`: de lijst sorteren

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> matrozen.sort()
```

```
>>> print(matrozen)
```

```
['Jan', 'Joris', 'Piet']
```

```
>>> matrozen.sort(reverse=True)
```

```
>>> print(matrozen)
```

```
['Piet', 'Joris', 'Jan']
```



LIST METHODES

- ▶ `reverse()`: een lijst omkeren.

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
```

```
>>> matrozen.reverse()
```

```
>>> print(matrozen)
```

```
['Joris', 'Piet', 'Jan']
```



LIST METHODES

- ▶ `count()`: tellen hoeveel keer een element voorkomt.

```
>>> matrozen = ['Jan', 'Piet', 'Piet']
```

```
>>> matrozen.count('Piet')
```

```
2
```

```
>>> matrozen.count('Korneel')
```

```
0
```



ALIAS

- ▶ Gelijkheid van lijsten testen met `is`:

```
>>> matrozen = ['Jan', 'Piet', 'Joris']
>>> kapiteins = matrozen
>>> kapiteins.append('Korneel')
>>> print(matrozen)
['Jan', 'Piet', 'Joris', 'Korneel']
>>> kapiteins is matrozen
True
>>> zeelui = ['Jan', 'Piet', 'Joris', 'Korneel']
>>> zeelui is matrozen
False
```



LIST CASTING

- ▶ Van **string** naar **list** en van **tuple** naar **list** en terug

```
>>> list('Korneel')
```

```
['K', 'o', 'r', 'n', 'e', 'e', 'l']
```

```
>>> list(('België', 'Brussel', 11358357))
```

```
['België', 'Brussel', 11358357]
```

```
>>> tuple(['België', 'Brussel', 11358357])
```

```
('België', 'Brussel', 11358357)
```

