

Einführung in Python

1) Datentypen:

```
In [16]: #String/Zeichenkette:  
name = "Lovelace"  
print(name)  
# Trivia: Anna Lovelace hat das Programmieren erfunden
```

Lovelace

```
In [17]: #Integer/Ganze Zahl:  
age = 73  
print(age)
```

73

```
In [18]: #Float/Gleitkommazahl:  
size = 1.7123  
print(size)
```

1.7123

```
In [19]: #Boolean:  
knows_math = True  
print(knows_math)  
likes_slacking = False  
print(likes_slacking)
```

True
False

2) Operatoren:

```
In [20]: #Addition:  
5+5
```

Out[20]: 10

```
In [21]: #Multiplikation:  
age * 100
```

Out[21]: 7300

```
In [22]: #Addition von Variablen:  
name + name
```

Out[22]: 'LovelaceLovelace'

```
In [23]: #Multiplikation von Variabler und String:  
name * 10
```

Out[23]: 'LovelaceLovelaceLovelaceLovelaceLovelaceLovelaceLovelaceLovelaceLovelaceLovelaceLovelaceLovelace'

```
In [24]: #name + 10  
#TypeError: must be str, not int  
  
name + '10'
```

Out[24]: 'Lovelace10'

```
In [25]: #Division von Variablen:  
size/age
```

Out[25]: 0.023456164383561642

```
In [26]: #Integer zu String umformen:  
name + str(10)
```

Out[26]: 'Lovelace10'

```
In [27]: number_articles = "50"
```

```
In [28]: #Typ einer Variablen anzeigen lassen:  
type(number_articles)
```

Out[28]: str

```
In [29]: #String zu Integer umformen:  
int(number_articles)
```

Out[29]: 50

3) Funktionen und Methoden:

```
In [30]: #Funktionen enden immer auf runden Klammern!
```

```
In [31]: #Länge eines Strings zählen:  
len(name)
```

Out[31]: 8

```
In [32]: #String in Großbuchstaben in der Ausgabe ausgeben:  
name.upper()
```

Out[32]: 'LOVELACE'

```
In [33]: print(name)
```

Lovelace

```
In [34]: #String in Großbuchstaben umschreiben:  
name_upper = name.upper()  
print(name_upper)
```

LOVELACE

```
In [35]: #Wie oft kommt das "e" in der Variable vor?  
name.count("e")
```

Out[35]: 2

```
In [36]: #Teil der Variablen in der Ausgabe ersetzen:  
name.replace("lace", " is everywhere")
```

Out[36]: 'Love is everywhere'

4) Listen:

```
In [37]: #Liste mit mehreren Werten einer Variablen zuweisen:  
names = ["Lovelace",  
         "Darwin",  
         "Curie",  
         "Hawking"]  
#Tipp: innerhalb von Klammern können Zeilen umgebrochen werden  
print(names)
```

['Lovelace', 'Darwin', 'Curie', 'Hawking']

```
In [38]: #Position der Liste direkt ansteuern (0te Position wird mitgezählt):  
names[2]
```

Out[38]: 'Curie'

```
In [39]: #Letztes Element der Liste ausgeben:  
names[-1]
```

Out[39]: 'Hawking'

```
In [40]: #Die ersten drei Positionen ausgeben:  
names[0:3]  
#Achtung: 0te Position inklusive, 3te Position exklusive  
 #(Rückgabe: Pos. 0, 1, 2)
```

Out[40]: ['Lovelace', 'Darwin', 'Curie']

```
In [41]: #Liste ab 3ter Position ausgeben (Slicing):  
names[2:]
```

Out[41]: ['Curie', 'Hawking']

```
In [42]: #Liste bis 3te Position ausgeben (Slicing):  
names [:2]
```

Out[42]: ['Lovelace', 'Darwin']

5) Dictionaries:

Key = Schlüssel, Value = Wert

```
In [43]: #Dictionary anlegen:
authors_birthYears = {"Lovelace": 1882,
                      "Darwin": 1809,
                      "Noether": 1882}
#Tipp: innerhalb von Klammern können Zeilen umgebrochen werden
```

```
In [44]: #Position mit Wert ausgeben lassen:
authors_birthYears["Darwin"]
```

```
Out[44]: 1809
```

6) for-Schleife:

```
In [45]: #Dictionary:
names = ["Lovelace",
         "Darwin",
         "Curie",
         "Hawking"]
```

```
In [46]: #for-Schleife:
for name in names:
    print(name)
```

```
Lovelace
Darwin
Curie
Hawking
```

```
In [47]: #Schleife mit angesetztem String:
for name in names:
    print(name + " did awesome stuff")
```

```
Lovelace did awesome stuff
Darwin did awesome stuff
Curie did awesome stuff
Hawking did awesome stuff
```

```
In [48]: #Bindestriche sind Teil der Schleife (mehrfache Ausgabe):
for name in names:
    print(name + " did awesome stuff")
    print("-----")
```

```
Lovelace did awesome stuff
-----
Darwin did awesome stuff
-----
Curie did awesome stuff
-----
Hawking did awesome stuff
-----
```

```
In [49]: #Bindestriche sind nicht mehr Teil der Schleife (einfache Ausgabe):  
for name in names:  
    print(name + " did awesome stuff")  
print("-----")
```

```
Lovelace did awesome stuff  
Darwin did awesome stuff  
Curie did awesome stuff  
Hawking did awesome stuff  
-----
```

6.1) Dictionaries mit for-Schleife verbinden:

```
In [50]: #Dictionary anlegen:  
authors_birthYears = {"Lovelace": 1882,  
                      "Darwin": 1809,  
                      "Noether": 1882}
```

```
In [51]: #Keys ansehen:  
authors_birthYears.keys()
```

```
Out[51]: dict_keys(['Lovelace', 'Darwin', 'Noether'])
```

```
In [52]: for author in authors_birthYears.keys():  
         print(author)
```

```
Lovelace  
Darwin  
Noether
```

```
In [53]: for author, birthYear in authors_birthYears.items():  
         print(author + " was born in " + str(authors_birthYears[author]))
```

```
Lovelace was born in 1882  
Darwin was born in 1809  
Noether was born in 1882
```

7) Bedingte Anweisungen (Conditionals)

```
In [54]: temp = 20  
if temp > 15:  
    print ("It's warm")
```

```
It's warm
```

```
In [55]: #Ausgabe funktioniert, da:  
20 > 15
```

```
Out[55]: True
```

```
In [56]: #1 Bedingung:  
temp = 10  
if temp > 15:  
    print ("It's warm")
```

```
In [57]: #Ausgabe funktioniert nicht, da:  
10 > 15
```

Out[57]: False

```
In [58]: #2 Bedingungen:  
temp = 20  
if temp > 15:  
    print ("It's warm")  
else:  
    print("It's cold")
```

It's warm

```
In [59]: #2 Bedingungen:  
temp = 10  
if temp > 15:  
    print ("It's warm")  
else:  
    print("It's cold")
```

It's cold

```
In [60]: #3 Bedingungen:  
temp = 20  
if temp >= 25:  
    print("It's hot")  
elif temp > 15:  
    print ("It's warm")  
else:  
    print("It's cold")  
  
#elif = kurz für "else if"
```

It's warm