

lektion1

October 11, 2018

1 Lektion 1

1.1 Rechnen in Python

```
In [1]: 1+3
```

```
Out[1]: 4
```

```
In [2]: 2*3+3
```

```
Out[2]: 9
```

```
In [3]: 27/4      # Division
```

```
Out[3]: 6.75
```

```
In [4]: 27//4     # ganzzahlige Division
```

```
Out[4]: 6
```

```
In [5]: 27 % 4    # modulo
```

```
Out[5]: 3
```

```
In [6]: 2**3      # Potenz
```

```
Out[6]: 8
```

1.2 Variablen

1.2.1 Zahlen (ups, das hatte ich in der Vorlesung übersprungen)

```
In [7]: a_ganze_zahl = 2
```

```
In [8]: b_gleitkomma_zahl = 3.  
        type(b_gleitkomma_zahl)
```

```
Out[8]: float
```

```
In [9]: a = 2  
        b = 3  
        a*b
```

```
Out[9]: 6
```

```
In [10]: c = a*b/5  
         print(c)
```

1.2

```
In [11]: 1+1j      # imaginaere Einheit 'i' ist 'j'
```

```
Out[11]: (1+1j)
```

1.2.2 Zeichenketten (engl. strings)

```
In [12]: txt_var = 'Hallo, Welt.'  
         txt_var
```

```
Out[12]: 'Hallo, Welt.'
```

```
In [13]: txt_var_2 = 'Hello, world!'  
         txt_var_2
```

```
Out[13]: 'Hello, world!'
```

```
In [14]: print(txt_var, txt_var_2)
```

Hallo, Welt. Hello, world!

```
In [15]: txt_var[0::2]
```

```
Out[15]: 'Hlo et'
```

```
In [16]: txt_var[-5]
```

```
Out[16]: 'W'
```

1.3 Listen (engl. list)

```
In [17]: leere_liste = list()  
         leere_liste
```

```
Out[17]: []
```

```
In [18]: noch_eine_leere_liste = []  
         noch_eine_leere_liste
```

```
Out[18]: []
```

```
In [19]: liste_mit_nullen = [0,1] * 5  
         liste_mit_nullen
```

```
Out[19]: [0, 1, 0, 1, 0, 1, 0, 1, 0, 1]
```

```
In [20]: liste_mit_nullen
```

```
Out[20]: [0, 1, 0, 1, 0, 1, 0, 1, 0, 1]
```

```
In [21]: leere_liste.append(1)
```

```
In [22]: print(leere_liste)
```

```
[1]
```

```
In [23]: leere_liste.append('doc')
```

```
print(leere_liste)
```

```
[1, 'doc']
```

```
In [24]: len(leere_liste)
```

```
Out[24]: 2
```

1.3.1 Zugriff auf Elemente einer Liste (Indexzugriff)

```
In [25]: liste = [0,1,2,3,4,5,6,7]
```

```
liste
```

```
Out[25]: [0, 1, 2, 3, 4, 5, 6, 7]
```

```
In [26]: liste[4]
```

```
Out[26]: 4
```

```
In [27]: liste[4:7]
```

```
Out[27]: [4, 5, 6]
```

```
In [28]: liste[0:4:2]
```

```
Out[28]: [0, 2]
```

Indexzugriff auf Listen

```
In [29]: liste[-2]
```

```
Out[29]: 6
```

```
In [30]: liste[::-1]
```

```
Out[30]: [7, 6, 5, 4, 3, 2, 1, 0]
```

```
In [31]: liste_von_listen = [[1,2],[3,4]]
```

```
liste_von_listen
```

```
Out[31]: [[1, 2], [3, 4]]
```

```
In [32]: liste_von_listen[1][1]
```

```
Out[32]: 4
```

1.4 Dictionaries (Wörterbücher)

```
In [33]: leeres_dict = dict()
         leeres_dict
```

```
Out[33]: {}
```

```
In [34]: noch_ein_leeres_dict = {}
```

```
In [35]: ein_dict = {2: "Hallo ", 3: 'Donald'} # Schlüssel-Werte Paare
```

```
In [36]: ein_dict[2] + ein_dict[3] + '!'
```

```
Out[36]: 'Hallo Donald!'
```

.. Dictionaries

```
In [37]: ein_dict = {2: "Hallo ", 3: 'Donald'}
```

```
In [38]: ein_dict['s'] = '43'
         ein_dict
```

```
Out[38]: {2: 'Hallo ', 3: 'Donald', 's': '43'}
```

```
In [39]: print(ein_dict)
```

```
{2: 'Hallo ', 3: 'Donald', 's': '43'}
```

```
In [40]: del ein_dict[3]
```

```
In [41]: print(ein_dict)
```

```
{2: 'Hallo ', 's': '43'}
```

```
In [42]: ein_dict['s']
```

```
Out[42]: '43'
```

1.5 Tupel

```
In [43]: leeres_tupel = ()
         leeres_tupel
```

```
Out[43]: ()
```

```
In [44]: lt = tuple()
         lt
```

```
Out[44]: ()
```

```
In [45]: tp = ('tupel', 'lassen', 'sich', 'nicht', 'aendern')
         tp
Out[45]: ('tupel', 'lassen', 'sich', 'nicht', 'aendern')
In [46]: tp[0] = 'Tupel'
```

```
-----

TypeError                                Traceback (most recent call last)

<ipython-input-46-f8c8d74a202d> in <module>
----> 1 tp[0] = 'Tupel'

TypeError: 'tuple' object does not support item assignment
```

1.6 Mengen

```
In [47]: leere_menge = set()
         leere_menge
Out[47]: set()
In [48]: staedte = {'Duesseldorf', 'Berlin', 'Muenchen', 'Schalke', "Dortmund"}
In [49]: 'Berlin' in staedte
Out[49]: True
In [50]: staedte2 = {'Berlin', 'Hamburg'}
In [51]: staedte | staedte2 # Vereinigung
Out[51]: {'Berlin', 'Dortmund', 'Duesseldorf', 'Hamburg', 'Muenchen', 'Schalke'}
```

1.7 Kopieren

```
In [52]: a=1
         a
Out[52]: 1
In [53]: b=a
         b
Out[53]: 1
In [54]: b=2
         b
Out[54]: 2
In [55]: a
Out[55]: 1
```

1.8 Kopieren II

```
In [56]: a1 = [1,[2, 3]]
```

```
In [57]: b1 = a1
```

```
In [58]: b1[1][0] = "Hallo"
```

```
In [59]: a1
```

```
Out[59]: [1, ['Hallo', 3]]
```

```
In [60]: c1= a1[:]
         c1
```

```
Out[60]: [1, ['Hallo', 3]]
```

```
In [61]: c1[0] = 42
         c1
```

```
Out[61]: [42, ['Hallo', 3]]
```

```
In [62]: a1
```

```
Out[62]: [1, ['Hallo', 3]]
```

```
In [63]: c1[1][0] = 2018
         c1
```

```
Out[63]: [42, [2018, 3]]
```

```
In [64]: a1
```

```
Out[64]: [1, [2018, 3]]
```

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fett mit Sternchen oder fett mit Underscore
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