Python-Beispiele zu FProg

Kapitel 2: Kontrollstrukturen und Funktionen

Programmstrukturierung

```
x = 2; y = 7
if x < y :
   print ("x ist kleiner")
   x = y

if y % 2 == 0:
   print("Zahl gerade")
else:
   print("Zahl ungerade")
```

Datei celsius.py

Mehrere Bedingungen

Datei schaltjahr.py

Schleifen

Schleifen mit for

```
for i in [1,2,3]:
   print("Zahl:“,i)
for c in "Hallo“:
   print("Buchstabe:“, c)
for e in (1, ‘a’, [1,2,3], “Blumentopf”) :
   print(“Element:”, e)
```

Datei lotto.py

List Comprehension

```
b = [i**2 for i in range(0,10) if i%2 == 0]
b

c = [(i,j) for i in range(1,5) if i%2 == 0
        for j in range(1,5) if j%2!=0]
c

noprimes = [j for i in range(2, 8) for j in range(i*2, 100, i)]
primes = [x for x in range(2, 100) if x not in noprimes]
print(primes)
```

Funktionen

```
def hello():
   print ("Hello World!“)
hello()

a = "abra“
def func():
   a = 42
func()
a
```

Namensraum (Scope)

```
def modify(y):
      y = [j*j for j in y]
li = [1,2,3]
modify(li)

li
Out[38]: [1, 2, 3]
def mod2(y):
      for i, x in enumerate(y):
            y[i] = x*x
mod2(li)
li
Out[41]: [1, 4, 9]

x = 10
def func():
      print(x)
      x += 1
func()
def func2():
      global x
      print(x)
      x += 1
func2()
10
func2()
11
```

Parameterübergabe

```
def s(x, *tup):
      s = x
      for i in tup: s += i
      return s
s(3, 1,2,5)
Out[51]: 11
s(3)
```

Out[52]: 3
s(1,1,1,1,1,1,1,1)
Out[53]: 8

```
def m(x, **lex):
    s = x
    for j in lex: s += lex[j]
    print("lex:", lex)
    return s
m(0, a= 3, b = 44)
```
lex: {'a': 3, 'b': 44}
Out[55]: 47
```
m(-1, x = 17, y = 4)
m(-1, p = 17, q = 4)
```
lex: {'p': 17, 'q': 4}
Out[57]: 20

Anonyme Funktionen

```
li = [lambda x : x+n for n in range(10)]
print([j(3) for j in li])

#besser
lo = [(lambda k : lambda x : x+k)(n) for n in range(10)]
print([j(3) for j in lo])
```

Datei lambda.py

map und filter

```
l = range(10)
m = list(map(lambda x: x*x+1, l))
print(m)

m = list(filter(lambda x: x%2 == 0, l))
print(m)
```

Generatoren

Datei generator.py

Iteratoren

```
lst = [1, 2, 3, 4, 5]
it = iter(lst)
while True: print(next(it))
```