Python Cheat Sheet

by Roger Wattenhofer

Math

```python
a = 10 // 3        # a = 3 (integer division)
b = 10 % 3         # b = 1 (remainder of division)
c = 10 / 3         # c = 3.3333333333333335 (automatic float)
d = (3 * 0.1) == 0.3   # d = False (floats are not exact!)
e = 2 ** 1000      # (power results in big number? no problem!)
1 + 1              # = 2 (interactive: use _ for last result)
```

Strings & Lists

```python
a = 'abcdefgh'
a = len(a)                      # a = 8
b = a[0]                        # b = 'a'
c = a[-1]                       # c = 'h'
d = a[1:3]                      # d = 'bc' (slicing)
e = a[3::-1]                    # e = 'defg'
f = a[3:-1:2]                   # f = 'df'
g = a[::-1]                     # g = 'hgfedcba'

x = list(range(5))             # x = [0, 1, 2, 3, 4] (range: lazy)
y = [3, 5, 8]                  # y = [3, 5, 8] (direct construction)
x = [i*i for i in range(1,6)]  # x = [1, 4, 9, 16, 25] (list compr.)
x.append(77)                   # (appending element to list)
x.extend([88,99])              # (extending list with another list)
```

Sets & Dictionaries

```python
a = set([2,1,3,2,1])
a.add(4); a.remove(2)          # a = {1, 3, 4}
print(3 in a)                  # = True

d = {'alice': 24, 'bob': 22, 'charlie': 23}   # (Dictionary)
d['eve'] = 26                  # (add or change entry)
v = d.pop('charlie',None)      # v = 23 (remove)
```

Control

```python
if 2*x < y or x > 2*y:         # if, elif, else as usual
    print("far")               # no braces but indents
elif x == y:
    print("equal")
else:
    print("near")


for item in d:                 # traverse keys (also: list, set)
    for i in range(len(d)):    # traverse over indexes
        for i, item in enumerate(d):   # both index and item
            break              # break current loop


while x > 3:                   # while loops as usual
    print(x)
    x -= 1                     # x = x - 1


print("hello") if x == 5 else print("x =",x)   # cond. expression
```

Functions

```python
def square(x):                 # function definition
    return x*x                 # with return value


f = lambda x : x*x             # lambda is one line function
print(f(5))                    # = 25
l = [i*i for i in range(1,4)]
l.sort(key=lambda v : v % 10)  # l = [1, 4, 25, 16, 9]
```

Scope

```python
a = y = x = 1          # globally: set all = 1

def foo():
    global x           # keyword global: global x is used
    x, y = 2, 2        # x is global, y is local, x is unchanged
    print(x,y,x)       # = 2 2 1 (x is accessible)

foo()
print(x,y,x)           # = 2 1 1 (note that global y was unchanged)
```

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