

Python

...für Anfänger

Unit 3

by

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Division mit Rest in \mathbb{N}

Division

```
>>> 8 // 2
```

```
4
```

```
>>> 7 // 2
```

```
3
```

Modulo

```
>>> 8 % 2
```

```
0
```

```
>>> 7 % 2
```

```
1
```

Division mit Rest in \mathbb{Z}

Division

```
>>> 7 // 3
```

```
2
```

```
>>> -7 // 3
```

```
-3
```

```
>>> 7 // -3
```

```
-3
```

```
>>> -7 // -3
```

```
2
```

Modulo

```
>>> 7 % 3
```

```
1
```

```
>>> -7 % 3
```

```
2
```

```
>>> 7 % -3
```

```
-2
```

```
>>> -7 % -3
```

```
-1
```

Namen

```
>>> r
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
NameError: name 'r' is not defined
>>> r = 3
>>> r
3
>>> import math
>>> 2 * r * math.pi
6.283185307179586
```

input

```
>>> r = input("Radius= ")
```

```
Radius= 2
```

```
>>> 2 * r * math.pi
```

```
Traceback (most recent call last):
```

```
  File "<stdin>", line 1, in <module>
```

```
TypeError: can't multiply sequence by non-int of ty
```

```
>>> r
```

```
'2'
```

```
>>> 2 * int(r) * math.pi
```

```
12.566370614359172
```

abs

```
>>> x = 1
>>> abs(x)
1
>>> x = -2
>>> abs(x)
2
>>> x = 0
>>> abs(0)
0
```

Funktionen vs. Prozedur

```
>>> a = math.sqrt(4)
>>> a
2.0
>>> x = print(2)
2
>>> x
>>> print(x)
None
```

Objekt

```
>>> name = "Maxi"  
>>> type(name)  # Typ  
<class 'str'>  
>>> id(name)    # Identitdät  
3068043648  
>>> # Zustand eines Strings  
>>> name + "!"  # Verhalten  
'Maxi!'
```


Typen

Jedes Objekt hat einen Typ!

```
>>> type(None)
<class 'NoneType'>
>>> type(print)
<class 'builtin_function_or_method'>
>>> type(2)
<class 'int'>
>>> type(int)
<class 'type'>
>>> int
<class 'type'>
>>> type(type)
<class 'type'>
```

Vertauschung mittels Hilfsvariable

```
>>> a = 1
>>> b = 2
>>> c = a
>>> a = b
>>> b = c
>>> a
2
>>> b
1
```

Vertauschung ohne Hilfsvariable

?

Vertauschung ohne Hilfsvariable

?

```
>>> a = 1
```

```
>>> b = 2
```

```
>>> a = a + b
```

```
>>> b = a - b
```

```
>>> a = a - b
```

```
>>> a
```

```
2
```

```
>>> b
```

```
1
```