Python
...für Anfänger

Unit 14

by

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21. Juli 2015

Bitoperationen - 4

```
>>> ~4  # ~x = -(x + 1)
-5
>>> ~-5
4
>>> ~0
-1
>>> ~-1
0
>>> x = int(input("eine ganze zahl: "))
eine ganze zahl: 767
>>> ~~x
767
```

Bitoperationen - 5

```
>>> bin(12)
'0b1100'
>>> 12 << 1
24
>>> bin(24)
'0b11000'
>>> 12 << 2
48
>>> bin(48)
'0b110000'
```

Bitoperationen - 6

```
>>> 12 >> 1
6
>>> bin(6)
'0b110'
>>> 12 >> 2
3
>>> bin(6)
'0b11'
>>> 12 >> 3
1
>>> 12 >> 4
0
>>> 12 >> 5
0
```

Bitoperationen - 7

```
>>> p = 0b0101
>>> bin(1 << 3)
'0b1000'
>>> p = p | (1 << 3)  # setzen eines Bits
>>> bin(p)
'0b1101'
>>> bin(p & (1 << 3))
'0b1000'
>>> bool(p & (1 << 3))  # abfragen eines Bits
True
```

Bitoperationen - 8

```
>>> def mask(p, pos):
...     """Return deletion mask for given position"
...     return 1 << pos ^ (1 << p.bit_length()) - 1
...
>>> p = 0b1101
>>> bin(mask(p, 0))
'0b1110'
>>> bin(mask(p, 1))
'0b1101'
>>> bin(mask(p, 2))
'0b1011'
>>> bin(mask(p, 3))
'0b111'
```

Bitoperationen - 9

```
>>> bin(p & mask(p, 2))
'0b1101'
>>> p = p & mask(p, 2)  # löschen eines Bits
>>> bin(p)
'0b1001'
>>> p = p & mask(p, 1)
>>> bin(p)
'0b1001'
>>> p = p | (1 << 0)
>>> bin(p)
'0b1001'
```