# Arithmetic Operator

In [1]:
```
x1,y1=10,5
```

In [10]:
```
x1
```

Out[10]: 10

In [2]:
```
x1+y1
```

Out[2]: 15

In [3]:
```
x1-y1
```

Out[3]: 5

In [4]:
```
x1*y1
```

Out[4]: 50

In [5]:
```
x1/y1
```

Out[5]: 2.0

In [6]:
```
x1//y1
```

Out[6]: 2

In [7]:
```
x%y
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[7], line 1
----> 1 x%y

NameError: name 'x' is not defined
```

In [8]:
```
x1%y1
```

Out[8]: 0

In [9]:
```
x1**y1
```

Out[9]: 100000

In [11]:
```
x2=3
y2=3
x2**y2
```

Out[11]: 27

# Assignment Operator

In [12]:
```
x=2
x=x+2
```

In [13]:
```
x
```

Out[13]: 4

In [14]:
```
x+=2
```

In [15]:
```
x
```

Out[15]: 6

In [16]:
```
x+=2
x
```

Out[16]: 8

In [17]:
```
x*=2
x
```

Out[17]: 16

In [18]:
```
x-=2
x
```

Out[18]: 14

In [19]:
```
x/=2
```

In [20]:
```
x
```

Out[20]: 7.0

In [21]:
```
x//=2
x
```

Out[21]: 3.0

# swapping two elements

In [22]:
```
a,b=5,6
print(a)
print(b)
```

```
5
6
```

In [23]:
```
a=5
b=6
print(a)
print(b)
```

```
5
6
```

In [24]:
```
a
```

Out[24]: 5

In [25]:
```
b
```

Out[25]: 6

In [26]:
```
a=5
b=6
```

In [27]:
```
a=b
b=a
```

In [28]:
```
print(a)
print(b)
```

```
6
6
```

In [29]:
```
a1=7
b1=8
```

In [30]:
```
temp = a1
a1=b1
b1=temp
```

In [32]:
```
print(a1)
print(b1)
```

```
8
7
```

In [34]:
```
a9=2
b9=4
```

In [35]:
```
print(a9)
print(b9)
```

```
2
4
```

In [37]:
```
mon=a9
a9=b9
b9=mon
```

In [38]:
```
print(a)
print(b)
```

```
6
6
```

# swapping without using third variable

In [41]:
```
a2=5
b2=6
```

In [42]:
```
a2=a2+b2
b2=a2-b2
a2=a2-b2
```

In [43]:
```
print(a2)
print(b2)
```

```
6
5
```

# unary operator

In [44]:
```
n=7
n
```

Out[44]: 7

In [45]:
```
m=-(n)
```

In [46]:
```
m
```

Out[46]: -7

In [47]:
```
n
```

Out[47]: 7

In [48]:
```
-n
```

Out[48]: -7

In [49]:
```
m
```

Out[49]: -7

In [50]:
```
n
```

Out[50]: 7

In [51]:
```
m=7
```

In [52]:
```
m
```

Out[52]: 7

In [53]:
```
m=-7
```

In [54]:
```
m
```

Out[54]: -7

In [55]:
```
m=-(n)
m
```

Out[55]: -7

# Relational operator

In [57]:
```
a=5
b=6
```

In [58]:
```
a<b
```

Out[58]: True

In [59]:
```
a>b
```

Out[59]: False

In [60]:
```
a==b
```

Out[60]: False

In [61]:
```
a!=b
```

Out[61]: True

In [62]:
```
b=5
```

In [63]:
```
a==b
```

Out[63]: True

In [64]:
```
a
```

Out[64]: 5

In [65]:
```
b
```

Out[65]: 5

In [66]:
```
a>b
```

Out[66]: False

In [67]:
```
a>=b
```

Out[67]: True

In [68]:
```
a<=b
```

Out[68]: True

In [69]:
```
a<b
```

Out[69]: False

In [70]:
```
a>b
```

Out[70]: False

In [71]:
```
b=7
```

In [72]:
```
a!=b
```

Out[72]: True

# Logical Operators

In [73]:
```
a=5
b=4
```

In [74]:
```
a<8 and b<5
```

Out[74]: True

In [75]:
```
a<8 and b<2
```

Out[75]: False

In [76]:
```
a<b and b<a
```

Out[76]: False

In [77]:
```
a>b and b<a
```

Out[77]: True

In [78]:
```
a<8 or b<2
```

Out[78]: True

In [79]:
```
a>8 or b<2
```

Out[79]: False

In [80]:
```
x=False
x
```

Out[80]: False

In [81]:
```
not x
```

Out[81]: True

In [82]:
```
x= not x
x
```

Out[82]: True

In [83]:
```
not x
```

Out[83]: False

# Number system conversation (bit-binary digit)

In [84]:
```
25
```

Out[84]: 25

In [85]:
```
bin(25)
```

Out[85]: '0b11001'

In [86]:
```
int(0b11001)
```

Out[86]: 25

In [87]:
```
bin(30)
```

Out[87]: '0b11110'

In [88]:
```
int(0b11110)
```

Out[88]: 30

In [91]:
```
int(0b11001)
```

Out[91]: 25

In [92]:
```
oct(25)
```

Out[92]: '0o31'

In [93]:
```
int(0o31)
```

Out[93]: 25

In [94]:
```
int(0o31)
```

Out[94]: 25

In [95]:
```
int(0b11110)
```

Out[95]: 30

In [96]:
```
0o31
```

Out[96]: 25

In [97]:
```
0b11110
```

Out[97]: 30

In [98]:
```
oct(0o25)
```

Out[98]: '0o25'

In [99]:
```
bin(30)
```

Out[99]: '0b11110'

In [100…
```
oct(25)
```

Out[100… '0o31'

In [101…
```
int(0o31)
```

Out[101… 25

In [102…
```
0o31
```

Out[102… 25

In [103…
```
0b11001
```

Out[103… 25

In [104…
```
int(11001)
```

Out[104… 11001

In [105…
```
bin(7)
```

Out[105… '0b111'

In [106…
```
bin(30)
```

Out[106… '0b11110'

In [107…
```
oct(25)
```

Out[107… '0o31'

In [108…
```
0o31
```

Out[108… 25

In [109…
```
int(0o31)
```

Out[109… 25

In [110…
```
hex(25)
```

Out[110… '0x19'

In [111…
```
int(0x19)
```
Out[111… 25

In [112…
```
0x19
```
Out[112… 25

In [113…
```
hex(16)
```
Out[113… '0x10'

In [114…
```
hex(19)
```
Out[114… '0x13'

In [115…
```
0xa
```
Out[115… 10

In [116…
```
0xb
```
Out[116… 11

In [117…
```
hex(1)
```
Out[117… '0x1'

In [118…
```
hex(25)
```
Out[118… '0x19'

In [119…
```
bin(7)
```
Out[119… '0b111'

In [120…
```
0x
```
```
  Cell In[120], line 1
    0x
     ^
SyntaxError: invalid hexadecimal literal
```

In [121…
```
oxa
```
```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[121], line 1
----> 1 oxa

NameError: name 'oxa' is not defined
```

In [122…
```
0xa
```
Out[122… 10

In [123…
```
0xb
```
Out[123… 11

In [124…
```
0xf
```
Out[124… 15

In [125…
```
0x16
```
Out[125… 22

In [126…
```
0xab
```
Out[126… 171

In [127…
```
 hex(16)
```
Out[127… '0x10'

In [128…
```
hx(22)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[128], line 1
----> 1 hx(22)

NameError: name 'hx' is not defined
```

In [129…
```
hex(22)
```
Out[129… '0x16'

In [130…
```
hex(28)
```
Out[130… '0x1c'

In [131…
```
0x1d
```
Out[131… 29

In [132…
```
hex(30)
```
Out[132… '0x1e'

In [133…
```
hex(0x1f)
```
Out[133… '0x1f'

In [134…
```
int(0x1f)
```
Out[134… 31

In [135…
```
hex(32)
```
Out[135… '0x20'

In [136…
```
int(0x20)
```
Out[136… 32

In [137…
```
hex(26)
```
Out[137… '0x1a'

In [138…
```
0x19
```
Out[138… 25

In [139…
```
ox15
```
```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[139], line 1
----> 1 ox15

NameError: name 'ox15' is not defined
```

In [140…
```
0x15
```
Out[140… 21

In [141…
```
0b110
```
Out[141… 6

In [142…
```
0b101
```
Out[142… 5

In [143…
```
print(0b110)
print(0b101)
```
```
6
5
```

In [144…
```
print(bin(11))
print(0b1011)
```
```
0b1011
11
```

In [145…
```
print(a2)
print(b2)
```
```
6
5
```

In [146…
```
a2=a2^b2
b2=a^b2
a2=a2^b2
```

In [147…
```
print(a2)
print(b2)
```

```
3
0
```

In [148…
```
a2=6
b2=5
```

In [150…
```
print(a2)
print(b2)
```

```
6
5
```

In [151…
```
a2,b2=b2,a2
```

In [152…
```
print(a2)
print(b2)
```

```
5
6
```

In [153…
```
print(bin(12))
print(bin(13))
```

```
0b1100
0b1101
```

# Complement

In [154…
```
~12
```

Out[154…
```
-13
```

In [155…
```
~46
```

Out[155…
```
-47
```

In [156…
```
~54
```

Out[156…
```
-55
```

In [157…
```
~10
```

Out[157…
```
-11
```

# Bitwise Operator

In [158…
```
12&13
```

Out[158…
```
12
```

In [159…
```
12|13
```

Out[159…
```
13
```

In [160…
```
1|0
```
Out[160… 1

In [161…
```
bin(35)
```
Out[161… '0b100011'

In [162…
```
bin(13)
```
Out[162… '0b1101'

In [163…
```
print(bin(35))
print(bin(40))
```
```
0b100011
0b101000
```

In [164…
```
35 & 40
```
Out[164… 32

In [165…
```
bin(32)
```
Out[165… '0b100000'

In [167…
```
int(0b101011)
```
Out[167… 43

In [168…
```
35 | 40
```
Out[168… 43

In [169…
```
int(0b11110001)
```
Out[169… 241

In [170…
```
int(0b00000001)
```
Out[170… 1

In [172…
```
print(bin(25))
print(bin(30))
```
```
0b11001
0b11110
```

In [173…
```
int(0b00111)
```
Out[173… 7

In [174…
```
25^30
```
Out[174… 7

In [175…
```
bin(7)
```

Out[175… '0b111'

In [176…
```
bin(25)
```

Out[176… '0b11001'

In [177…
```
bin(30)
```

Out[177… '0b11110'

In [178…
```
bin(10)
```

Out[178… '0b1010'

In [179…
```
10<<1
```

Out[179… 20

In [180…
```
10<<2
```

Out[180… 40

In [181…
```
10<<3
```

Out[181… 80

In [182…
```
bin(20)
```

Out[182… '0b10100'

In [183…
```
20<<4
```

Out[183… 320

In [184…
```
bin(320)
```

Out[184… '0b101000000'

In [185…
```
bin(10)
```

Out[185… '0b1010'

In [186…
```
10>>1
```

Out[186… 5

In [187…
```
bin(5)
```

Out[187… '0b101'

In [188…
```
10>>2
```

Out[188… 2

In [189…
```
bin(2)
```

Out[189… '0b10'

In [190…
```
10>>3
```

Out[190… 1

In [191…
```
bin(1)
```

Out[191… '0b1'

In [192…
```
bin(20)
```

Out[192… '0b10100'

In [193…
```
20>>1
```

Out[193… 10

In [194…
```
bin(10)
```

Out[194… '0b1010'

In [195…
```
20>>2
```

Out[195… 5

In [196…
```
bin(5)
```

Out[196… '0b101'

In [197…
```
20>>3
```

Out[197… 2

In [198…
```
bin(2)
```

Out[198… '0b10'

In [ ]: