

Exercises:

1. Convert Binary Value 1100101 into Decimal
2. Convert float value 1234.675 into integer
3. Find floor & ceil values of 12.456 using math module
4. Find $4x^3$ where $x=3$
5. Find square root of 16
6. Find $5x^2+3x+4$ where $x=2$
7. Find Area of Square (set $a=18$)
8. Find Circumference of Circle (radius=12)
9. Find Area of Circle (radius = 5)
10. Convert Octal value 15 into Decimal value
11. Find $(18)_{10} = (?)_2$
12. Find $(18)_{10} = (?)_{16}$

EXPRESSION & OPERATORS

Expression:

Combination of Operators & Operands

Syntax:

Operand1 operator **Operand2**

Example:

$a + b$

$2 - 5$

EXPRESSION & OPERATORS

Operand : Value or Quantity

Operator : Symbol

Unary : Takes single operand
+5 , -2

Binary : Takes Two Operands

Expression may be

Simple : $2+5$

Complex : $2+5+(8-5)*2$

Types of Operators

1. Arithmetic
2. Relational or Comparison
3. Assignment
4. Bitwise
5. Membership
6. Identity
7. Logical

Arithmetic Operators

- | | |
|-------------------|----|
| 1. Addition | + |
| 2. Subtraction | - |
| 3. Multiplication | * |
| 4. Division | / |
| 5. Modulus | % |
| 6. Floor Division | // |
| 7. Exponent | ** |

Python 2.7.14rc1 Shell

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Python 2.7.14rc1 (v2.7.14rc1:c707893, Aug 26 2017, 23:59:08) [MSC v.1500 32 bit (Intel)

] on win32

Type "copyright", "credits" or "license()" for more information.

>>>

Ln: 3 Col: 4



Untitled



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Ln: 1 Col: 0

Arithmetic Operators

ar.py - C:/Python/Python36-32/ar.py (3.6.1)

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```
X,Y,Z=40,5,4  
  
print("Sum = ",(X+Y))  
  
print("Difference = ",(X-Y))  
  
print("Product = ",(X*Y))  
  
print("Quotient = ",(X/Y))  
  
print("Remainder = ",(X%Y))  
  
print("Exponent = ", (Y**2))  
  
print("Floor Division = ", (Y//Z))  
  
print("Unary Minus = ",-Z)
```

Ln: 10 Col: 0

Comparison Operators

1. Greater than >
2. Less than <
3. Equal to ==
4. Greater than or equal to >=
5. Less than or equal to <=
6. Not equal to !=

Comparison Operators

X,Y=40,5

```
print("Greater than = ",(X>Y))
```

```
print("Less than = ",(X<Y))
```

```
print("Equal to= ",(X==Y))
```

```
print("Not Equal to = ",(X!=Y))
```

```
print("Greater than or Equal to = ",(X>=Y))
```

```
print("Less than or Equal to = ",(X<=Y))
```

Assignment Operators

- | | |
|-----------------------|-----|
| 1. Assignment | = |
| 2. Add AND | += |
| 3. Subtract AND | -= |
| 4. Multiply AND | *= |
| 5. Divide AND | /= |
| 6. Modulus AND | %= |
| 7. Exponent AND | **= |
| 8. Floor Division AND | //= |

Ex: **x+=1** x=x+1

X=10

Z=5

Z+=X

print("Add AND = " , Z)

Z-=X

print("Subtract AND = " , Z)

Z*=X

print("Multiply AND = " , Z)

Z/=X

print("Divide AND = " , Z)

Z=2

Z%=X

print("Modulus AND = " , Z)

Z**=2

print("Exponent AND = " , Z)

Z//=X

print("Floor Division AND = " , Z)

Bitwise Operators

1. Bitwise AND	&	a&b
2. Bitwise OR		a b
3. Bitwise Complement	~	~a
4. Bitwise XOR	^	a^b
5. Left Shift	<<	a<<n
6. Right Shift	>>	a>>n

Bitwise OR		
Input1	Input2	Output
0	0	0
0	1	1
1	0	1
1	1	1

Bitwise AND		
Input1	Input2	Output
0	0	0
0	1	0
1	0	0
1	1	1

Bitwise XOR		
Input1	Input2	Output
0	0	0
0	1	1
1	0	1
1	1	0

Bitwise Complement	
Input	Output
0	1
1	0

Bitwise OR

x=9, y=8

x 0000 1001

y 0000 1000

x | y 0000 1001

Left Shift

x=4 0000 0100

x<<1 0000 1000

x<<1 0000 0100

Right Shift

x=4 0000 0100

x>>1 0000 0010

```
X ,Y ,Z =4, 9, 0
```

```
Z= X & Y
```

```
print(" Bitwise AND =" , Z)
```

```
Z= X | Y
```

```
print(" Bitwise OR =" , Z)
```

```
Z= X ^ Y
```

```
print(" Bitwise XOR =" , Z)
```

```
Z= ~6
```

```
print(" Bitwise Complement =" , Z)
```

```
Z= 4<<2
```

```
print(" Bitwise Left shift =" , Z)
```

```
Z= 9>>2
```

```
print(" Bitwise Right shift =" , Z)
```


Sum= 45

Difference = 35

Product 200

Qotient = 8.0

Remainder = 0

Exponent = 25

Floor Division = 1

Unary Minus = -4

Greater than = True

Less than = False

Equal to= False

Not Equal to = True

Greater than or Equal to = True

Less than or Equal to = False

Add AND = 15

Subtract AND = 5

Multiply AND = 50

Divide AND = 5.0

Modulus AND = 2

Exponent AND = 4

Floor Division AND = 0

Bitwise AND = 0

Bitwise OR = 13

Bitwise XOR = 13

Bitwise Complement = -7

Bitwise Left shift = 16

Bitwise Right shift = 2

Logical Operators

Used to check more than one conditions

To evaluate logical operations

1. Logical And and
2. Logical Or or
3. Logical Not not

Program:

```
X,Y = 10,10
print((X>=Y) and (X==Y))
X,Y=10,5
print((X>Y) and (Y>X))
print((not(X>Y))
```

Output:

```
True
False
True
```

Logical or		
Input1	Input2	Output
False	False	False
False	True	True
True	False	True
True	True	True

Logical and		
Input1	Input2	Output
False	False	False
False	True	False
True	False	False
True	True	True

Logical not	
Input	Output
True	False
False	True

Membership Operators

To check whether a value present in a sequence or not

1. In 2. not in

Return true or false values

Program:

```
X='United'  
print("t" in X)  
Y=[12,77,88,100,33]  
Z= 77 in Y  
print(Z)  
Z=12 not in Y  
print(Z)
```

Output:

```
True  
True  
False
```

Identity Operators

1. To compare the memory locations (same or not) of two objects

Operators are : `is` , `is not`

Return true or false values

Program:

```
X ,Y, Z = 15,15,10
```

```
print(X is Y)
```

```
print(X is Z)
```

```
print(X is not Z)
```

Output

```
True
```

```
False
```

```
True
```

```
>>> x=10
>>> y=10
>>> print(id(x)," ",id(y))
1364420880    1364420880
>>> print(x is y)
True
>>>
```

```
>>> x,y=10,20
>>> print(id(x)," ",id(y))
1364420880    1364421040
>>> print(x is y)
False
>>>
```