```
>>> n1=0xt
SyntaxError: invalid hexadecimal literal
>>> n2=0XFF
>>> n2
255
>>> a=0xb
>>> b=0xc
>>> a+b
23
>>> x=0x1a
>>> y=0x1b
>>> x+y
53
>>> m=1a
SyntaxError: invalid decimal literal
```

Octal Integer

An integer value with base 8 called octal integer
This integer value is created using digits range from 0-7
This integer value is prefix with 0o OR 0O

In application development octal integers are used
1. Assembly Language
2. Operating Systems (File Permissions)
3. Networking

```
>>> a=0o78
SyntaxError: invalid digit '8' in octal literal
>>> b=0o25
>>> b
21
```

Decimal to Octal	Octal to Decimal
$(25)_{10} \longrightarrow (0031)_8$	$(0031)_8 \xrightarrow{10} (25)_{10}$

```
8 | 25
8 | 3  | 1
     | 3
```

$8^0 \times 1 + 8^1 \times 3$

$1 + 24 = 25$

Binary Integer

An integer value with base 2 is called binary integer

This integer value is created using 0's and 1's

This integer value is prefix with 0b or 0B

In application development binary integer is used

1. Embedded Applications
2. Machine Language

```
>>> n1=0b12
SyntaxError: invalid digit '2' in binary literal
>>> n2=0b1010
>>> n2
10
>>> n3=0B1100
>>> n3
12
```

| Decimal to Binary | Binary to Decimal |

$(12)_{10}$ ———————— $(0b1100)_2$ $(0b1100)_2$ ———————— $(12)_{10}$

```
2 | 12
2 |  6    0
2 |  3    0
2 |  1    1
        1
```

$2^0 \times 0 + 2^1 \times 0 + 2^2 \times 1 + 2^3 \times 1$

$0+0+4+8 = 12$

Base Conversion functions

1. oct() : returns octal value
   Syntax: oct(value)
2. hex() : returns hexadecimal value
   Syntax: hex(value)
3. bin() : returns binary value
   Syntax: bin(value)

```
>>> a=oct(25)
>>> a
'0o31'
>>> b=oct(0xb)
>>> b
'0o13'
>>> c=oct(0b1100)
>>> c
'0o14'
>>> d=hex(10)
>>> d
'0xa'
```

```
>>> e=hex(255)
>>> e
'0xff'
>>> f=hex(0b1100)
>>> f
'0xc'
>>> g=bin(12)
>>> g
'0b1100'
>>> h=bin(0xb)
>>> h
'0b1011'
>>> i=bin(0o12)
>>> i
'0b1010'

>>> a=99999999999999999999999999999999999999999
>>> a
99999999999999999999999999999999999999999
>>>
b=99999999999999999999999999999999999999999999999999999999
999
>>> b
99999999999999999999999999999999999999999999999999999999999
9
```

Size of int data type in python is dynamic. Python runtime system reserve space based on value size.

```
>>> type(a)
<class 'int'>
>>> b=0x12
```

```
>>> type(b)
<class 'int'>
>>> c=0o12
>>> type(c)
<class 'int'>
```

Float data type and float literal

What is float literal or value?
A float value is numeric value with decimal part or fractional part.

Float data type in python is used to represent float value in memory.
In python float value is represented into 2 formats

1. fixed notation
2. scientific notation or exponent notation

```
>>> x=1.5
>>> type(x)
<class 'float'>
>>> y=0b101.110
SyntaxError: invalid syntax
>>> y=15e-1
>>> y
1.5
>>> z=1.2345e3
>>> z
1234.5
>>> p=1.23456789123456789
```

```
>>> p
1.234567891234568
```

The maximum number of decimal values allowed is 15

Complex data type and complex number

What is complex number?
A complex number is a numeric value with 2 values/parts
   1. real
   2. imaginary

Syntax: a+bj
a ☐ real
b ☐ imaginary
Imaginary value must suffix with "j"

```
>>> c1=1+2j
>>> type(c1)
<class 'complex'>
>>> c1.real
1.0
>>> c1.imag
2.0
>>> c2=1j
>>> c2.real
0.0
>>> c2.imag
1.0
>>> c1
(1+2j)
```

```
>>> c2
1j
```

Boolean data type and boolean literals

In python boolean values are represented using 2 keywords
1. True
2. False
"bool" class or data type represents boolean value in memory

```
>>> a=True
>>> type(a)
<class 'bool'>
>>> a
True
>>> b=False
>>> type(b)
<class 'bool'>
```

NoneType data type and None literal

None is keyword used to represent no value or null value in python
None value is represented in memory using NoneType

```
>>> rollno=123
>>> name=None
>>> type(rollno)
<class 'int'>
>>> type(name)
<class 'NoneType'>
>>> fee=None
```

```
>>> type(fee)
<class 'NoneType'>
```

Syntax of writing python program

C (POP)	Java(OOP)	Python

`void main()`
`{`
`printf("Hello C");`
`}`
	`class Program`
	`{`
	`public static void main(String args[])`
	`{`
	`System.out.println("Hello Java");`
	`}`
	`}`
		`print("Hello Python")`
		
		`def main():`
		`    print("Hello Python")`
		
		`class Program:`
		`    def main():`
		`        print("Hello Python")`

Python applications are developed using
1. Procedural oriented programming (functions)
2. Object oriented programming (classes)
3. Monolithic programming (sequentially)

Python is a multi paradigm programming language.

What is indent in python?
Space given at the beginning of the statement is called indent
In indentation is used for creating blocks.

Comments in python

What is comment?
Comment is information about program or each statement written inside program.
Comments are ignored by python translator or not executed

How to define comments in Python?
Using # (pound)

This sign used to represent single line comment

Example:
#room no
rno=1 #roomno

Example:
#room no
rno=1 #roomno

#a=10
#b=20
#c=30

Telegram: codewithsatishgupta

Day-1 https://youtu.be/mekcaUxCQWw
Day-2 https://youtu.be/HXhCrD7x8NM
Day-3 https://youtu.be/7lrFX9KpSNU
Day-4 https://youtu.be/6ewZ6Q3V3ZA
Day-5 https://youtu.be/ajiCXxV21OI
Day-6 https://youtu.be/Cbi9Oalmb7w