

Decimal Integer:-

- An integer value with base 10 is called decimal integer.
- This integer is created using all the digit from 0-9.
- This integer is not prefix with '0'.
- This integer is prefix with "+" or "-".
- Default format of integer values are in decimal format.

• >>> a = 0125

28/10/23

SyntaxError: leading zeros in decimal Integer literals are not permitted: use an '0o' prefix for octal integers.

$(125)_{10}$

$$\begin{aligned} &= 10^0 \times 5 + 10^1 \times 2 + 10^2 \times 1 \\ &= 5 + 20 + 100 \\ &= 125 \end{aligned}$$

- Integer is allowed only one special character - (underscore)
- Grouping digits are done using.
- cannot use as a prefix & suffix.

Ex: >>> amt1 = 1_500
1500

>>> amt2 = 1_500_000
150000

>>> amt3 = (-)50

SyntaxError. → invalid.

Before this we can't use (-) underscore

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Eg:- `>>> amt 4 = 100` → after value use can't use.
Syntax error: → not defined.

Octal Integer:-

An integer value with base 8 is called octal integer.

Octal integer is created using digits range from 0-7.

The integer is prefix with 0o or 0O.

↓
Zero & small 'o'

↓
Zero & capital 'O'

Application of Local integers:-

i) → Assembly lang / Embedded Applⁿ.

ii) → Represent an integer which doesn't allow digits 8 and 9.

Eg `>>> a = 0045`

`type(a)`

`<class 'int'>`

Eg `>>> b = 0089`

Syntax Error:- Invalid digit '8' in octal literal.

Eg `>>> c = 00278`

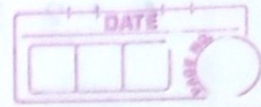
Syntax error:- Invalid digit '8' in octal literal.

Eg `>>> b = 0035`

`28`

Eg `>>> c = 00125`
`85`

GUI \rightarrow Graphical user Interface.
CUI \rightarrow Character user Interface.



Decimal to octal	octal to Decimal
$(85)_{10} \longrightarrow (00125)_8$	$(00125)_8 \longrightarrow (85)_{10}$
$ \begin{array}{r rr} 8 & 85 & \\ \hline 8 & 10 & 5 \\ \hline 8 & 1 & 2 \\ \hline & & 1 \end{array} $	$ \begin{aligned} &= 8^0 \times 5 + 8^1 \times 2 + 8^2 \times 1 \\ &= 5 + 16 + 64 \\ &= 85 \end{aligned} $

Hexadecimal Integer :-

- \rightarrow An Integer value with base 16 is called hexadecimal integer.
- \rightarrow This integer is created using 16 digits 0-9, a-f / A-F.
- \rightarrow This integer is prefix with 0x or 0X.
- \rightarrow Larger Integer values are represented in hexadecimal format.

Applications of hexadecimal integer.

- 1) Color values.
- 2) unicode characters.
- 3) Memory addresses.

Ex: $\Rightarrow n_1 = 0xa$
 $\Rightarrow n_1$
 $\Rightarrow 10$

Ex: $\Rightarrow n_2 = 0xb$
 $\Rightarrow n_2$
 $\Rightarrow 11$

Ex: $\Rightarrow n_3 = 0xf$
 $\Rightarrow n_3$
 $\Rightarrow 15$

0 1 2 3 4 5 6 7 8 9 a b c d e f

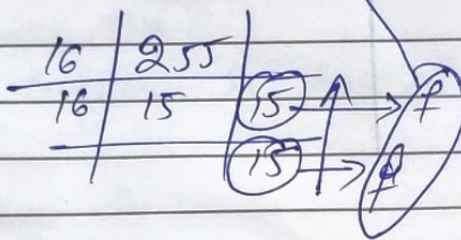
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eg: $\gg n_4 = 0x9$

Synt Error: invalid ~~dec~~ hexadecimal literal.

Decimal to hexadecimal

① $(255)_{10} \longrightarrow (0xFF)_{16}$



Hexadecimal to decimal

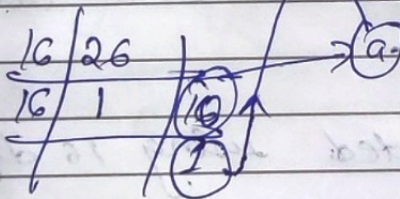
② $(0x1a)_{16} \longrightarrow (26)_{10}$

$$\frac{16^0 \times a}{1 \times 10} + \frac{16^1 \times 1}{16}$$

$$= 10 + 16$$

$$= 26$$

② $(26)_{10} \longrightarrow (0x1a)_{16}$



③ $(0x2f)_{16} \longrightarrow (47)_{10}$

$$= 16^0 \times f + 16^1 \times 2$$

$$= 1 \times 15 + 32$$

$$= 47$$

Binary Integer.

- An Integer value with base 2 is called binary Integer.
- Binary Integer is created using two digits 0 & 1.
- Binary Integer is prefix with 0b or 0B.