What is a Variable in Python?

A Python variable is a reserved memory location to store values. In other words, a variable in a python program gives data to the computer for processing.

Every value in Python has a datatype. Different data types in Python are Numbers, List, Tuple, Strings, Dictionary, etc. Variables can be declared by any name or even alphabets like a, aa, abc, etc

Variable Naming Rules in Python

1. Variable name should start with letter(a-zA-Z) or underscore (_).

Valid : age , _age , Age

Invalid : 1age

2.In variable name, no special characters allowed other than underscore (_).

Valid : age_ , _age

Invalid : age_*

3.Variables are case sensitive.

age and Age are different, since variable names are case sensitive.

4.Variable name can have numbers but not at the beginning.

Example: Age1

5.Variable name should not be a Python keyword.Keywords are also called as reserved words.

Example

pass, break, continue.. etc are reserved for special meaning in Python. So, we should not declare keyword as a variable name.

How to Declare and use a Variable

Let see an example. We will declare variable "a" and print it.

```
a=100
print (a)
```

Re-declare a Variable

You can re-declare the variable even after you have declared it once.

```
a=100
print(a)
a='AECS Jaduguda'
print(a)
```

Concatenate Variables

a='AECS'

b=1

print(a+b)

will throw error , as we cannot concatenate two different datatypes. But

a='AECS'

b=1

print(a+str(b))

will display

AECS1

Delete a variable

You can also delete variable using the command **del** "variable name".

The below table displays the list of available assignment operators in Python language.

ASSIGNMENT OPERATORS

=	x = 25	Value 25 is assigned to x
+=	x += 25	This is same as x = x + 25
-=	x -= 25	Same as x = x – 25
*=	x *= 25	This is same as x = x * 25
/=	x /= 25	Same as x = x / 25
%=	x %= 25	This is identical to x = x % 25
//=	x //= 25	Same as x = x // 25
**=	x **= 25	This is same as x = x ** 25
>>=	x >>= 25	Same as x = x >> 25

L-value and R-Value

An lvalue (locator value) represents an object that occupies some identifiable location in memory (i.e. has an address). rvalues are defined by exclusion. Every expression is either an lvalue or an rvalue, so, an rvalue is an expression that does not represent an object occupying some identifiable location in memory.

 (a) A left value or l-value is an assignable object. It is any expression that may occur on the leftside of an assignment. Variables are obvious l-values, but so are items in lists.

(b) A right value or r-value is any expression that has a value that may appear on the right of an assignment. In python, everything is an r-value.

(c) Traditionally, the underscore ( ) is used as a place-holder for an l-value when we don't care about the result of the assignment.

(d) In assignment, a tuple of l-values is, itself an l-value:

```
>>> (a,b,c) = (1,2,3)
>>> a,b,c = 1,2,3
>>> (a,b),_,c = (1,2,),9,3
```

Each of these effectively assigns a=1, b=2, and c=3.

(e) These complex assignments happen in parallel, so we can exchange values with:

>>> a,b = b,a

Really: it's tuple assignment!

(f) Here's Euler's algorithm for finding greatest common divisors:

```
def gcd(a,b):
    while a > 0:
    a,b = (b,a) if a > b else (b%a,a)
    return b
```

(g) when an asterisk precedes a variable name used as an l-value, it means assign this

variable the remaining r-values as a list. This is very powerful:

>>> car,*cdr = (1,2,3)

>>> cdr

[2, 3]

Summary

- Variables are referred to "envelop" or "buckets" where information can be maintained and referenced. Like any other programming language Python also uses a variable to store the information.
- Variables can be declared by any name or even alphabets like a, aa, abc, etc.
- Variables can be re-declared even after you have declared them for once
- In Python you cannot concatenate string with number directly, you need to declare them as a separate variable, and after that, you can concatenate number with string
- Declare local variable when you want to use it for current function
- Declare Global variable when you want to use the same variable for rest of the program
- To delete a variable, it uses keyword "del".