Variables in Python

What are Variables?

A variable in Python represents a named location that refers to a value and whose values can be used and processed during the program run. In other words, variables are labels/names to which we can assign value and use them as a reference to that value throughout the code.

Variables are fundamental to programming for two reasons:

- **Variables keep values accessible**: For example, The result of a time-consuming operation can be assigned to a variable so that the operation need not be performed each time we need the result.
- **Variables give values context:** For example, The number 56 could mean many different things, such as the number of students in a class or the average weight of all students. Assigning the number 56 to a variable with a name like **num_students** would make more sense to distinguish it from another variable, **average_weight**, which would refer to the average weight of the students. This way, we can have different variables pointing to different values.

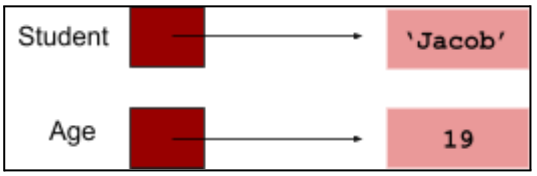
How are Values Assigned to A Variable?

Values are assigned to a variable using a special symbol "=", called the **assignment operator**. An operator is a symbol, like = or +, that performs some operation on one or more values. For example, the + operator takes two numbers, one to the left of the operator and one to the right, and adds them together. Likewise, the "=" operator takes a value to the operator's right and assigns it to the name/label/variable on the left of the operator.

For example, let us create a variable, namely **Student** to hold a student's name and a variable **Age** to hold a student's age.

```
>>> Student = "Jacob"
>>> Age = 19
```

Python will internally create labels referring to these values as shown below:



Now, let us modify the first program we wrote.

```
greeting = "Hello, World!"
print(greeting)
```

Here, the Python program assigned the value of the string to a variable `greeting,` and then when we call `print(greeting)`, it prints the value that the variable, `greeting`, points to i.e. `"Hello, World!"`

We get the output as:-

```
Hello, World!
```

Naming a Variable

You must keep the following points in your mind while naming a variable:-

- Variable names can contain letters, numbers, and underscores.
- They cannot contain spaces.
- Variable names cannot start with a number.
- Variable names are case sensitive. For example, the variable names **Temp** and **temp** are different.
- While writing a program, creating self-explanatory variable names help a lot in increasing the readability of the code. However, too long names can clutter up the program and make it difficult to read.