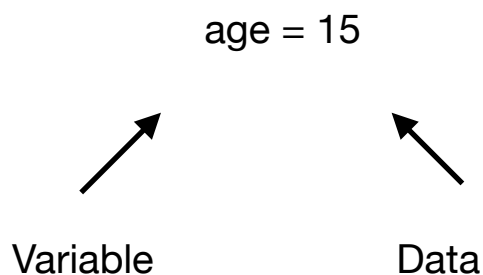# **Variables**

Before getting into variables, let us see what is a program.

- **Program** is a set of instructions written in a programming language to perform tasks.

- A program has two important elements.

    1. **Data** : It is a information such as facts and numbers upon which operations are performed.
    2. **Instructions**: A set of steps to perform operations upon data.

  - Every program needs data and instructions irrespective of the programming language used.
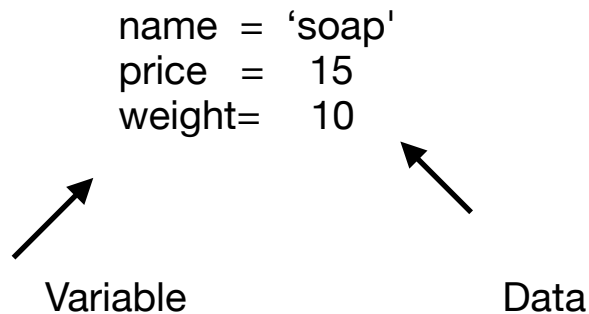 - Instructions without data is useless.

Let us see what are Variables?.

- Data in a program is handled by variables.

- **Variables** are the names given to the data stored in a memory location.
- Variable is the identifier, reference to the data.

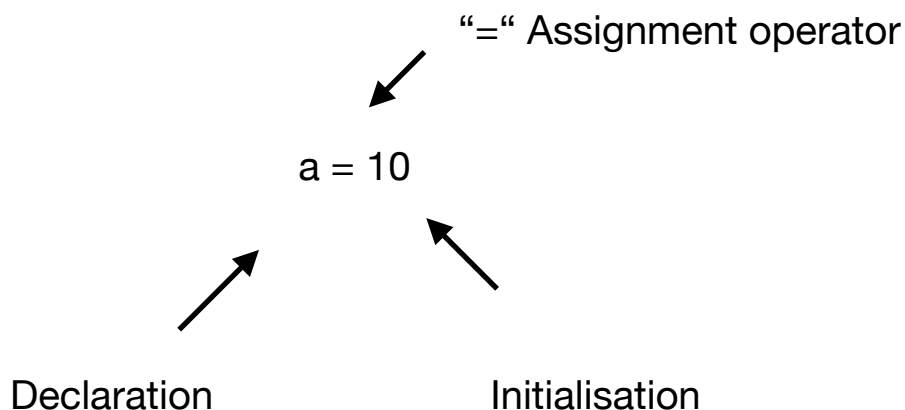Lets us understand a variable with an example.

age = 15

Variable   Data

Another example

```
name  =  'soap'
price  =    15
weight=    10
```

Variable   Data

- **Python variable declaration:**
  - Unlike other programming languages, in python variable is declared and initialised at the same time.

"=" Assignment operator

a = 10

Declaration   Initialisation

  - Declaring a variable is giving the name to the data.
  - Initialisation is storing the value in a variable.

- In python declaring a variable without initialising or say with out the data is not allowed.

```
b= 12.5  ( declaration and initialisation)
c           (only declaration , is not allowed)
```

- Unlike other programming languages like c, c++, java,   in python declaration of data type for a variable is not required.
- The value assigned to the variable determines the data type of the variable.

```
   IDLE   File   Edit   Shell   Debug   Options   Window   Help                                                                    Tue 14 Dec 2:12 PM
                                                            IDLE Shell 3.9.7
Python 3.9.7 (v3.9.7:1016ef3790, Aug 30 2021, 16:39:15)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license()" for more information.
>>>
>>> a=10
>>> print(a)
10
>>> name='Soap'
>>> print(name)
Soap
>>> b
Traceback (most recent call last):
  File "<pyshell#5>", line 1, in <module>
    b
NameError: name 'b' is not defined
>>> price=15
>>>
```

- **Declaration and initialisation of multiple variables:**
  - In python multiple variables can be declared and initialised in a single statement.

    Example:

    a,b,c = 5,10,15

    Here:
    a=5,b=10,c=15 , values will be stored in the respective variables in the order they are declared.

    name, price,weight='soap',10,15

    Here:
    name='soap', price=10, weight=15

```
>>> a,b,c=5,10,15
>>> print(c)
15
>>> name,price,weight='toothpaste',10.5,5
>>> print(price)
10.5
>>>
```

Example : Assigning same value to multiple variables:

x, y, z=1,1,1 ⟶ or   x=y=z=1