**Day-06**

**28-02-2025**

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**How to Define the variable in Python?**

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-> There are two ways:

 1) Compile Time

 2) Run Time

1) Compile Time

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Syntax:

 variable-name/identifier = value

-> Compile-time variable definition can allow to include within the static program.

-> A program can give the same output in multiple times of execution is called as "Static program".

-> The compile-time variable can accept a value using a symbol '='

this value can be fixed for the entire program in any number of executions.

-> The compile-time variable is called as "static variable".

2) Run Time:

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input()

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 -> input() is a pre-defined function.

 -> when we need to define the variable in run-time, we can use "input()".

 Syntax:

 variable-name = input("Text Message")

 -> The run-time definition of the variable we can always provide in the dynamic program

 -> The program can provide the output based on the input that we have processed is called as "Dynamic program".

 -> Run-time variable is also called as "Dynamic variable".

**Datatypes:**

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 -> the type of the data/value can be store in a variable is called as "datatype".

 -> datatypes are classified into two types:

 1) Primitive Datatypes

 2) Non-primitive datatypes/Reference Based datatypes

Primitive Datatypes

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 -> the python have some basic/fundamental datatypes are called as "Primitive datatypes".

 -> Primitive datatypes are categorized into different formats:

 1) Numerical Format/Number Format

 2) Non-numerical format

 3) Text format

 -> Numerical format includes numbers

 those are classified into different datatypes:

 1) Integer : can store any number with positive sign or negative sign includes the '0' also.

 the integer always define without decimal point

 Ex: 1023, 1, -12 etc.

 2) Float: can define the number with decimal-point

 Ex: 123.23, 0.0097 etc.

 3) Complex: is the combination of real data and imaginary data

 Syntax:

 variable = real-data +/- imaginary-data

 -> In python, the imaginary data can always suffix with 'j'

 Ex: 12-24j or 21+31.98j etc.

 -> Non-numerical format includes only datatype:

 boolean: True, False

 Here:

 True ==> 1

 False ==> 0

 print(True + True)

a = 12

b = 1.002

c = True

d = False

e = 'python'

f = 1.23 - 2.34j

print(type(a))

print(type(b))

print(type(c))

print(type(d))

print(type(e))

print(type(f))

 -> Text Format: string

 the group of characters which must be enclosed with '' or "" or ''' '''

s1 = 'a'

s2 = 'abc'

s3 = "a"

s4 = "abc"

s5 = '''a'''

s6 = '''abc'''

print(type(s1))

print(type(s2))

print(type(s3))

print(type(s4))

print(type(s5))

print(type(s6))

Note:

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-> Every data definition in python is as an object

because the python is "Object Oriented Programming Language".

-> That is the reason, when we can use the type(), the output we can get as "class 'int'"

-> That every datatype in python have a pre-defined class.

Ex: Integer --> class --> int

Float --> class --> float

 complex --> class --> complex

boolean --> class --> bool

string --> class --> str