GE23231-PPROBLEM SOLVING USING PYTHON

Introduction to Python-IDLE-Variables-Datatypes

WEEK 01

RAJALAKSHMI ENGINEERING COLLEGE
An AUTONOMOUS Institution
Affiliated to ANNA UNIVERSITY, Chennai

CONTENTS

Evolution of Python

- Developed by Guido Van Rossum in early 1990s.
- Named after a comedy group Monty Python.
- Features derived from many languages like C, C++, Java and other scripting languages
- Available under GNU General Public License (Free, Open Source).
- Python 3.10.2 - 14 Jan 2022 being the latest version.

Python Features

High Level , Interpreted , Interactive and Object Oriented Programming Language

Features

- Beginner Language
- Interactive Mode
- Extensive Standard Libraries
- Portable
- Extendable
- Database and GUI Programming

Python Installation

PYTHON DOWNLOAD: https://www.python.org/downloads/release/python-391/

Python IDLE

(Interactive Interpreter)

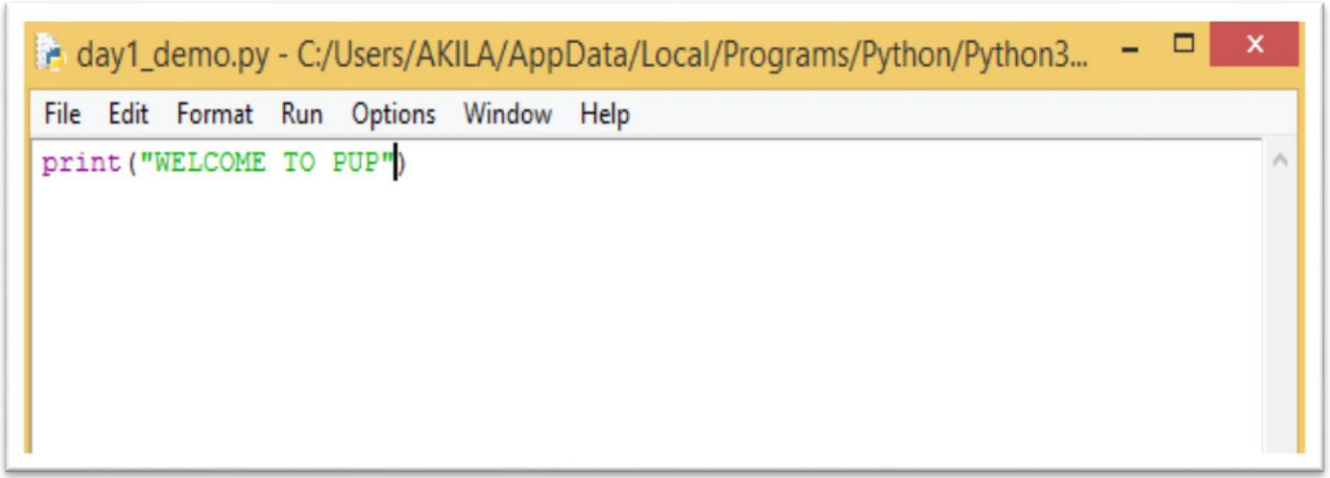
IDLE Shell 3.8.7

File Edit Shell Debug Options Window Help

```
Python 3.8.7 (tags/v3.8.7:6503f05, Dec 21 2020, 17:43:54) [MSC v.1928 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/AKILA/AppData/Local/Programs/Python/Python38-32/day1_demo.py
WELCOME TO PUP
>>> print("WELCOME TO PUP")
WELCOME TO PUP
>>>
```

Python IDLE

Python IDLE (Script Editor)



Output Statement

- The print() function in Python is used to print a specified message on the screen.
- The message can be a string, or any other object, the object will be converted into a string before written to the screen.
- Syntax:

  print(object(s), sep=separator, end=end, file=file, flush=flush)
- Example code:

  print(“Python”)

- Other than object all the arguments are optional.

Output Statement

Examples

```
>>> print("hello")
hello
>>> print(1)
1
>>> print('a')
a
>>> print(3.24)
3.24
>>>
```

```
>>> print(a,b)
10 20
>>>
```

```
>>> print(10,"hello",3.14,True)
10 hello 3.14 True
```

sampli.py - C:/Users/dsorn/AppData/Local/Programs/P

File Edit Format Run Options Window Help

```
print(10,11)
print("hello")
```

```
10 11
hello
```

Output Statement

Print statement-using sep

The separator between the arguments to print() function in Python is space by default (softspace feature) , which can be modified and can be made to any character, integer or string as per our choice. The 'sep' parameter is used to achieve the same

```
>>> print(1,2,3)
1 2 3
>>> print(1,2,3,sep=",")
1,2,3
```

Output Statement

Print statement-using end

The end parameter in the print function is **used to add any string** at the end of the output of the print statement in python. By default, the print function ends with a newline. Passing the whitespace to the end parameter (end=' ') indicates that the end character has to be identified by whitespace and not a newline.

```
1 print(1,2,3)
2 print("a","b")
```

```
1 2 3
a b
```

```
print(1,2,3,end=" ")
print("a","b")
```

```
==== RESTART: C:
1 2 3 a b
```

Input Statement

- input() function is used to take **input from the user.**
- Whatever is entered as input, the input function converts it into a string.
- If an integer value is entered still input() function converts it into a string.

Syntax:

input(prompt)

- **Parameter:**
- Prompt: (optional) The string that is written to standard output(usually screen) without newline.
- **Return**: String object

Input Statement

Python Basics-User Input statement

```
>>> b= input("Enter your age")
Enter your age32
>>> b
'32'
```

```
>>> type(b)
<class 'str'>
>>>
```

```
>>> a=input()
3.14
>>> a
'3.14'
>>> type(a)
<class 'str'>
>>>
```

Input Statement

Example code:

```
number1=input("Enter a number:")
number2=input("Enter another number:")
print("Result:",number1+number2)
```

Since the input got from keyboard(input() function) is always interpreted as a String

Output:
Enter a number :5
Enter another number:6
Result:56

Input Statement

Example code:

```
number1=input("Enter a number:")
number1=int(number1)
number2=input("Enter another number:")
number2=int(number2)
print("Result:",number1+number2)
```

Output:
Enter a number :5
Enter another number:6
Result:11

Fundamental Components

- Operators
- Identifiers
- Variables
- Datatypes

Identifiers

- Identifiers are names given to anything in the program that needs to be identified.
- Helps to identify any item from any place of the program.
- Identifiers are case sensitive.
- They can start with an _ or an alphabet.
- They can have digits but cannot start with a digit.
- Identifiers cannot be keywords.

Example : Bill_id
_billid1

Variables

- Variables are Identifiers for input and output data in a program.
- Used to Identify the memory location of the data stored.
- Its value can be changed during the execution of the program.
- No declaration is needed for variables in python

```
customer_id = 101                                   # Integer
customer_name = "John"                              # String
bill_amount = 675.45                                # Floating-point
x = 5.3 + 0.9j                                      # complex number
print(customer_id, customer_name, bill_amount)      #prints 101 John 675.45
print(x.real)                                       #prints 5.3
print(x.imag + 3)                                   #prints 3.9
```

Variables

Identify the variable

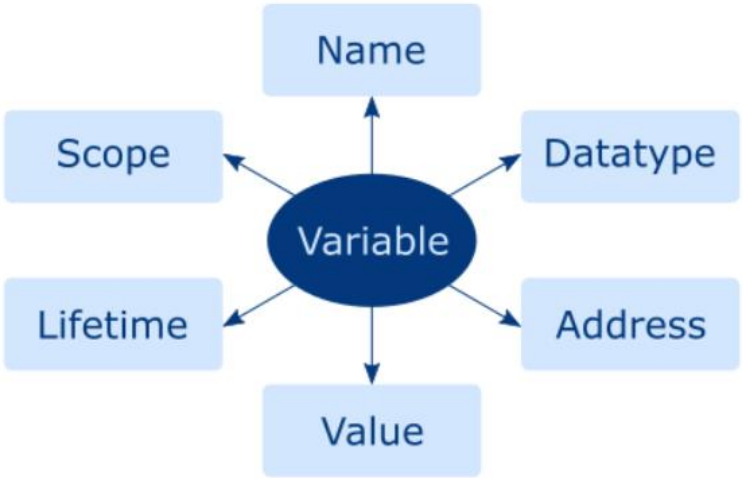
Specify where it can be accessed

Determine type , memory required and operations that can be performed on it

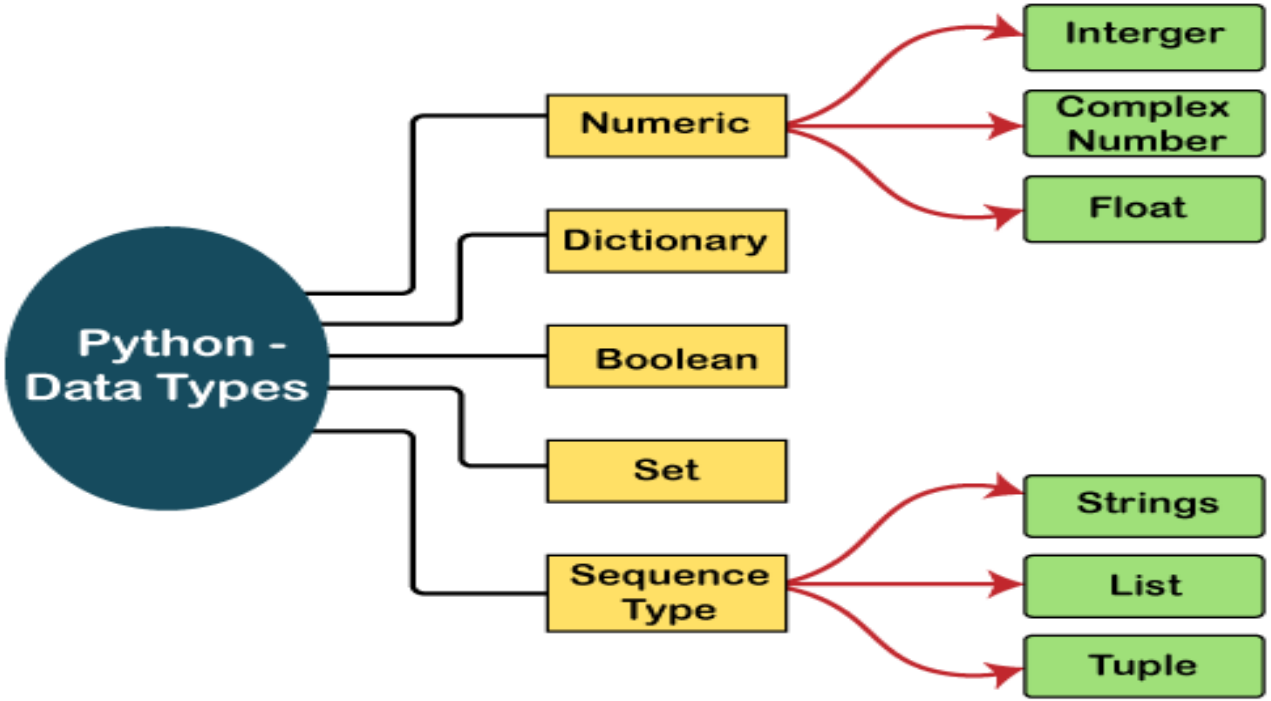
Specify how long it will be stored in memory

Specify where it is stored

Data held by the variable



Datatypes


Python - Data Types
Numeric
Interger
Complex Number
Float
Dictionary
Boolean
Set
Sequence Type
Strings
List
Tuple

Basic Datatypes

Category	Data Type	Example
Integer Type	int	675
	complex	2 + 5i
Floating Type	float	642.43
Textual	String	Infosys
Logical	boolean	True, False

Datatypes-Built-in functions

int()-returns a integer number
float()-returns a decimal/floating point number
bool()-returns a Boolean value
complex()-returns a complex number
str()-returns a string

For handling different types of user inputs

```
#Program to convert user inputs to different datatypes
name=input("Enter ur name")
age=int(input("Enter ur age"))
height=float(input("Enter ur height"))
print(name,age,height)
print(type(age),type(height),type(name))
```

Simple Python Codes

Write a python program to convert the no of days into seconds

```
#Python program to convert no of days into no of seconds
no_of_days=10
no_of_seconds=10*24*60*60
print("The no of seconds is:",no_of_seconds)
```

Write a python program to find the no of flights within the airport.

```
#program to find no of flights in airport
in_flights=int(input("Enter the intial no of flights:"))
takeoff=int(input("TAKEOFF:"))
landed=int(input("LANDED:"))
res_fli=in_flights+landed-takeoff
print("The no of flights are:",res_fli)
```

Comments

- Comment is text in a program's code.
- Comments are used for documenting the code .
- Comment lines will not be executed by the python interpreter.
- Comments help make code easier to understand by explaining what is happening.

Comments

- Comment Line Representation

Single Line Comment:

#This is a single line comment

Multi-line Comment:

“”” This is multiple ”””

Comments

Example code:

```
#variable declaration
name="Ajay"
age = 18
'''printing the output
using the values stored in the variables'''
print("Name :", name)
print("Age:", age)
```

Output:
Name: Ajay
Age: 18

Formatting Output

Old string formatting

- The % operator (modulo) can also be used for string formatting.
- Given 'string' % values, instances of % in string are replaced with zero or more elements of values.
- This operation is commonly known as string interpolation.
- **Syntax:**
  - print('string'%values)
    - String can contain instance of %

```
>>> name="sorna"
>>> age=36
>>> print("my name is %s and my age is %d"%(name,age))
my name is sorna and my age is 36
>>>
```

Formatting Output

String format method

- The string on which this method is called can contain literal text or replacement fields delimited by braces {}.
- Each replacement field contains either the numeric index of a positional argument, or the name of a keyword argument.
- Returns a copy of the string where each replacement field is replaced with the string value of the corresponding argument.

```
>>> name="sorna"
>>> age=36
>>> print("my name is {0} and my age is {1}".format(name,age))
```

Python Identation

- Indentation refers to the spaces at the beginning of a code line.
- Where in other programming languages the indentation in code is for readability only, the indentation in Python is very important.
- **Python uses indentation to indicate a block of code.(Sequence of code)**

```
1 #variable declaration
2 name="Ajay"
3 age = 18
4 '''printing the output
5 using the values stored in the variables'''
6 print("Name :", name)
7 print("Age:", age)
```

```
1 #variable declaration
2 name="Ajay"
3     age = 18
4 '''printing the output
5 using the values stored in the variables'''
6 print("Name :", name)
7 print("Age:", age)
8
```

SyntaxError

unexpected indent

OK

Quiz

What is a correct syntax to output “REC" in Python?

A. print ”REC”
B. echo “REC”
C. print(“REC”)
D. echo(“REC”)

C

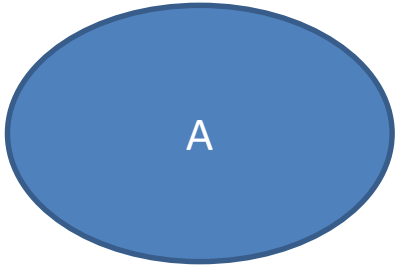
Quiz

How to insert COMMENTS in Python code?

A. #this is a comment

B. <! this is a comment>

C. “this is a comment”



Quiz

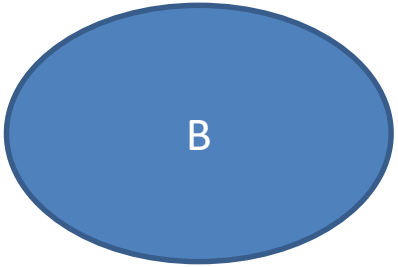
What will be the output of type(“hello”)

A. <class ‘int’>

B. <class ‘str’>

C. <! class ‘str’>

D. <! Class ‘int’>



Quiz

Which one of the following is the correct extension of the Python file?

A. .py

B. .python

C. .p

D. None of these

A

Quiz

What do we use to define a block of code in Python language?

A. Key
B. Brackets
C. Indentation
D. None of these

C

Workouts

1. A cashier has currency notes of denominations 10, 50 and 100. If the amount to be withdrawn is input through the keyboard in tens, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer.
2. If the marks obtained by a student in five different subjects are input through the keyboard, find out the aggregate marks and percentage marks obtained by the student. Assume that the maximum marks that can be obtained by a student in each subject is 100.

thank you