



Python Introduction 2

Tuesday, 6 December 2022

*“An investment in knowledge pays
the best interest”*

- BENJAMIN FRANKLIN

Today's Agenda

- Version History
- Python 2 v/s Python 3
- Introduction To Predefined Functions And Modules
- How `print()` function works ?
- How To Remove Newline From `print()` ?
- Types Of Errors In Python
- Rules For Identifiers
- Python Reserved Words

Python Version History

- First released on Feb-20th -1991 (version 0.9.0)
- Python 1.0 launched in Jan-1994
- Python 2.0 launched in Oct-2000
- Python 3.0 launched in Dec-2008
- Python 2.7 launched in July 2010
- Python 3.6.5 launched on March-2018
- Python 3.7 launched on June-2018
- Python 3.8 launched on Oct - 2019
- Python 3.9 launched on Oct - 2020
- Python 3.10 launched on Oct - 2021
- Python 3.11 launched on Oct - 2022 [Latest version]

The Two Versions Of Python

- As you can observe from the previous slide , there are 2 major versions of Python , called **Python 2** and **Python 3**
- **Python 3** came in **2008** and **it is not backward compatible with Python 2**
- This means that a project which uses **Python 2** will not run on **Python 3**.
- This means that we have to **rewrite the entire project** to migrate it from **Python 2** to **Python 3**

Some Important Differences

- In Python 2
`print "Hello iNeuron"`
- In Python 3
`print("Hello iNeuron")`
- In Python 2
`5/2 → 2`
`5/2.0 → 2.5`
- In Python 3
`5/2 → 2.5`
- The way of accepting input has also changed and like this there are many changes

The Two Versions Of Python

- So to prevent this overhead of programmers , **PSF** decided to support **Python 2** also.
- But this support will only be till **Jan-1-2020**
- You can visit <https://pythonclock.org/> to see exactly how much time is left before Python 2 retires

Which Version Should I Use ?

- For beginners , it is a point of confusion as to **which Python version they should learn ?**
- The obvious answer is **Python 3**



Why Python 3 ?

- We should go with **Python 3** as it brings lot of new features and new tricks compared to **Python 2**
- Moreover as per PSF, *Python 2.x is legacy, Python 3.x is the present and future of the language*
- All major future upgrades will be to Python 3 and , Python 2.7 will never move ahead to even Python 2.8

Types Of Predefined Function Provided By Python

- **Python** has a very rich set of predefined functions and they are broadly categorized to be of 2 types
 - Built In Functions
 - Functions Defined In Modules

Built In Functions

- **Built in functions** are those functions which are always available for use .
- For example , `print()` is a **built-in function** which prints the given object to the standard output device (screen)
- As of version `3.6` , Python has `68` **built-in function** and their list can be obtained on the following URL :
<https://docs.python.org/3/library/functions.html>

What Is `print()` And How It Is Made Available To Our Program ?

```
x = ("apple", "banana", "cherry")  
print(x)
```

How To Remove newline From print() ?

```
print("Hello User")
```

```
print("Python Rocks")
```

If we closely observe , we will see that the 2 messages are getting displayed on separate lines , even though we have not used any newline character.

This is because the function `print()` automatically appends a **newline character** after the message it is printing.

How To Remove newline From print() ?

If we do not want this then we can use the `print()` function as shown below:

```
print("Hello User", end="")  
print("Python Rocks")
```

How To Remove newline From print() ?

The word `end` is called keyword argument in `Python` and it's default value is `"\n"`.

But we have changed it to `empty string("")` to tell `Python` not to produce any newline.

Similarly we can set it to `"\t"` to generate tab or `"\b"` to erase the previous character

Some Examples

1.

```
print("Hello User",end="\t")  
print("Python Rocks")
```

2.

```
print("Hello User",end="\b")  
print("Python Rocks")
```


Types Of Errors In Python

- Just like any other programming language , **Python** also has 2 kinds of errors:
 - **Syntax Error**
 - **Runtime Error**

Syntax Error

- Syntaxes are **RULES OF A LANGUAGE** and when we break these rules , the error which occurs is called **Syntax Error**.
- Examples of **Syntax Errors** are:
 - Misspalled keywords.
 - Incorrect use of an operator.
 - Omitting parentheses in a function call.

Runtime Errors (Exceptions)

- As the name says, **Runtime Errors** are errors which occur while the program is running.
- As soon as Python interpreter encounters them it halts the execution of the program and displays a message about the probable cause of the problem.

Runtime Errors (Exceptions)

- They usually occurs when interpreter counters a operation that is impossible to carry out and one such operation is **dividing a number by 0**.
- Since dividing a number by 0 is undefined , so ,when the interpreter encounters this operation it raises **ZeroDivisionError** as follows:

Functions Defined In Modules

A **Module** in **Python** is collection of functions and statements which provide some extra functionality as compared to built in functions.

We can assume it just like a header file of **C/C++** language.

Python has 100s of built in **Modules** like **math** , **sys** , **platform** etc which prove to be very useful for a programmer

Functions Defined In Modules

For example , the module **math** contains a function called **factorial()** which can calculate and return the factorial of any number.

But to use a module we must first import it in our code using the syntax :

- **import <name of the module>**

For example: **import math**

Then we can call any function of this module by prefixing it with the module name

For example: **math.factorial(5)**

Rules For Identifiers

- **What is an identifier ?**
 - Identifier is the name given to entities like **class**, **functions**, **variables** , **modules** and **any other object** in Python.
- **Rules for identifiers:**
 - Identifiers can be a combination of letters in **lowercase** (a to z) or **uppercase** (A to Z) or **digits** (0 to 9) or an **underscore** (_)
 - No special character except **underscore** is allowed in the name of a variable

Rules For Reserved Words

- What is a Reserved Word?
 - A word in a programming language which has a fixed meaning and cannot be redefined by the programmer or used as identifiers
- How many reserved words are there in Python ?
 - Python contains **33 reserved words** or **keywords**
 - The list is mentioned on the next slide
 - We can get this list by using **help()** in **Python Shell**

Rules For Reserved Words

These 33 keywords are:

Some Important Observations:

*False , True , None , def ,
del , import , return , and , or ,
not , if , else , elif , for , while ,
break , continue , is , as , in ,
global , nonlocal , yield ,
try , except , finally , raise ,
lambda , with , assert , class ,
from , pass*

1. Except **False** , **True** and **None** all the other keywords are in lowercase
2. We don't have **else if** in **Python** , rather it is **elif**
3. There are no **switch** and **do-while** statements in **Python**

Rules For Identifiers

It must compulsorily begin with an underscore (`_`) or a letter and not with a digit . Although after the first letter we can have as many digits as we want. So `1a` is **invalid** , while `a1` or `_a` or `_1` is a **valid name** for an identifier.

```
>>> a_=10
>>> _a=10
>>> _1=10
>>> 1_=10
File "<stdin>", line 1
  1_=10
    ^
SyntaxError: invalid token
```

Rules For Identifiers

Identifiers are case sensitive , so **pi** and **Pi** are two different identifiers.

```
>>> pi=3.14
>>> print(Pi)
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
NameError: name 'Pi' is not defined
```

Rules For Identifiers

- Keywords cannot be used as identifiers

```
>>> if=15
      File "<stdin>", line 1
        if=15
          ^
SyntaxError: invalid syntax
```

- Identifier can be of any length.

Thank
you