Python Introduction

Python Basic Idea

- 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**

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

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

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:

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

Some Important Observations:

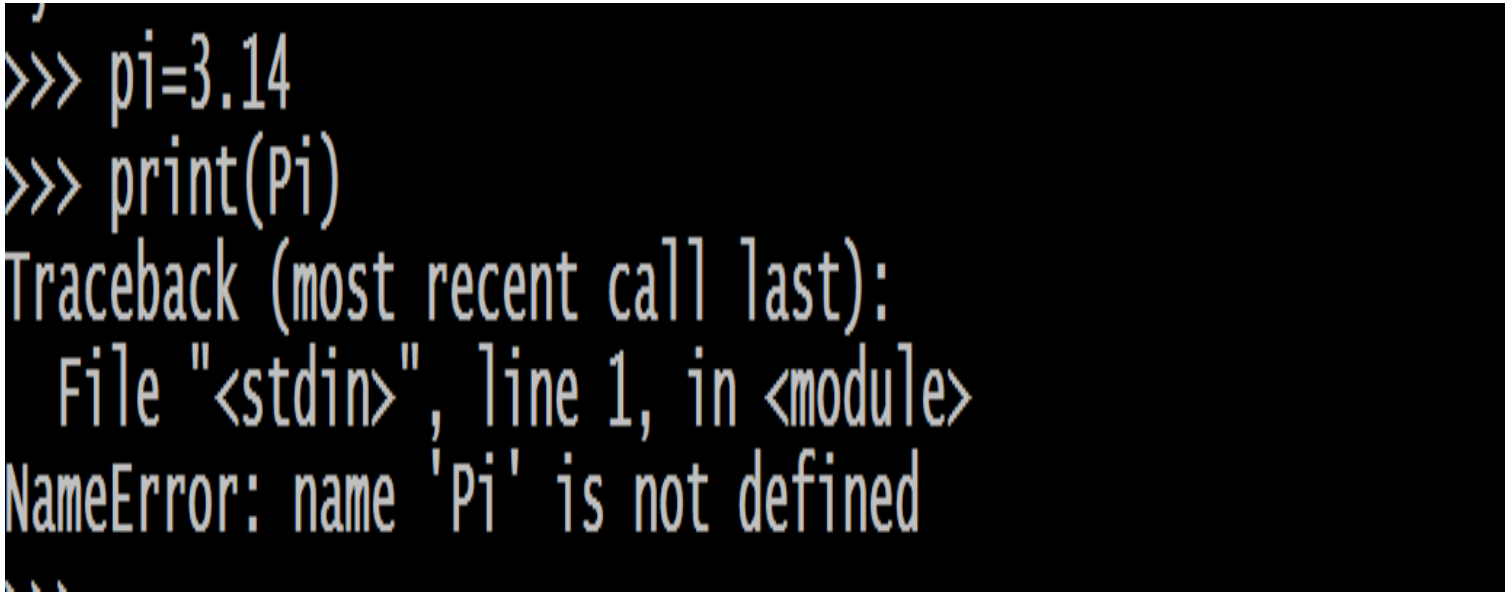
1. Except **False** , **True** and **None** all the other keywords are in lowercase
2. We don't have **else if** in **Python** , rather it is **elif**
3. There are no **switch** and **do-while** statements in **Python**

Rules For Identifiers

- It must compulsorily begin with a 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

Rules For Identifiers

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



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