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Python Material by **Mr. JS Rao** Sir

Generally Every website has 3 ends,

1. Frontend part
2. Backend part
3. Database part

1. Frontend part:

- A person who knows Frontend work very well and who can do any part of frontend work is called Frontend Developer.
- Every Frontend Developer must know about all UI Technologies.
  For example, **HTML , CSS , Bootstrap , JavaScript**, etc…
- A good Froentend developer can easily solve user problems and he/she must be responsible for frontend designing.

2. Backend part:

- A person who knows Backend work very well and who can do any part of backend coding is called Backend Developer.
- Every Backend Developer must know any one or two backend technologies like Python or Java or .Net or PHP.....
- A good Backend Developer can easily write the logics which are required to handle the server or database and he/she must be responsible for any kind of backend work.

3. Database part:

- A person who knows database logics and work on database side then call database developer.
- DB developers required to learn at least any one database like MySQL, Mongo DB, etc..

Full Stack Web Developer:

- A person who can do both frontend and backend and database works very well is called Full Stack Web Developer.
- Stack means layer, so full stack means all layers.

- A person who knows all layers of website is called Full Stack Web Developer.

- Full Stack Web Developer must know about database also along with frontend and backend technologies.

About UI Technologies:

The Frontend Technologies are nothing but UI Technologies.

1. UI stands for User Interface.
2. An interface is a set of items or menus through which a user communicates with a Server.
3. UI is a junction between a user and a computer program.
4. UI Technologies are
    1. HTML
    2. CSS
    3. Bootstrap
    4. Javascript
    5. jQuery
    6. DOM

1. What is Program ?

- A Set of instructions to perform perticular task is called as program.

2. What is Software ?

- Set of programs to perform multiple task is called as Software.

3. what is the purpose of program or Software ?

- To communicate with electronic device.
- One electronic device to communicate with another electronic device.
- To make things easy to reduce humans works we need program or software.

For example : Bank Software

4. How to develop software ?

By using programming languages we can develop.

5. Why general purpose python is a programming language ?

Python is used to develope not only one type of application , it is used in more than one type of applications.

Applications of Python:

The following real time applications are developed by using PYTHON programming,

1. Web Applications
    1. Java ---> Servlets, JSP,..etc
    2. C#.Net ---> ASP.Net
    3. Python--- > Django, Flask, Pyramid, etc..
2. Artificial Inteligence (A.I) Applications
3. Machine learning Applications
4. Deep learning Applications
5. Data Science Applications
6. Devopps applications
7. Text Processing Applications
8. Image Processing Applications
9. Web Scrapping / Harvesting Applications.
10. Health care Applications
11. Testing applications
12. Games/Animation applications
13. IOT applications
14. Robotics applications
15. Data Visulization Applications
16. Embeded Systems
17. Languages Development

18. Automation Testing
19. Operating Systems
20. Console Based Applications
21. GUI based Applications.

About Python Indroduction :-

- Python is a Powerful , general purpose, dynamic, high-level, and interpreted programming language.
- It supports Object Oriented programming approach to develop applications.
- It is simple and easy to learn and provides lots of high-level data structures.
- Python is easy to learn , powerful and versatile scripting language, which makes it attractive for Application Development.

History of Python Programming Language :

- Python Programming Language concevied in the year 1980.
- Python Programming Language implementation begin in the year 1989.
- Python Programming Language officially released in the year 1991 Feb 21.
- Python Programming Language was developed by the "Guido Van Rossum".
- Guido Van Rossum was developed Python Programming Language at mathematical reaserch institute called as CWI (Centrum Wiskunde Informatica), which is located at "Netherlands".
- The Predecessor of Python Programming Language is ABC programming language.

Python Programming language Inspired from What languages?

Guido Van Rossum developed the python language by taking the different language features. They are like,

1. Functional Oriented Programming language like ---->> C-language
2. Object Oriented Programming language like ---->> C++ , Java
3. Scripting Oriented Programming language like --- >> PERL ,Shell Script
4. Modular Oriented Programming language like ---->> Modulo3

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Why is it called Python?

- When Guido Van Rossum began implementing Python, Guido van Rossum was also reading the published scripts from "Monty Python's Flying Circus", it is a BBC comedy series from the 1970s.
- Guido Van Rossum thought he needed a name that was short, unique, and slightly mysterious, so he decided to call the language **Python**.

Versions of Python:

- Python Programming Language contains 3 types of Versions Majorly.
  They are,
  1. Python 1.X where 1 represents Major version and X represents minor versions like 0,1,2,3,4,5,6
  2. Python 2.X where 2 represents Major version and X represents minor versions like 0,1,2,3,4,5,6,7
- Python 3.x where 3 represents Major version and X represents minor versions like 0,1,2,3,4,5,6,7,8,9,10,11,12
- Python 3.X does not have backword compatability with Python 2.x
- Python Software is officially maintained by a Non-Commericial Organization called "**Python Software Foundation(PSF)**".
- The official web site for Python Software downloading is **www.python.org/**

Features of Python Language.

- Features of a language are nothing but Services / Facilities Provided by Language.
- Developers and those features are used by Real Time programmers for developing real time applications.

For example : latest Mobiles features.

1. Simple and easy to learn.
2. Easy-to-read
3. Expressive Language
4. Free and Open Source
5. Dynamic Memory Allocation

6. Interpreted Language

7. Cross-platform or Portable Language

8. Object-Oriented Language

9. Databases

10. Embeddable

11. Extensible

12. Scalable

13. Automatic garbage collecter

Features of Python Explanation.

1. Simple and easy to learn:

- Python is having simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.

2. Easy-to-read:

- Python code is more clearly defined and visible to the eyes.

3. Expressive Language :

- Python can perform complex tasks using a few lines of code.
- A simple example, the hello world program you simply type print("Hello World").
- It will take only one line to execute, while Java or C takes multiple lines.

4. Free and Open Source :

- Python is freely available for everyone.
- It is freely available on its official website www.python.org.
- It has a large community across the world that is dedicatedly working towards make new python modules and functions.
- Anyone can contribute to the Python community.
- The open-source means, "**Anyone can download its source code without paying any money**".

5. Dynamic Memory Allocation:

- In Python, we don't need to specify the data-type of the variable.
- When we assign some value to the variable, it automatically allocates the memory to the variable at run time.
- Suppose we are assigned integer value 15 to x, then we don't need to write int x = 15. Just write x = 15.

6. Interpreted Language:

- Python is an interpreted language, it means the Python program is executed one line at a time.
- The advantage of being interpreted language, it makes debugging easy and portable.

7. Cross-platform or Portable Language:

- Python can run equally on different platforms such as Windows, Linux, UNIX, and Mac os, etc.
- So, we can say that Python is a portable language.
- It enables programmers to develop the software for several competing platforms by writing a program only once.

8. Object-Oriented programming Language:

- Python supports object-oriented language and concepts of classes and objects come into existence.
- It supports inheritance, polymorphism, and encapsulation, etc.
- The object-oriented procedure helps to programmer to write reusable code and develop applications in less code.

9. Databases:

- Python provides interfaces or modules to communicating with all major commercial databases.
  For example, MySQL DB, Oracle DB, SQL Server DB , Mongo DB, etc...
- Using python we can communicate with different databases by installing those interfaces or modules using PIP command.

For example : pymysql , mysqlclient, cx_Oracle, mongodb, etc....

Syntax : **pip install pymysql**

10. Embeddable:

- The code of the other programming language can use in the Python source code.
- We can use Python source code in another programming language as well.
- It can embed other language into our code.

11. Extensible:

- You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.

12. Scalable:

- Python provides a better structure and support for large programs than shell scripting.
- We can develop using python low level , mediam level and high level programs.

13. Automatic garbage collecter

- Python supports automatic garbage collection.

For example,

```
a = 10
b = 20
a = 30
print(a)
```

Output: 30 # but not 10. It means 'a' variable value replaced by 30 value.

- Here 10 value is initially assigned to a variable, next 20 assigned to b variable and 30 assigned again to same a variable only.
- So 10 value is replaced by 30 in variable a .

So python garbage collector automatically removes a = 10 statement.