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The Rise of Python: How This Language is shaping the Future of Tech

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Abstract: In many domains such as data science, software development, artificial intelligence, automation, web development, chatbots, python is playing crucial role of transformative technology. Python has many advantages over other programming languages such as advanced libraries, user friendly syntaxes and strong support from community. In literature many authors proved the cross-platform compatibility, versatility and simplicity of python programming over traditional programming languages. Python programming is ranked at top in IEEE and other global rankings compare to other languages such as Java, SQL, MATLAB, C language, etc. python is not only providing coding environment but also it provides advanced technology support for research in academic to innovations in industrial domain. This paper focuses on different python evolutions of emerging technologies such as automation, artificial intelligence, data science, etc which is shaping the Future of Tech industries and many different domains.

Keywords: High Level Programming, Language Ranking, Tech Industries, Artificial Intelligence, Transformative Technology.

I. INTRODUCTION

In modern day and age programming languages are critical towards constructing the technology we use daily. Python has turned out to be one of the most popular and used languages amongst them. Being easily learned with simple syntax and great structure, Python has drawn the attention of learners as well as developers and researchers around the world. Its simplicity and flexibility are the reasons why both a novice and an experienced programmer is able to use it.

Python is high level technical computing language which makes python more versatile, readable as well as simple interpreted language. Python is invented in 1991 by Guido Van Rossum. Because of dynamic typing and simple syntaxes python even helpful at beginner stage. Immediate reply from python community support and vast number of libraries make python programming more applicable in different applications.

Fig. Python advantages

There are many advantages of python over other programming language. Python is easy to learn as syntaxes are very easy and understandable. Syntaxes from different libraries of python are readable means user can easily read and understand. Vast libraries are invented for python so its useful in multiple applications. Python software and its libraries are opensource as there is no registration or service charges are required [3].

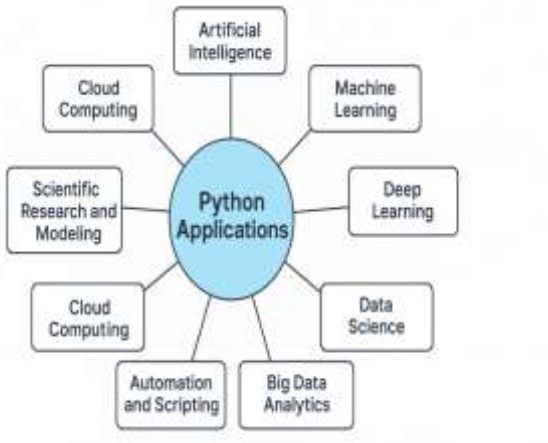

Fig. Different Python Applications

Python supports complete libraries related to different domain as shown in above image as artificial intelligence, machine learning, deep learning, data science, big data analytics, automation and scripting, cloud computing, scientific research and modelling, cloud computing. Vast number of libraries with advance support to above applications makes python programming unique compared to other programming languages [4].

Within the last decade, Python has tremendously increased in popularity, not only as a basic programming language but also as an engine capable of driving high-tech and sophisticated technology through artificial intelligence, data science, web development, and automation. The growth has made Python one of the most crucial figureheads in the future of technology.

Python is always in the top of the world programming language ratings depending on developer activity, job posting, and interest of learning [2]. It has become a popular decision among the developers and technology companies due to its open-source nature and community support [7]. Python gives coders an opportunity to build scalable programs promptly unlike many complicated languages which is quite important in a rapidly evolving world such as the software development and machine learning [3].

A versatile language like Python is one of the greatest strengths that this programming language has to offer. Whether in a scientific study, in an academic project, or in an enterprise application, the rich ecosystem of Python libraries (such as NumPy, TensorFlow, and Pandas) can be used extensively through a variety of applications [4], [6]. According to the surveys, educators also choose Python because of its simple syntax and possibility to teach the basics of programming effectively [5], [9].

Based on the recent technological projections, AI, big data, automation, and the Internet of Things are aspects where Python shines most, and future technology is going to focus heavily on them [10]. It is actively developed and has shown a large base of contributors; among many, Python continues to move with the current trends and tools of development, and is considered future-proof in both academical and industrial applications [8].

In this paper, the plan of an analytical sketch of the growth of python, its real-life applications in the current emerging technologies, and leadership in present day developmental spaces will be addressed. We are also providing findings of surveys, ranking, and expert reports to have a clearer picture of the way a Python has transformed itself as a scripting language to the pillar of technologic development in the world.

II. LITEARTURE SURVEY

The structure and rules of using Python are clear, which makes this programming language easy to learn and understand. Its formal documentation details everything to simple syntax, to complicated programming functions. The book is a valuable guide that enables developers, researchers, and learners to learn how Python functions internally and why it is the most powerful application that can be used in different situations. It also appeals to the foundations and values of the language like the ease of reading and understanding and Python has steadily increased its popularity and usage due to that [1].

In world ranking on programming languages, Python is always on the top. Such rankings are determined by specific criteria such as developer activity, online search trends as well as job ad postings. The fact that Python remains the most used language confirms that it is not a fad but a reliable tool that has been employed by developers over the world. It is popularly credible in software development, Artificial Intelligence and education [2].

Python is one of the most used programming languages in the technology industry and particularly in scientific computing, artificial intelligence and data science. The fact it performs well in these fields means that it is not only broad-scaled but also very practical in finding solutions to technically practical problems of the world. Its syntax is friendly to use and the number of libraries are immense which contribute to why developers both at the research and at the professional front prefer to use it [3].

Surveys conducted across the world have seen thousands of developers explain why they use Python and the outcomes point to some obvious reasons as to why Python is favorable. It is efficient with developers of web development, automation and even in data intensive applications such as machine learning. Being easy to use, having a large community around it, and

having flexibility libraries, Python is an outstanding tool to cover several fields, including education [4].

Python is also a great language to use among the novices and the professionals because it is able to support both scripting and object orientation. Lots of academic and business institutions teach and train developers using it. Having practice projects and real-life examples, Python remains a solid language when it comes to creating sound software applications [5].

Python has turned out to be a language of choice in numerous areas of research. The downsides are that it is open to all scientists and researchers to solve more problems without necessarily having to cope with hard syntax. It has found widespread deployment in information analysis, machine learning, and scientific modeling as a means of enabling more collaborative and efficient work by researchers on common platforms [6].

The success of Python as a once side-project and now a dominating language across the world is commonly attributed to the fact that the language is open-source and has a large community. Its popularity was promoted by the fact that the language is simple to master, platform-independent, and accepted by academic institutions and such tech giants as Google and Microsoft. This development demonstrates the fact that an inexpensive and universal instrument can become a fundamental element of the internationally shared innovations environment [7].

The surveys held on such websites as CodeAddict show that the Python language is not a mere popular programming language but one of the most embraced. Developers desire to know and keep on using it due to the ability to perform complex things easily and fast development. Its popularity is not going to decline in the nearest future, on the contrary, it is still developing and adjusting itself to new technologies [8].

Python is becoming instrumental in the new technology such as artificial intelligence, Internet of Things and automation. It has adaptability that enables it to be integrated in different areas of technology with little adjustment. Consequently, it is deployed in classrooms and research labs, and the industries. The language did not only turn out to be a coding tool but also an innovation driver [9].

According to the technology trend reports, the future of technological innovation depends on the use of AI, automation, and data-oriented solutions. All these are the areas in which Python thrives since Python has simple syntax and extensive library. Although Python is not specifically cited in the reports, the mentioned technologies are to be performed with the help of it. This is another testimony to the fact that python is defining the future of technology [10].

Conclusion

This paper successfully pointed theoretical study of different evolution of python programming in last few decades. Python is used in many applications and some of the applications which considered in this survey study are data science, artificial intelligence, automation, etc. It is observed that python is future programming as the advancement in libraries and providing waste support to different applications in different domain. It is concluded from study that python has many advantages over other programming languages such as opensource, waste libraries for different applications from different domain, support from python community. So, this language shaping the future of tech industry and other domains by its advancements.

Future Scope

As python is adaptable with advanced technologies such as data science, automation, artificial intelligence, python will dominate the tech industry in future. Due to user friendly libraries and quick community responses many industrial people and academic students prefer to use python over other technical computing language. Integration of cross-disciplinary and rapid advancements in python language makes future evolved technology should use python.

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