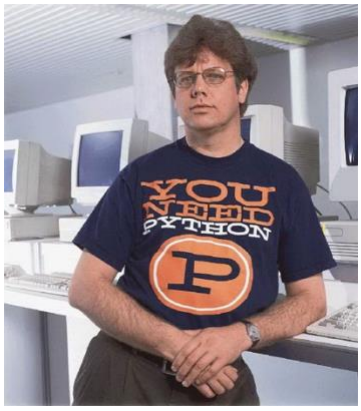
Guido van Rossum

Creator of Python

Introduction



"Python is becoming the world's most popular coding language" – It is precisely for this reason that, at a time when the number of software engineers in the world exceeds 26 million for the first time, I have sought inspiration and have been enthused to explore and write about the creative, ambitious and dedicated visionary who authored this programming language and of course his incredibly distinctive, influential and successful life.

Often referred to as the "Benevolent Dictator for Life", Guido van Rossum is a pioneering figure in the world of software development and is best known as the computer scientist who devised the programming language Python. Not only this, he is recognised for his work developing the ABC programming language, contributions to various research institutes as well as Google and Dropbox. Although delighted by the enthusiasm for his software and proud of his many awards, van Rossum "didn't set out to create a language that was intended for mass consumption". Despite his remarkable achievements, he has come to find the subsequent fame as uncomfortable and struggled with the rigours of overseeing his software and resigned in July 2018.

Early Life & Education

Van Rossum was born in the Hague, Netherlands on the 31st of January 1956. He was born the eldest of three children. Van Rossum's mother and father, a schoolteacher and an architect respectively, lived through the Nazi occupation of the Netherlands during the second World War. This experience shaped their values and influenced van Rossum's outlook on life. A curious child, van Rossum was good at learning, irrespective of whether it was mathematics, science or languages. He recalls being given an educational electronics kit by his parents at age 10 and designing his own circuits instead of following the kit's instructions. A self-confessed nerd, he hadn't even heard of computers when he was in high school but developed his interest in electronics and was inspired by his physics teacher who had a lasting impression on him.

He first learned about computers while at the University of Amsterdam where he graduated with a master's degree in Mathematics and Computer Science in 1982 at the age of 26. He was fortunate as at the time there was no formal degree that focused on computer science however faculty created a specialised programme. His exposure to programming languages started with those that were associated with mathematics such as Algol, Fortran and Pascal however he continued to develop his knowledge of programming by learning from other students and staff. During this period of time, as his interest in programming grew, van Rossum said that he was learning about a "haphazard collection of topics" and expressed a desire to focus more on the area of computer science. The university had an agreement with another nearby university that allowed him to participate in classes taught by Andrew Tanenbaum, best known creating the Minix Operating System. An event which van Rossum refers to as "life-changing" occurred in his third year at university. He was successful in applying for a part-time job in the university's Service Centre which gave his unlimited access to the mainframe and he worked on updating the operating system and writing additional utility tools. He contemplated dropping out of college having landed his "dream job" however his manager and professor urged him to continue his studies.

Career

Van Rossum's first job post-graduation was as a programmer at a research institute in Amsterdam called Centrum Wiskunde & Informatica (CWI) which conducts academic-level research in the fields of computer science and mathematics. At CWI, he worked on building the programming language ABC. Although the project failed, largely due to bad timing as there was no internet at the time and the team were unable to get users feedback, ABC had a significant influence on the design of Python. After the ABC project, van Rossum worked on the Amoeba distributed operating system and other multimedia projects. More importantly, he began creating Python as side project.

Following his experience at CWI, he moved to the United States and worked for various research institutes, including the National Institute of Standards and Technology (NIST) and the Corporation for National Research Initiatives (CNRI) before working for an internal team called Python Labs, developing Python full time. Concerns that CRNI may restrict licencing on Python and threaten its open-source status were the reasons he left in 2000. In the same year he married Kim Knapp. Van Rossum then joined beOpen, a start-up focused on web portals however beOpen failed after the dot-com bubble. Fortunately, van Rossum and his PythonLabs team were acquired by Zope.com who were avid users of van Rossum's software and shared his desire to maintain Python as an open-source project.

Python

The original idea for the programming language which is now used by nearly 40% of professional developers, according to Stack Overflow, started as a Christmas project in 1989. Van Rossum set himself the project of creating his own simple language as he was irritated by the flaws of other languages. In the early nineties, shell scripting and C programming were the bedrock of van Rossum's programming work. He realised that the development of particular utilities, such as a login system, was inefficient and time consuming. Tasks which could previously be executed in minutes in ABC, would take him hours, possibly days in C and frequently wouldn't even work in the shell. It became clear to van Rossum that there was a pressing need for a language that would "bridge the gap between C and the shell".

A "short, unique and slightly mysterious" name was one of his principles he set himself for his new language. He was attracted to the idea of naming languages after heroic figures. For instance, Pascal was named after a French mathematician and Eiffel was named after the engineer who designed the Eiffel Tower. He ultimately decided on the name Python to honour the "irreverent comedic genius" of Monty Python's Flying Circus. Van Rossum's two main principles for his new language were that it should be easy to read and should allow users create their own packages of special-purpose coding modules, which could then be made available to others to form the basis of new programs. He analysed the failures of the ABC project at CWI to look for ideas for his own language and learn from the mistakes that were made. He believed some aspects of the ABC language were excellent such as the indentation for statement grouping, lists and dictionaries as well as the fact that users didn't have to declare variable types. He planned on incorporating these aspects into his new language. However, on the other hand, there were certain aspects of ABC that van Rossum disliked such as the fact that key words were in upper case.

Python quickly became more than just a programming language. A community of Python users, or Pythonistas, grew rapidly and the response far exceeded van Rossum's expectations. Python was open-source from the beginning and at the time, the term "open-source" hadn't yet been coined. The main reason for Python' success in van Rossum's view is the idea that the language was developed on the Internet by a "community of volunteers who feel passion and ownership". He famously said "a programming language created by a community fosters happiness in its users around the world". Van Rossum's proactiveness and

responsiveness were also crucial. He encouraged sharing and open debate, and he often considered implementing users' code contributions that he liked it into the language. A Python Enhancement Proposal Platform was established, and source control systems were formulated. A democratic structure formed, with van Rossum at the helm as "The Benevolent Dictator for Life".

Google, Dropbox & Microsoft

Van Rossum continuously worked on his programming language whilst working as a software engineer in Silicon Valley. After working at Zope for three years following its acquisition of PythonLabs, he spent two years at Elemental Security before joining Google in 2005. He worked at Google for seven years, where he developed the internal code review tool Mondrian, which is written in Python. He then moved to Dropbox, where he spent almost seven years as a Principal Engineer, creating APIs for external developers. In November 2020, van Rossum announced he would come out of retirement to join Microsoft's Developer Division. Interestingly, van Rossum joining Microsoft would have been inconceivable several years ago because of the company's infamous approach to open-source however, today, Microsoft is one of the most active corporate open-source contributors. The appointment of the famed open-source developer will undoubtedly solidify Microsoft's position as a leading software development company.

Impact

Python is revolutionary in its simplicity, flexibility and readability. Since its creation three decades ago, it has become one of the essential building blocks of the digital world and has overtaken almost all of its competitors. The number of Google searches for Python has trebled since 2010, whilst those for other prominent programming languages have been either flat or declining.

Today, Python is used by the Central Intelligence Agency for hacking, Pixar for producing films, Google for crawling web pages and Spotify for recommending songs, to name but a few. Netflix employs Python throughout its business from devising algorithms to managing its content distribution network and automating security functions. The first lines of code for both Google and Dropbox were written in Python. Python has evolved from simply being an improved version of C and the Shell to being one of the most important programming languages in the world. It is no longer just a back-room utility language, but also a key driver of the explosion in big data analytics, machine learning and artificial intelligence. Uses of Python include web and API development, writing scripts to automate simple tasks, data analysis and machine learning. Consequently, its popularity is continuing to rise, particularly in recent years. Stack Overflow announced in 2017 that Python is not only the most popular language on its site, but also the fastest-growing language. The area of data analysis becoming increasingly important and the vast majority of the libraries used for data science or machine learning have Python interfaces such as NumPy or Pandas.

Moreover, Python has expanded to become the language of choice for people that do not have a background in software engineering. Python has become especially valuable for professions that use large quantities of spreadsheets such as the financial sector. The jobs website, eFinancialCareers, reported an almost fourfold increase in job descriptions that mentioned Python between 2015 and 2018.

The many awards van Rossum has received such as being granted the honorary title Dijkstra Fellow by CWI and being made a Fellow of the Computer History Museum, are testament to the significant impact he has had on computer science and the world. Although he no longer holds the title of Python's "Benevolent Dictator for Life", he remains the President of the Python Software Foundation which oversees the Python language. By creating the programming language Python and facilitating its staggering growth, Guido van Rossum has placed immense capability in the hands of millions of software developers and ordinary people around the world.

Bibliography

Blog.dropbox.com. 2020. *Thank You, Guido*. [online] Available at: <https://blog.dropbox.com/topics/company/thank-you--guido> [Accessed 30 October 2020].

Education.ti.com. 2020. *The Power Of Python Explained By Creator Guido Van Rossum*. [online] Available at: <https://education.ti.com/en/t3-europe-sites/t3-europe-home/edublogs/interview-guido-rossum> [Accessed 9 November 2020].

Gvanrossum.github.io. 2020. *Guido Van Rossum - Brief Bio*. [online] Available at: <https://gvanrossum.github.io/bio.html> [Accessed 28 October 2020].

Heath, N., 2019. *Python Is Eating The World: How One Developer's Side Project Became The Hottest Programming Language On The Planet*. [online] TechRepublic. Available at: <https://www.techrepublic.com/article/python-is-eating-the-world-how-one-developers-side-project-became-the-hottest-programming-language-on-the-planet/> [Accessed 10 November 2020].

Lardinois, F., 2020. *Python Creator Guido Van Rossum Joins Microsoft*. [online] Techcrunch.com. Available at: <https://techcrunch.com/2020/11/12/python-creator-guido-van-rossum-joins-microsoft/> [Accessed 12 November 2020].

Rossum, G., 2016. *King's Day Speech*. [online] Neopythonic.blogspot.com. Available at: <http://neopythonic.blogspot.com/2016/04/kings-day-speech.html> [Accessed 6 November 2020].

The Economist. 2018. *Python Has Brought Computer Programming To A Vast New Audience*. [online] Available at: <https://www.economist.com/science-and-technology/2018/07/19/python-has-brought-computer-programming-to-a-vast-new-audience> [Accessed 30 October 2020].

Thefamouspeople.com. 2020. *Who Is Guido Van Rossum? Everything You Need To Know*. [online] Available at: <https://www.thefamouspeople.com/profiles/guido-van-rossum-9533.php> [Accessed 4 November 2020].

YouTube. 2018. *Oral History Of Guido Van Rossum*. [online] Available at: <https://www.youtube.com/watch?v=Pzkdci2HDpU> [Accessed 6 November 2020].