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Programming Languages

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Introduction

Programming languages constitute the backbone of modern computing, serving as the bridge between human logic and machine execution. It are like the building blocks of technology. They have changed a lot over time and have a big impact on how technology has progressed. This paper is dedicated to providing an in-depth examination of programming languages, their features, functionalities, and the critical role they play in the development of software applications and systems.

Early history

The first computer codes were specialized for their applications: e.g., Alonzo Church was able to express the lambda calculus in a formulaic way and the Turing machine was an abstraction of the operation of a tape-marking machine.

Jacquard Looms and Charles Babbage's Difference Engine both had simple languages for describing the actions that these machines should perform hence they were the creators of the first programming language.

First programming languages

The first high-level programming language was Plankalkül, created by Konrad Zuse between 1942 and 1945.[2] The first high-level language to have an associated compiler was created by Corrado Böhm in 1951, for his PhD thesis.[3] The first commercially available language was FORTRAN (Formula Translation), developed in 1956 (first manual appeared in 1956, but first developed in 1954) by a team led by John Backus at IBM.

When FORTRAN was first introduced, it was viewed with skepticism due to bugs, delays in development, and the comparative efficiency of "hand-coded" programs written in assembly.[9] However, in a hardware market that was rapidly evolving; the language eventually became known for its efficiency. It is still a popular language for high-performance computing[10] and is used for programs that benchmark and rank the world's TOP500 fastest supercomputers.[11]

Another early programming language was devised by Grace Hopper in the US, named FLOW-MATIC. It was developed for the UNIVAC I at Remington Rand during the period from 1955 until 1959. Hopper found that business data processing customers were uncomfortable with mathematical notation, and in early 1955, she and her team wrote a specification for an English language programming language and implemented a prototype.[12] The FLOW-MATIC compiler became publicly available in early 1958 and was substantially complete in 1959.[13] Flow-Matic was a major influence in the design of COBOL, since only it and its direct descendant AIMACO were in use at the time.[14]

The Making Of Modern Languages By The Old One

In 1958, two coding languages were created: Algorithmic language (ALGOL) and List Processor (LISP). American and European

computer scientists came together to create ALGOL, which is believed to be the origin of popular programming languages such as C, C++, Java, and Pascal.

McCarthy created LISP to be used in his artificial intelligence applications, and it is one of the oldest computer programming languages still used today. Many individuals and companies continue to favor LISP over other programming languages, such as Ruby or Python.

One of the best programming languages out there is Java. It was created in 1991 by James Gosling for a software project for interactive TV, and these days it's still immensely popular on mobile devices and PCs. JavaScript is another great programming language that Brendan Eich created in 1995. It's used primarily as a scripting language in websites, including Gmail and Adobe Photoshop, but it can also be used to create web pages or PDF files (among other things).

PHP was originally introduced in 1995. Its purpose is to help people and companies create and maintain their websites, and this includes our own personal homepage, Facebook, Wikipedia, and many others.

Microsoft created C# in 2000 with the goal of merging some of the benefits of C++ with the functionality of Visual Basic. Notably, it can be used more easily than Java while still retaining a lot of its power. The only Microsoft tools and products that are not written in C# are outdated.

INDIA

From India 3 Of the languages were created :

1 . **Julia, Co-created by Viral B Shah :**

Viral B Shah is a computer scientist born and brought up in India. He is also famously knowns as the co-creater of the programming language Julia. It is an open-source, high-level, dynamic language, designed mainly to write any application possible with utmost ease. Launched in 2012 , Julia Began to gradually attain higher level of competency In the established languages like Python and MATLAB , Julia is also well-suited for computational science and high-performance numerical analysis, which once used to be highly demanding tasks.

Today , Julia has become the first choice of innumerable developers who wish to develop an application without much chaos . The Idea and initial groundwork for Julia took place in 2009. The aim was to develop a programming language that is easy-to-use, free, and high-level at the same time. As per the lastest records of 2021 , users in more than 10,000 companies have downloaded Julia , with over 29 million downloads . Its latest release was on July 14 ,2021.

2. **Kojo, developed by Lalit Pant :**

First Introduced in 2010, Kojo is an open-source programming language and an integrated development environment developed by Lalit Pant, a programmer based in Dehradun, India . Kojo is based upon and written in Scala, another programming language. Lalit once stated that he chose Scala as to be foundation of Kojo for 2 reasons : Firstly , because of its low barrier to entry and secondly , its potential power.

Due to this popularity and easy access , numerous schools in India and world use Kojo. As it is an easy language to start with, people all around the globe prefer Kojo for fostering computer-based skill development at an early age.

Apart from schooling, Kojo has been also used to organize multiple events like Silicon Valley camp , CoderDojo , Hack The Future etc .

3. **Visual J# developed at Microsoft India development Centre in Hyderabad :**

Pronounced as "visual jay-sharp", Visual J# was introduced by a team of Indian Developers working Hyderabad-based Microsoft Development Centre (HITEC) . Visual J# was A programming language that would act as a

transactional language for Visual J++ and Java programmers . It was introduced in 2002, but unfortunately , did not last very long. It was discontinued in 2007 . The final release of the product was supported until October 2017.

Uses Of Programming languages in Modern World IN Different Field

Programming Languages are used in many fields in today's world things like :

1.Website & Mobile Apps :

There Are over 1.7 Billion Websites on the internet today , all of which are powered by some programming language . Today, these website & mobile applications have brought every activity & task to the fingertip of the users . Want to reserve a hotel, order food , Connect with friends , find jobs , book a cab , watch favourite shows or movies ? Coding has enabled everything.

2.Digital Assistances (A.I) :

Digital assistants are making the lives of people easier today by allowing them to find everything with just voice commands. Siri, Alexa, Google Assistant are some fine examples of the top digital assistants in use today. These devices use the latest technologies like artificial intelligence (AI), machine learning, the internet of things (IoT), and cloud computing. The powerhouse behind these technologies is the innovative programs written in different coding languages. One can use these smart devices to find answers to their questions with voice commands, send emails, reply to messages, set alarms, control smart homes, reserve seats in buses, trains, and flights, get directions to any destination and do much more.

3. Exploring Space :

Programming has been playing a big part in exploring space since its inception. Today, NASA is using coding languages like Python to explore, discover, and know more about the Earth and universe. The innovative solutions created by NASA are powered by Python. Developers at space organizations use coding to create programs that can find the kind of materials present in space at different locations, predict radiation on the moon for the safety of astronauts, as well as collect petabytes of crucial data to understand things about the Earth. Currently, NASA is working on its Artemis program, where Python is being used to get a better idea of the moon.

4. Solving Business Challenges :

Businesses of all sizes today need some sort of software solution to make their processes easier. For instance, the use of software and tools like SAP, Microsoft Office, Google Chrome, Antivirus, Media Player, Photoshop, Skype, AnyDesk, etc. is mainstream today. Every software has its unique set of features and benefits to solve different challenges and improve the way people work. All these possibilities are the boon of coding languages. Chrome helps people to browse any website on the internet, Antivirus software helps in protecting computer systems from viruses, Skype helps in enabling internal and external communications, etc.

5. Transportation & Accommodation :

A few years ago, it was tough to get a cab at the right price and at the right time. But with the advent of transportation apps like Uber, things have completely changed. Today, there are several online services available, using which people can quickly hire the vehicles of their choice at a reasonable price. Moreover, there are also functionalities to track the ride, time, find help when needed, and rate & review the journey. All these services are also enabled by programming languages. Traveling and finding the desired accommodation at the destinations was another challenge for tourists. They needed to visit the hotels one by one to finally find the right one for them. Also, it sometimes involved overpaying for the accommodation, or it didn't meet their expectations. However, today there are services like Airbnb that have brought the hotels, accommodation places, and experiences on a single platform. Travelers can browse the hotels online, see rooms, amenities, pricing, and reviews

of other users before booking a room for themselves.

Wrapping Up : Undoubtedly, programming languages today have an impact on almost everything today . It has transformed the way we live and change the world for the better . It is not only helping in making it easier to perform everyday tasks but also significantly improving the operations for businesses and helping even the space organizations .