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# JAVA

## Preparation Toolkit

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# History of Java:

The history of Java is very interesting. Java was originally designed for interactive television, but it was to advanced technology for the digital cable television industry at the time. The history of Java starts with the Green Team. Java team members (also known as Green Team), initiated this project to develop a language for digital devices such as set-top boxes, televisions, etc. However, it was best suited for internet programming. Later, Java technology was incorporated by Netscape.

The principles for creating Java programming were "Simple, Robust, Portable, Platform-independent, Secured, High Performance, Multithreaded, Architecture Neutral, Object-Oriented, Interpreted, and Dynamic". Java was developed by James Gosling, who is known as the father of Java, in 951 James Gosling and his team members started the project in the early '90s. The '90s.

Currently, Java is used in internet programming, mobile devices, games, e-business solutions, etc. The following are given significant points that describe the history of Java.

)1 James Gosling, Mike Sheridan, and Patrick Naughton initiated the Java language project     in June 91         The small team of sun engineers called Greene team.
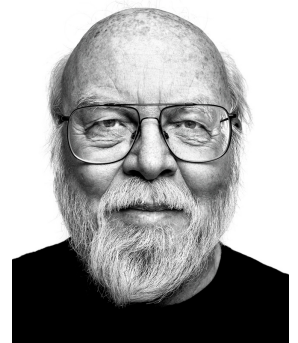
 2) Initially it was designed for small, embedded systems in electronic appliances                               like set-top boxes.

 3) Firstly, it was called "Greentalk" by James Gosling, and the file extension was .gt.

4) After that, it was called Oak and was developed as a part of the Green project.

## Why was Java named "Oak"?

Why Oak? Oak is a symbol of strength and chosen as a national tree of many countries like the U.S.A., France, Germany, Romania, etc. In 1995, Oak was renamed as "Java" because it was already a trademark by Oak Technologies.

## Why is Java Programming named "Java"?

Why had they chosen the name Java for Java language? The team gathered to choose a new name. The suggested words were "dynamic", "revolutionary", "Silk", "jolt", "DNA", etc. They wanted something that reflected the essence of the technology: revolutionary, dynamic, lively, cool, unique, easy to spell, and fun to say. According to James Gosling, "Java was one of the top choices along with Silk". Since Java was so unique, most of the team members preferred Java over other names. Java is an island in Indonesia where the first coffee was produced (called Java coffee). It is a kind of espresso bean. Java name was chosen by James Gosling while having a cup of coffee nearby his office. Notice that Java is just a name, not an acronym. Initially developed by James Gosling at Sun Microsystems (which is now a subsidiary of Oracle Corporation) and released in 1995. In 1995, Time

the magazine called Java one of the Ten Best Products of 1995. JDK 1.0 was released on January 23, 1996. After the first release of Java, there have been many additional features added to the language. Now Java is being used in Windows applications, Web applications, enterprise applications, mobile applications, cards, etc. Each new version adds new features in Java.

## Evolution of Java:

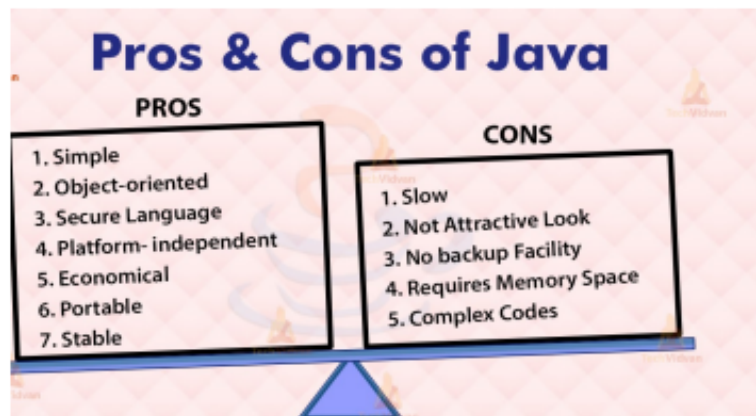Many java versions have been released till now. The current stable release of Java is Java SE 10.

1. JDK Alpha and Beta (1995)
2. JDK 1.0 (23rd Jan 1996)
3. JDK 1.1 (19th Feb 1997)
4. J2SE 1.2 (8th Dec 1998)
5. J2SE 1.3 (8th May 2000)
6. J2SE 1.4 (6th Feb 2002)
7. J2SE 5.0 (30th Sep 2004)
8. Java SE 6 (11th Dec 2006)
9. Java SE 7 (28th July 2011)
10. Java SE 8 (18th Mar 2014)
11. Java SE 9 (21st Sep 2017)
12. Java SE 10 (20th Mar 2018)
13. Java SE 11 (September 2018)
14. Java SE 12 (March 2019) 1
5. Java SE 13 (September 2019)
16. Java SE 14 (Mar 2020)
17. Java SE 15 (September 2020)
18. Java SE 16 (Mar 2021)
19. Java SE 17 (September 2021)

20.Java SE 18 (to be released by March 2022)

Since Java SE 8 release, the Oracle corporation follows a pattern in which every even version is released in March month and an odd version released in September month.

## Advantages and Disadvantages of Java:

Java has been consistently holding the top position of the TIOBE index among all other programming languages. Though many new languages have been discovered, the fame of Java never goes down. Java has been ruling over all other languages for more than 20 years. The majority of experts cannot deny the fact that Java is one of the most powerful and effective languages ever created and is the most widely used programming language in many areas. But, we also know that every coin has two sides; similarly, Java can not run away from this fact, and therefore it has also got its own limitations and benefits; what we call it is a pros and cons of Java



Pros & Cons of Java

PROS
1. Simple
2. Object-oriented
3. Secure Language
4. Platform-independent
5. Economical
6. Portable
7. Stable

CONS
1. Slow
2. Not Attractive Look
3. No backup Facility
4. Requires Memory Space
5. Complex Codes

## Advantages of Java:

Java is an Object-Oriented and general-purpose programming language that helps to create programs and applications on any platform. Java comes up with a bundle of advantages that lets you stick with it.

1. Java is Simple Any language can be considered as simple if it is easy to learn and understand. The syntax of Java is straightforward, easy to write, learn, maintain, and understand, the code is easily debuggable. Moreover, Java is less complex than the languages like C and C++, because many of the complex features of these languages are being removed from Java such as explicit pointers concept, storage classes, operator overloading, and many more.

2. Java is an Object-Oriented Programming language Java is an object-oriented language that helps us to enhance the flexibility and reusability of the code. Using the OOPs concept, we can easily reuse the object in other programs. It also helps us to increase security by binding the data and functions into a single unit and not letting it be accessed by the outside world. It also helps to organize the bigger modules into smaller ones so they are easy to understand.

3. Java is a secure language

Java reduces security threats and risks by avoiding the use of explicit pointers. A pointer stores the memory address of another value that can cause unauthorized access to memory. This issue is resolved by removing the concept of pointers. Also, there is a Security manager in Java for each application that allows us to define the access rules for classes.

4. Java is cheap and economical to maintain Java programs are cheap to develop and maintain as these programs are dependent on a specific hardware infrastructure to run. We can easily execute them on any machine that reduces the extra cost to maintain.

5. Java is platform-independent Java offers a very effective boon to its users by providing the feature of platform independence that is the Write Once Run Anywhere(WORA) feature. The compiled code, i.e the byte code of java is platform-independent and can run on any machine irrespective of the operating system. We can run this code on any machine that supports the Java Virtual Machine(JVM) as shown in the figure below:

# Platform Independent in Java
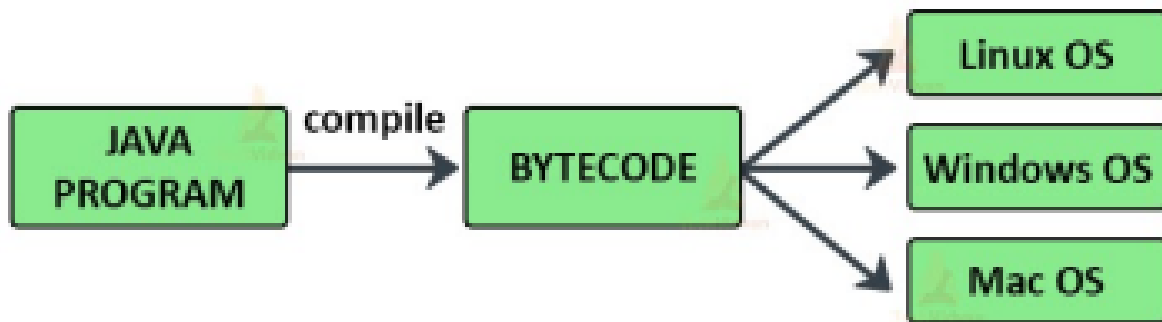


6. Java is a high-level programming language Java is a high-level programming language as it is a human-readable language. It is similar to human language and has a very simple and easy-to-maintain syntax that is similar to the syntax of C++ language but in a simpler manner.

7. Java supports portability feature Java is a portable language due to its platform independence feature. As the Java code can be run on any platform, it is portable and can be taken to any platform and can be executed on them. Therefore Java also provides the advantage of portability.

8. Java provides Automatic Garbage Collection There is automatic memory management in Java that is managed by the Java Virtual Machine(JVM). Whenever the objects are not used by programs anymore and they do not refer to anything that they do not need to be dereferenced or removed by the explicit programming.

Java automatically removes the unused objects with the help of the automatic Garbage Collection process.

9. Java supports Multithreading Java is a multithreaded language that is in Java more than one thread can run at the same time. A thread is the smallest unit of a process. Multithreading helps us to gain the maximum utilization of CPU. Multiple threads share a common memory area and increase the efficiency and performance of the application. These threads run independently of each other without affecting each other.



Multi-threading Language in Java
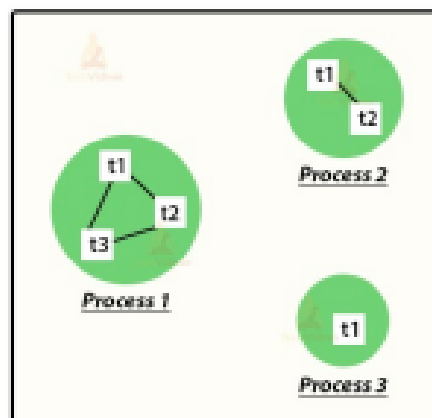
10. Java is stable Java programs are more stable as compared to programs of other languages. Moreover, a new version of Java is released in no time with more advanced features which makes it more stable.

11. Java is a distributed language

Java is a distributed language as it provides a mechanism for sharing data and programs among multiple computers that improve the performance and efficiency of the system.

The RMI(Remote Method Invocation) is something that supports the distributed processing in Java. Moreover, Java also supports Socket Programming and the CORBA technology that helps us to share objects in a distributed environment.

12. Java provides an efficient memory allocation strategy Java has an efficient memory allocation strategy as it divides the memory mainly in two parts- Heap Area and Stack Area.

The JVM provides us the memory space for any variable either from the heap area or the stack area. Whenever we declare a variable JVM gives memory from either stack or heap space.

**Disadvantages of Java:**

To start learning or working upon any programming language you must know its strengths and weaknesses so that you can utilize the best things out of it and avoid causing the circumstances that portray the bad side of the language.

1. Java is slow and has a poor performance Java is memory-consuming and significantly slower than native languages such as C or C++. It is also slow compared to other languages like C and C++ because each code has to be interpreted to the machine-level code. This slow performance is due to the extra level of compilation and abstraction by the JVM. Moreover, sometimes the garbage collector leads to the poor performance of Java as it consumes more CPU time

2. Java provides not so attractive look and feels of the GUI Though there are many GUI builders in Java for creating the graphical interface still they are not suitable for creating complicated UI. There are many inconsistencies while using them. There are many popular frameworks such as Swing, SWT, JavaFX, JSF for creating GUI. But they are not mature enough to develop a complex UI. Choosing one of them which can be suitable for you may require additional research.

3. Java provides no backup facility Java mainly works on storage and does not focus on the backup of data. This is a major drawback that makes it lose the interest and ratings among users.

4. Java requires significant memory space Java requires a significant or major amount of memory space as compared to other languages like C and C++. During the execution of garbage collection, the memory efficiency and the performance of the system may be adversely affected.

5. Verbose and Complex codes Java codes are verbose, meaning that there are many words in it and there are many long and complex sentences that are difficult to read and understand. This can reduce the readability of the code. Java focuses on being more manageable but at the same time, it has to compromise it with the overly complex codes and long explanations for each thing.

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# END

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