FEATURES OF JAVA

DOCUMENTATION

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**FEATURES OF JAVA**

1. Known as Java buzzwords.
2. Objective of Java language:
   * Portable
   * Simple
   * Secure programming language
3. Important features of Java

1.Simple

* + - Easy to learn.
    - Syntax is simple (based on C++).
    - Easy to understand.
    - Removed complicated and rarely used features like pointers, operator overloading.

2.Object-oriented

* + - Java is an Object-oriented programming language.
    - OOPs (Object Oriented Programming) is a methodology that simplifies software development and maintenance by providing some rules.
    - Basic concepts of OOPs:
  + Object
  + Class
  + Abstraction
  + Inheritance
  + Encapsulation
  + Polymorphism

3.Platform Independent

* + - Java is a write once, run anywhere language.
    - A platform is the hardware or software environment in which a program runs.
    - Two types of platforms:
      * Software based
      * Hardware based
    - Java provides a software-based platform.
    - Java code is compiled by the compiler and converted into bytecode.
    - Bytecode is a platform-independent code because it can be run on multiple platforms. (WORA).
    - Java code can be executed on multiple platforms

Note: WORA- Write Once and Run Any.

4. Secured

* + - With Java, we can develop virus-free systems.
    - Java is secured because:
      * No explicit pointer.
      * Java programs run inside a virtual machine sandbox.
    - Java language provides securities by default:
      * Class loader: Used to load Java classes into the Java Virtual Machine dynamically.
      * Bytecode Verifier: It checks the code fragments for illegal code that can violate access rights to objects.
      * Security Manager:  It determines what resources a class can access such as reading and writing to the local disk.

5. Robust

* + It uses strong memory management.
  + A lack of pointers that avoids security problems.
  + There are exception handling and the type checking mechanism in Java.

6. Architecture-Neutral

* + - No implementation dependent features.

For example: the size of primitive types is fixed.

* + - Occupies 4 bytes of memory for both 32 and 64-bit architectures in Java.

7. Portable

* + - Facilitates you to carry the Java bytecode to any platform.
    - It doesn't require any implementation.

8. High Performance

* + - Faster. (compared to other interpreted programming languages.
    - Java bytecode is "close" to native code.
    - Java is an interpreted language that is why it is slower than compiled languages, e.g., C, C++, etc.

9. Distributed

* + - Facilitates users to create distributed applications in Java.

RMI and EJB are used for creating distributed applications.

* + - To access files by calling the methods from any machine on the internet.
    - Helpful when we create large projects.

10. Multithreaded

* + - A process of executing multiple threads simultaneously.
    - It does not block the user because threads are independent, and you can perform multiple operations at the same time.
    - Threads are independent, so it doesn't affect other threads if an exception occurs in a single thread.

11. Dynamic

* + - It supports the dynamic loading of classes.
    - It means classes are loaded on demand.
    - It also supports functions from its native languages, i.e., C and C++.
    - Java supports dynamic compilation and automatic memory management (garbage collection).