

Essentials of Information Technology

PC-CS-305

Programming Basics

Topic & Structure of the lesson



- Introductory Programming Skills
 - What is Java?
 - Why Java is popular?
 - A simple Java application
 - How Java application is executed by a computer

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Terminologies



- **Application**
 - A complete, self-contained program that performs a specific function directly for the user.
- **Applet**
 - A [Java](#) program which can be distributed as an attachment in a [World-Wide Web](#) document and executed by a Java-enabled [web browser](#) such as Sun's [HotJava](#), [Netscape Navigator](#) version 2.0, or [Internet Explorer](#).

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Terminologies



- **Platform**
 - the hardware / software environment in which a program runs.
- **Java platform**
 - a software-only platform that runs on top of other, hardware-based platforms.

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Terminologies

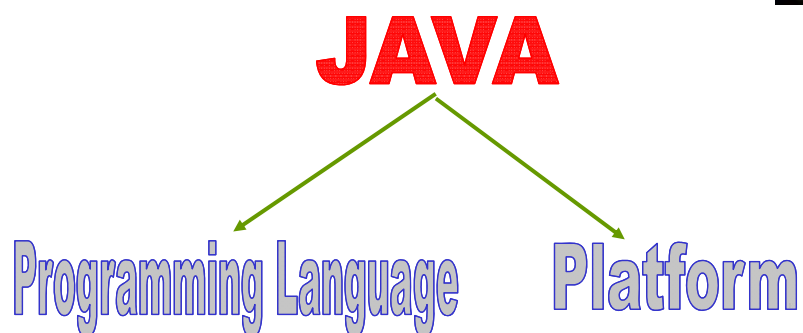


- **Java Application Programming Interface (Java API)**
 - A large collection of ready-made software components that provide many useful capabilities such as graphical user interface (GUI) widgets.
 - The Java API is grouped into libraries (packages) of related components

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What is JAVA?



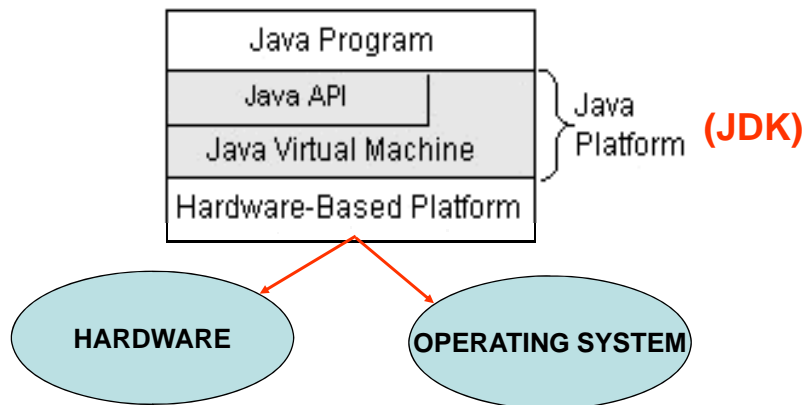
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JAVA as a platform



- software platform



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What is JAVA?



- JAVA in terms of:
 - Language comparison
 - Platform independence
 - Language features

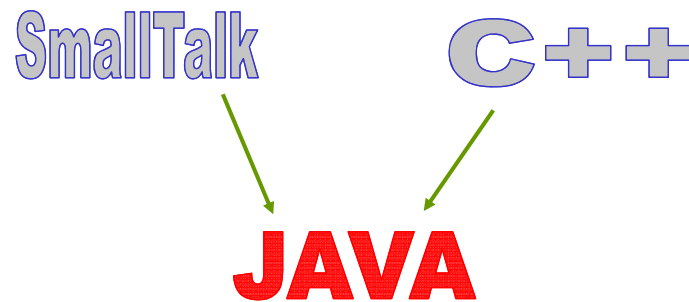
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What is JAVA?



- Language comparison



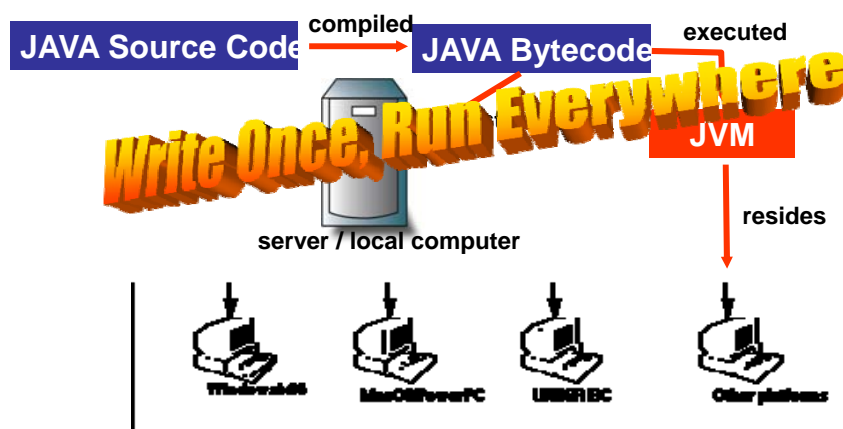
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What is JAVA?



- Platform independence



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What is JAVA?



- Language features
 - Simple
 - powerful functionality without the confusing features (eg. pointers)
 - Reduce 50% of the bugs
 - Object-oriented
 - implements the basic object technology of C++ with enhancement
 - Distributed
 - built-in extensive TCP/IP networking capabilities

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What is JAVA?



- Language features
 - Robust
 - check for problems at compile and run-time - help catch the bugs at the early stage of development
 - handles own memory - no worries on freeing & corrupting memory
 - Reduce development time
 - Secure
 - verification during compilation and interpretation – therefore **reliable**

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What is JAVA?



- Language features
 - Multithreaded
 - threads - light-weighted processes
 - allows many simultaneous activities in 1 program
 - better interactive performance and real-time behaviour
 - Portable
 - basic portability of being architecture neutral / platform independent
 - Java builds its user interfaces (AWT) not operating system's GUI facilities via an abstract window system so the windows can be implemented on UNIX, PC & MAC environments

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What is JAVA?



- Language features
 - Architecture Neutral / Language Independence
 - both compiled and interpreted



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Why is JAVA popular?



- Platform independence
- Makes web pages dynamic
 - can make a page change while user watches it
 - can animate pictures
 - can change the text that's displayed without reloading the entire page.
- Simple
 - Java was designed to make it much easier to write bug free code.
 - it is easy to read and write

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Why is JAVA popular?



- Safe
 - Java was designed from the ground up to allow for secure execution of code across a network, even when the source of that code was untrusted and possibly malicious.
 - implements a robust exception handling mechanism to deal with both expected and unexpected errors.
 - The worst that a Java program can do to a host system is bring down the runtime environment. It cannot bring down the entire system.
- Multi-Threaded
 - A single Java program can have many different processes executing independently and continuously.

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A look at JDK



- Java Development Kit (JDK)
 - contains what one needs to start building and executing JAVA applications and applets.
 - different platforms available
 - J2SE – Java 2 Platform Standard Edition
 - Java Platform, Standard Edition (Java SE) lets you develop and deploy Java applications on desktops and servers. Java offers the rich user interface, performance, versatility, portability, and security that today's applications require.

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A look at JDK



- Java Development Kit (JDK)
 - J2EE – Java 2 Platform Enterprise Edition
 - standard for developing component-based multitier enterprise applications
 - based on J2SE
 - provides additional services, tools and APIs to support simplified enterprise applications development

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A look at JDK



- Java Development Kit (JDK)
 - J2ME – Java 2 Platform Micro Edition
 - set of technologies and specifications targeted at consumer and embedded devices, such as mobile phones, PDAs, printers and TV set-top boxes
 - Java Card Technology
 - Java Card refers to a software technology that allows Java-based applications (applets) to be run securely on smart cards and similar small memory footprint devices. Java Card is the tiniest of Java platforms targeted for embedded devices. The main design goals of the Java Card technology are portability and security.

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Releases of J2SE platform



Version Name	Code Name	Release Date
JDK 1.0	Oak	January 1996
JDK 1.1	(none)	February 1997
J2SE 1.2	Playground	December 1998
J2SE 1.3	Kestrel	May 2000
J2SE 1.4	Merlin	February 2002
J2SE 5.0	Tiger	September 2004
Java SE 6	Mustang	December 2006
Java SE 7	Dolphin	July 2011
Java SE 8		March 2014
Java SE 9		September, 21st 2017
Java SE 10		March, 20th 2018
Java SE 11		September, 25th 2018

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Releases of J2SE platform



- Download the Java Development Kit (JDK)
 - <https://www.oracle.com/technetwork/java/javase/downloads/index.html>
- Download/bookmark the Java API Documentation
 - <https://docs.oracle.com/javase/7/docs/api/>

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Java API documentation



Overview [Java 2 Platform SE 5.0] - Microsoft Internet Explorer

Address: <http://java.sun.com/j2se/1.5.0/docs/api/index.html>

Java™ 2 Platform Standard Ed. 5.0

Overview Package Class Use Tree Deprecated Index Help

Java™ 2 Platform Standard Ed. 5.0

Java™ 2 Platform Standard Edition 5.0 API Specification

This document is the API specification for the Java 2 Platform Standard Edition 5.0.

See: [Description](#)

Java 2 Platform Packages	
java.applet	Provides the classes necessary to create an applet and the classes an applet uses to communicate with its applet context.
java.awt	Contains all of the classes for creating user interfaces and for painting graphics and images.
java.awt.color	Provides classes for color spaces.
java.awt.datatransfer	Provides interfaces and classes for transferring data between and within applications.
java.awt.dnd	Drag and Drop is a direct manipulation gesture found in many Graphical User Interface systems that provides a mechanism to transfer information between two entities logically associated with presentation elements in the GUI.
java.awt.event	Provides interfaces and classes for dealing with different types of events fired by AWT components.
java.awt.font	Provides classes and interface relating to fonts.

<http://java.sun.com/j2se/1.5.0/docs/api/index.html>

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Java API documentation



Detail of
Classes/
Interfaces
- Methods
/Variables

<http://java.sun.com/j2se/1.5.0/docs/api/index.html>

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Starting Java



- Download Editplus from www.editplus.com
- Open Editplus program
 - Tools / Configure User Tools

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Summary of Main Teaching Points



- Introductory Programming Skills
 - What is Java?
 - Why Java is popular?
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Question and Answer Session



Q & A

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