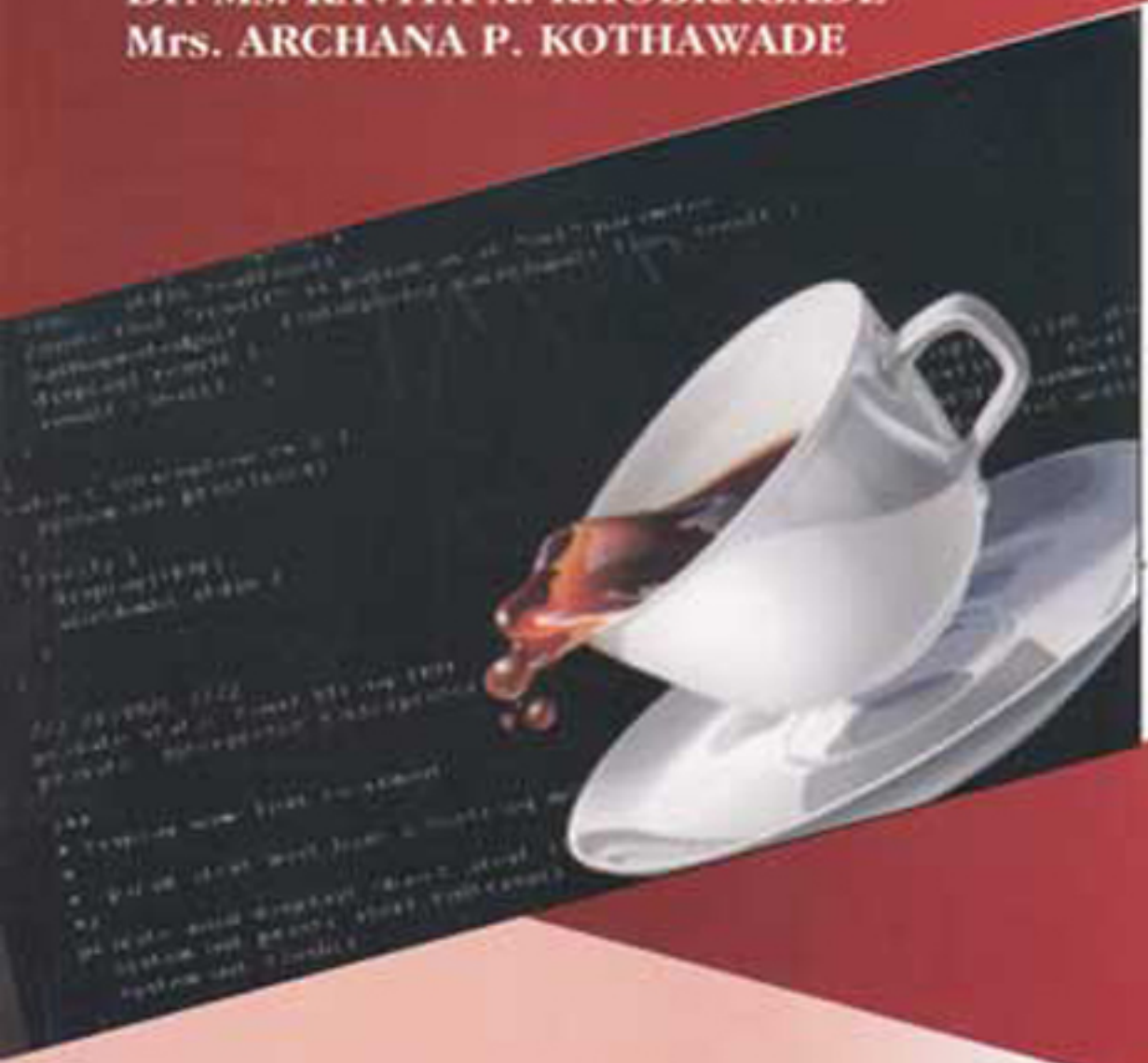
NEW SYLLABUS

B.B.A. (Computer Application) Semester-V
Formerly known as B.C.A.

JAVA PROGRAMMING

Dr. Ms. KAVITA A. KHOBRAGADE
Mrs. ARCHANA P. KOTHAWADE



NIRALI PRAKASHAN

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Formerly known as B.C.A.

As Per Revised Syllabus

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Preface ...

We take an opportunity to present this book entitled as **"Java Programming"** designed for the Students of B.B.A. (Computer Application) Semester V of University.

The book covers theory of Introduction to Java, Classes and Objects, Collection, File and Exception Handling, Applet, AWT and Swing Programming.

A special word of thanks to Shri. Dineshbhai Furia, Mr. Jignesh Furia for showing full faith in us to write this book. We also thank to Staff of M/s Nirali Prakashan for their excellent co-operation in the preparation and finalization of this book.

Although every care has been taken to check mistakes and misprints, any errors, omission and suggestions from teachers and students for the improvement of this text shall be most welcome.

Authors

Syllabus ...

1. Introduction to Java [08]

1.1 Features of java

1.2 JDK Environment & tools like(java, javac, appletviewer, javadoc, jdb)

1.3 OOPs Concepts Class, Abstraction , Encapsulation, Inheritance, Polymorphism

1.4 Difference between C++ and JAVA

1.5 Structure of java program

1.6 Data types, Variables, Operators, Keywords, Naming Convention

1.7 Decision Making (if, switch), Looping (for, while)

1.8 Type Casting

1.9 Array

Creating an array,

Types of Array

- One Dimensional arrays
- Two Dimensional array

1.10 String

- Arrays, methods
- StringBuffer class

2. Classes and Objects [10]

2.1 Creating Classes and objects

2.2 Memory allocation for objects

2.3 Constructor

2.4 Implementation of Inheritance Simple, Multilevel,

2.5 Interfaces

2.6 Abstract classes and methods

2.7 Implementation of Polymorphism

2.8 Method Overloading, Method Overriding

2.9 Nested and Inner classes

2.10 Modifiers and Access Control

2.11 Packages

- Packages Concept
- Creating user defined packages

2.12 Java Built in packages

- java.lang: Math
- java.util: Random, Date,
- Hashtable

2.13 Wrapper classes

3. Collection [06]

3.1 Collection Framework.

3.1.1 Interfaces

- Collection
- List
- Set
- SortedSet
- Enumeration
- Iterator
- ListIterator

3.1.2 Classes

- LinkedList
- ArrayList
- Vector
- HashSet
- TreeSet
- Hashtable

3.2 Working with maps

3.2.1 Map interface

3.2.2 Map classes

- HashMap
- TreeMap

4. File and Exception Handling [08]

Exception

4.1 Exception types

4.2 Using try catch and multiple catch Nested try, throw , throws and finally

4.3 Creating user defined Exceptions

File Handling

4.4 Stream, ByteStream Classes, CharacterStream Classes

4.5 File IO basics

4.6 File operations, Creating file, Reading file (character, byte) Writing file (character, byte)

5. Applet, AWT and Swing Programming [12]

Applet

5.1 Introduction

5.2 Types applet

5.3 Applet Life cycle

- Creating applet
- Applet tag

5.4 Applet Classes

- Color
- Graphics
- Font

AWT

5.5 Components and container used in AWT

5.6 Layout managers

5.7 Listeners and Adapter classes

5.8 Event Delegation model

Swing

5.9 Introduction to Swing Component and Container Classes

Contents ...

CHAPTER 1

Introduction to Java

Contents ...

1.1 INTRODUCTION

- Java is a general-purpose, object-oriented programming language developed by Sun Microsystems in 1991.
- Java programming language was initiated by James Gosling. He is called Father of Java Programming.
- Java was originally called OAK. The First publication of Java 1.0 was released by Sun Microsystems in 1995. It made the promise of "Write Once, Run Anywhere (WORA)", with free runtimes on popular platforms.
- In 2006-2007 Sun released java as open source and platform independent software.
- Over time new enhanced versions of Java have been released. The current version of Java is Java 1.8 which is also known as Java 8.

- Java 8 was released on 18 March 2014 and included some features that were planned for Java 7 but later deferred.
- Java language is an object-oriented language (OOL). Java enables us not only to organize our program code into units called objects but also to take advantage of encapsulation, inheritance, polymorphism and other OOP concepts. Object Oriented Programming (OOP) is an approach that provides a way of modularizing programs by creating partitioned memory area for both data and functions that can be used as templates for creating copies of such modules on demand.
- Sun Microsystems Inc. has divided into Java into three parts as listed below :
  1. **Java SE - Java Standard Edition (J2SE) :** It contains basic core Java classes. This edition is used to develop standard applets and applications.
  2. **Java EE - Java Enterprise Edition (J2EE) :** It contains classes that are beyond Java SE. In fact, we need Java SE in order to use many of the classes in Java EE. Java EE mainly concentrates on providing business solutions on a network.
  3. **Java ME - Java Micro Edition (J2ME) :** Java ME is for developers who develop code for portable devices, such as a PDA or a cellular phone. Code on these devices needs to be small in size and should take less memory.
- There are mainly four types of applications that can be created using java programming :
  1. **Standalone Application :** It is also known as desktop application or window-based application. An application that we need to install on every machine such as media player, antivirus etc. AWT and Swing are used in java for creating standalone applications.
  2. **Enterprise Application :** An application that is distributed in nature, such as banking applications etc. It has the advantage of high level security, load balancing and clustering. In java, EJB is used for creating enterprise applications.
  3. **Mobile Application :** An application that is created for mobile devices. Currently Android and Java ME are used for creating mobile applications.
  4. **Web Application :** An application that runs on the server side and creates dynamic page, is called web application. Currently, servlet, jsp, struts, jsf etc. technologies are used for creating web applications in java.

1.1.1 History of Java

- Java was developed at Sun Microsystems in 1991, by a team comprising James Gosling, Patrick Naughton, Chris Warth, Ed Frank and Mike Sheridan as its members. The language was initially called Oak. It was later termed as Java.

- Java was launched on May, 1995. The Java software was released as a development kit. The first two versions were named JDK 1.0 and JDK 1.1.
- In 1998, while releasing the next version, Sun Microsystems changed the nomenclature from Java Development Kit (JDK) to Software Development Kit (SDK). Also, it added "2" to the name. The released version of Java was called Java 2 SDK 1.2.
- With every version, Java became stronger and stronger. At the time of writing of the book, Java had come up with its version 8 in April 2014 known as JDK.
- Table 1.1 illustrates the various versions released of Java language, till date:

Table 1.1: History of Java

Version	Release date	Major Additions
JDK 1.0	January 1996	Initial release
JDK 1.1	February 1997	Inner classes, JavaBeans JDBC, RMI
J2SE 1.2	December 1998	Swing and Collections Framework
J2SE 1.3	May 2000	HotSpot JVM, RMI, JavaSound
J2SE 1.4	February 2002	Regular expressions, Java Web Start
J2SE 5.0	September 2004	Generics, autoboxing, enumeration
J2SE SE 6	December 2006	Database manager and many new facilities.
JAVA SE7	July 2011	New invoked dynamic bytecode under JSR-292.
JAVA SE8	March 2014	JDK Enhancement Proposals (JEPS).

1.1.2 Popular Java Editors

- Editor alternatively referred to as a text editor.
- A text editor is a type of program used for editing plain text files.
- Text editors are often provided with operating systems and software development packages, and can be used to change configuration files, documentation files and programming language source code.
- Various popular editors for Java are listed below.
  1. **Eclipse:** Eclipse as an integrated development environment (IDE) for Java. Today it is the leading development environment for Java with a market share of approximately 65%.

Fig. 1.1 : Logo of eclipse

2. **Netbeans:** NetBeans IDE is the official IDE for Java 8. With its editors, code analyzers, and converters, you can quickly and smoothly upgrade your applications to use new Java 8 language constructs, such as lambdas, functional operations, and method references. NetBeans IDE provides Java developers with all the tools needed to create professional desktop, mobile and enterprise applications.

Fig. 1.2 : Logo of NetBeans

3. **JCreator:** JCreator is a Java IDE created by Xinox Software. JCreator has three editions Lite Edition (LE), Pro Edition (Pro and Lite-Pro Edition (LE-PRO). JCreator is only available on the Windows operating system. However, both the LE and Pro versions of JCreator run adequately on Linux (using Wine).

Fig. 1.3 : Logo of JCreator

4. **Notepad++:** Notepad++ is a free (as in "free speech" and also as in "free beer") source code editor and Notepad replacement that supports several languages. Notepad++ is a text editor and source code editor for use with Microsoft Windows.

Fig. 1.4 : Logo of Notepad++

5. **jEdit:** jEdit is a free software text editor available under the GNU General Public License version 2.0. It is written in Java and runs on any operating system with Java support, including BSD, Linux, Mac OS Xand Windows.

Fig. 1.5 : Logo of JEdit

6. **Editplus:** EditPlus is a Java editor for Windows. While it can serve as a good Notepad replacement, it also offers many powerful features for Web page authors and programmers.

Fig. 1.6 : Logo of Editplus

1.2 FEATURES OF JAVA (Oct. 2015, April 2017)

- Java language was developed by Sun Microsystems as an Object - Oriented Language (OOL) for general purpose business applications and for interactive, World Wide Web (WWW) based Internet applications.
- There are various features of Java as given in Fig. 1.7.
- Each feature of Java will tell us about how and why Java is a powerful object-oriented programming language.

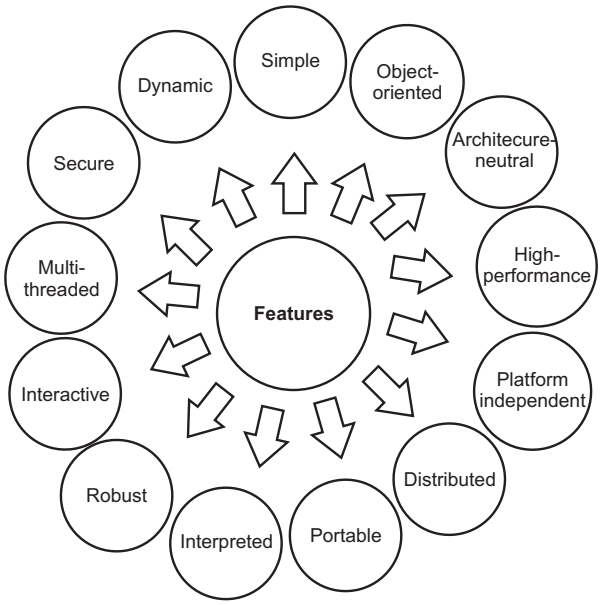

Fig. 1.7: Features of Java

1. **Simple:** Java is a simple language because it is designed to be easy to learn. Programs in Java are easy to write and debug because Java does not use the pointers, preprocessor header files, operator, overloading etc.
2. **Object-oriented:** Java is object-oriented language like C++. Almost everything in Java language is an object based. All program code and data in Java reside within objects and classes. Java language can be easily extended since it is based on the Object model.
3. **Platform independent:** Java Language is platform independent language. A platform is the hardware or software environment in which a program runs. Java code/program can be run on multiple platforms like Windows, Linux, Sun Solaris, MacOs etc.
4. **Interpreted:** Java is an interpreted language, i.e. programs run directly from the source code.

   Java interpreter can execute Java bytecode directly on any computer machine. This machine should have the interpreter ported on it. Generally, we know that interpreters are very slow. But in Java, the interpreter uses the compiled code called bytecode, so it is faster than typical interpreter.

Java Programming

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