

MSc (IT) 2nd Semester
Subject Code: MS 24
Subject Name: Advanced JAVA

Block 1 – Features of Java

Unit 1- Features of Java: Introduction, Features of Java, Java is a Platform, Java is Simple, Java is Object-Oriented, Java is Platform Independent, Java is Safe, Java is High Performance, Java is Multi-Threaded, Java is Dynamically linked, Java is Garbage Collected, Main Features of the Java Programming , Primitive Data Types, Arithmetic and Relational Operators, Arrays, Strings, Multi-Level Break , Memory Management and Garbage Colle, The Background Garbage Collector, Integrated Thread Synchronization, Features Removed from C and C++, No More Typedefs, Defines, or Preproce, No More Structures or Unions, No Enums, No More Functions, No More Multiple Inheritance, No More Goto Statements, No More Operator Overloading, No More Automatic Coercions, No More Pointers.

Unit 2- Application Programming Interface: Introduction Features of API, Implementations, Release Policies, API Examples, API Management, Language Bindings and Interface Generators, API Writer, Overview, API Template, API Documentation, Assumptions, Requirements, Process for creating Javadoc API documentation with, updated source, ClearCase-Based Procedure, Pros, Cons, Process-Specific Issues and Considerations, Purpose of the API documentation, User of API Document, Deliverables for an API, End-user documentation for the publications department, Installation, configuration, and build instructions, A user guide.

Unit 3- Applet Programming: Introduction, Applet method calls under Navigator and Internet Explorer. Event Handling The Component Class, The Event Class, Handling Any Event, Event Handling for the

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Mouse, Keyboard Event Handling, Using Applet Parameters, Embedding Parameters in HTML, Reading Applet Parameters, Working with URLs and Graphics, Accessing a URL, An Example of Displaying an Image

Block 2 – Multithreading Programming

Unit 1- Multithreading in Java: Introduction, Using Threads — Thread Creation, Termination, and Thread Types, Thread type –User and Deamon, Pausing A Thread For Some Amount Of Time — Thread.Sleep, Waiting for a Thread to Terminate — Thread.join, Stopping a Thread — Thread Cancellation, Multi-Threading Issues — Visibility, Safety, Liveness (and Performance), Visibility Issues, Thread Safety Issues, Liveness and Performance Issues, Solutions to Multi-Threading Issues, Thread Containment, Using Immutable Data, Declaring Data Volatile, Atomic Variables (since Java 5), Using Synchronization and Locks, Java 5 is java.concurrent.* packages, Avoiding Deadlock, Communication between Threads, Using Interrupts, Using wait and notify, Other Java Multi-Threading Features, Threads and Exceptions, Thread Scheduling, Thread Names, ThreadLocal variables, ThreadGroups, Thread Pooling, Timers, Testing Concurrent Programs, Summary.

Unit 2- Synchronization: Introduction, Thread Interference, Memor, Consistency Errors, Synchronized Methods, Intrinsic Locks and Synchronization, Locks In Synchronized Methods, Synchronized Statements, Reentrant Synchronization, Atomic Access, Summary.

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Unit 3- Java Beans: Introduction, What is a Bean? , Reusable Software Components , Beans, Widgets, Controls, and Components, Beans or Class Libraries, Application Builder Tools, Linking Components in Builder Tools, Nesting Components, GUI builders.

Unit 4- Tomcat Server: Introduction to Architecture of Tomcat Server What is a Tomcat Valve, The Access Log Valve, The Remote Address Filter, The Remote Host Filter, The Request Dumper Valve, Configuring Security Realms, Security Realms, Memory Realms, Protecting a Resource with a Memory Realm, Installation of Apache & Tomcat Server, Using Tomcat's Manager Application, Gaining Access to the Manager Web Application, Embedding Tomcat into a Java Application, Tomcat Installation, Installing to Linux.

Block 3 – JSP & CORBA

Unit 1- Servlet: Introduction, Servlets vs CGI, The Basic Servlet Architecture, HTTP, Servlets Step by Step, Hello World!, A Form Processing Servlet, Data Management, Client Interaction.

Unit 2- JSP (Java Server Pages): Introduction, JSP and Servlets, JSP Syntax, JSP Scripting Elements and Objects, JSP Implicit Objects, Scripting Elements, JSP Actions, Examples of tags, JSP Tag Libraries, JSP Standard Tag Library (JSTL), JSP Technology in the Java EE 5 Platform, Internationalization, JSP 2.0, Model-View-Controller Paradigm.

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Unit 3- CORBA: Introduction, CORBA Architecture, The Object Request Broker, Different vendors and different ORBs, Interface Definition Language, Dynamic Invocation Interface, Dynamic Skeleton Interface, Interface Repository, Object Adapters, Client and Object Implementation, Object Services, New Features in CORBA 3.0, Portable Object Adapter, CORBA Messaging, Objects by Value.

Unit 4- Advanced Database Handling (JDBC): Introduction, JDBC Product Components, JDBC Architecture, A Relational Database Overview, Integrity Rules, Joins, Common SQL Commands, Result Sets and Cursors, Transactions, Stored Procedures, Metadata.

Block 4 – Advanced Techniques

Unit 1- The Java Foundation Classes: Introduction. Installing And Using The Jfc, Ideas behind Swing, The Swing Class Hierarchy, Writing A Simple Jfc Program, Setting the Look and Feel, Setting the Window Close Box, Making a JFrame Class, A Simple Two Button Program, More on JButtons, Buttons And Toolbars, Radio Buttons, The JToolBar, Toggle Buttons, Sample Code, Menus And Actions, Action Objects, Design Patterns in the Action Object, The Jlist Class, List Selections and Events, Changing a List Display Dynamically The Jtable Class, A Simple JTable Program, Cell Renderers, The Jtree Class, The TreeModel Interface.

Unit 2- EJB (Enterprise Level java Beans): Introduction, Enterprise Distributed Object Computing (EDOC), Transaction Processing (TP) Monitors, Object Request Brokers (ORBs), Component Transaction Monitor (CTM), Enterprise JavaBeans, EJB Architecture, Types of

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EJBs, Session Beans: Stateful and Stateless, Entity Beans: Container and Bean Managed Persistence, Why EJB (Enterprise Java Beans)?.

- Unit 3- Wireless Application Protocol (WAP):** Definition and Overview, Definition, Overview, Introduction, Benefits, Why Choose WAP?, Mobile-Originated Example of WAP Architecture, Architecture of the WAP Gateway, The Future of WAP, Handset Manufacturers and WAP Services, WAP in the Competitive Environment.
- Unit 4- C# and Java Resources:** Introduction, The More Things Change The More They Stay The Same, The Same But Different, Importing Libraries, Events, Cross Language Interoperability.
- Unit 5- Security Issues in Java:** Introduction, Background on Executable Content, The Problem, What Needs Restrictions?, Scenarios, Java's Approach, The Language, The Libraries, ClassLoader, SecurityManager, Java Enabled Browsers, Analysis, Implementation, Scenarios, Digital Signatures.