

Core JAVA Syllabus

1. Introduction to JAVA

- Need of JAVA
- How JAVA works
- Features of JAVA
- Installation of JAVA
- Path Variable
- JDK, JVM & JRE
- Working of JVM
- First program of JAVA

2. Language Fundamentals

- Variables of data type
- Operators
- Type casting

3. Flow Control

- IF – Else
- Switch – Case
- While – Loop
- For – Loop
- For – Each – Loop
- Labelled, Break & continue statement

4. OOPs

- What is OOPs
- Encapsulation
 - Class, Object & Instance (DM+MF)
 - Static (DM+MF)
 - One object & multiple reference variable
- Polymorphism
 - Need of Polymorphism

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- Type of Polymorphism
- Operator Overloading
- Function Overloading
- This Keyword
- Constructor
 - Need of Constructor
 - Implementation of Constructor
 - No Argument or default Constructor
 - Parameterised Constructor
 - Function name as class name
 - Copy constructor
 - Constructor Chaining
 - Call by reference & call by Value
 - Init Block
 - Local Block
- Static block or Static constructor
- Inheritance
 - Need of Inheritance
 - Type of Inheritance
 - Data member in Inheritance
 - Function Overriding
 - Constructor in Inheritance
 - Association
- Final keyword
- Abstraction
 - Need of Abstraction
 - Abstraction class
 - Interface
 - Function in Interface
 - Data member in Interface
 - Object class function in Interface

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➤ Difference between Abstract class & Interface

5. Packages

- Need of Packages
- How to use Packages
- How to create packages
- Static Import & Sub Packages
- Access Modifiers

6. Nested Classes

- Need Of Nested classes
- Static Nested class
- Non static Nested Class
- Local Nested class
- Annonymouse Nested class

7. Arrays

- Need of Array
- Implementation of Array
- Array of Arrays
- Array of reference variable

8. Garbage Collection

- Need of Garbage collection
- Unreachable Objects
- How Garbage collection is done
- Finalize() Method
- Metaspace memory area
- Different types of References

9. Exceptions

- Need of Exceptions

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- Type of Exceptions
- Try 7 Catch block
- Automatic resource handling
- Throw keyword
- Throws keyword
- Custom Exceptions

10. String Handling

- Introduction to String
- Immutable class
- Creating String class object via Literal
- Creating string class object via Constructor
- String comparison
- String concatenation
- String class Method
- String Buffer class constructor
- String buffer class Method

11. AWT (Abstract Window Toolkit)

- Introduction to AWT
- Creating frame
- Event handling

12. JAVA Swing

- Need of Swing
- Creating J frame
- Layout
- Look & feel
- Formatting caption of component using HTML
- Color Dialog box
- J radio Button
- Creating Menu

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- J file Chooser
- J Internal Frame
- J Combo & j List
- J Table & J tree
- Graphics

13. Multi-Threading

- Need of Threading
- Creating A thread via Association
- Creating A Thread via Inheritance
- Thread Life Cycle
- Methods of Thread Class
- Synchronization
- Synchronized Method
- Synchronized Block
- Wait & Notify Method
- Dead Lock condition
- Task Scheduling & Shutdown Hooks
- Thread Group, Interrupting Thread, Yield() Method

14. I/O Stream

- Need of Stream
- Type of Stream
- Byte Stream Classes
 - File Input Stream / File Output Stream
 - Byte Array Input steam / Byte Array Output Steam
 - Print Steam
 - Data Input Steam / Data Output Steam
 - Piped Input Steam / Piped Output Steam
 - Sequence Input Steam
 - Filter Input Steam / Filter Output Steam
 - Push Back Input Steam

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- Character Stream Classes
 - File reader / File Writer
 - Char Array Reader / Char Array Writer
 - Input Stream Reader / Output Stream Writer
 - Print Writer
 - Buffered reader / Buffered Writer
 - Piped Reader / Piped Writer
 - String Reader / String Writer
 - Filter Reader / Filter Writer
 - Push Back Reader
- Serialization
 - Need of Serialization
 - Implementation of Serialization
- Externalization
 - Need of Externalization
 - Implementation of Externalization
- Nio Package
 - Path/ Paths Access
 - File Class
 - File Visitor Class
- Scanner Class
- Console Class
- Zip Output Stream
- File Class
- File Permission/ File Descriptor
- Jar File Class

15. Networking

- Need of Networking
- Networking Terminology
- Socket Programming
- Creating Echo Server

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- Creating Multi-threaded Server
- UDP Protocol
- URL Class
- File Transfer

16. Reflection

- Need of Reflection
- JAVA.Lang.Class
- Creating Object without new operator
- Reflection with Modifiers
- Reflection with Fields
- Reflection with Constructor
- Reflection with Methods
- Reflection with Super Class
- Reflection with Packages
- Using Private (DM+MF) Outside the Class
- Changing Final variable value
- Creating Own Java p tool
- Array Class

Advance JAVA Syllabus

1- Advance topic

- Runtime and Process Class
- Cloning And Assertion
- Java Compiler Class & Variable Length arguments
- Creating Executable Jar
- Ten Parts of Bytecode
- Wrapper Classes
- Generics
- Enum
- Annotation
- Lambda Expressions

2- Advance Threading

- ReentrantLock
- CountdownLatch
- CyclicBarrier
- Semaphore
- Thread Pools
- Callable Interface
- Blocking Queue
- ConcurrentLinkedQueue
- Exchanger
- Phaser
- ThreadFactory
- ThreadLocal
- Volatile Keyword
- Atomic

3- Java Platform Module System

- Need of Module
- Implementation of Module

4- Collection

- Need of Collection
- Collection, Iterator, Enumeration Interface
- List Interface
 - ArrayList
 - Vector
 - LinkedList
 - Stack
 - CopyOnwriteArrayList
- Map Interface
 - HashMap
 - LinkedHashMap
 - HashTable

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- TreeMap
- NavigableMap
- ConcurrentHashMap
- IdentityHashMap
- WeakHaspMap
- Properties
- Set Interface
 - HashSet
 - LinkedHashSet
 - CopyonWriteArraySet
 - TreeSet
 - NavigableSet
- Queue Interface
 - PriorityQueue
 - ArrayQueue
- Collection Class
- Array Class

5- Date API

- Java . Until Package
 - Data Class
 - GregorianCalendar Class
 - Calendar Class
 - Timezone Class
 - SimpleTimezone Class
- Java . Time package
 - LocalDate
 - LocalTime
 - Month
 - MonthDay
 - Year
 - YearMonth
 - DayofWeek
 - ZonedDateTime
 - Zoneld
- Formatting Date
 - DateFormat
 - SimpleDateFormat
 - DateTimeFormatter

6- Java DataBase Connectivity

- Need of JDBC
- Drivers in JDBC
- Steps For Implementing JDBC
- DriverManager Class
- CRUD Operations with Oracle

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- CRUD Operations With MySQL
- ResultSet Type
- Fetch Size
- Rowset
 - JDBCRowSet
 - CachedRowSet
 - WebRowSet
 - JoinRowSet
 - FilteredRowSet
- PreparedStatement
- CallableStatement
- Batch Updates
- MetaData
 - ResultSetMetaData
 - DatabaseMetaData
 - RowsetMetaData
 - ParametermetaData
- Transaction
- BlobClob
- DateTime
- Inserting Image,XML In DataBaseSequence

7- J2EE

- Need of J2EE
- J2EE Technologies
- Architecture Style of Application
 - Two-Tier Architecture
 - Three-Tier Architecture
 - N-Tier Architecture
- J2EE Containers
 - Web Container
 - EJB Container
- J2EE Servers
 - Web Server
 - Application Server
- J2ee Clients
 - Web Clients
 - EJB Clients
- Different Approaches for Server Side Programming
 - Common Gateway Interface(CGI)
 - Server Side Java Script
 - Active Server Pages
 - Applets Of Java
 - Servlet
- Methods of HTTP Protocol
 - GET Method

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- Post Method
- Other Methods
- Request And Response Headers

8- Servlet

- Need of Servlet
- Directory Structure of Web Component
- Three Ways of creating a Servlet
- Steps for Implementing Servlet
- Creating First Servlet Using Servlet Interface
- Seven ways of calling a Servlet
- Life cycle of Servlet
 - First Request of Servlet
 - Frequent Request of Same Servlet
- Creating Servlet using GenericServlet class
- Creating Servlet using HTTPServlet Class
- ServletConfig, ServletContext Interface
- Servlet Collaboration
 - SendRedirect Method
 - RequestDispatcher Interface
- Setting Attributes
- Handling Request headers
- File upload, Download and Refreshing Servlet
- HTTP status Codes
- AsyncContext interface
- Session tracking
 - Need of Session Tracking
 - Using Cookie
 - URL Rewriting
 - Hidden from Field
- Cookies
- Listeners
 - Need of Listeners
 - Implementation of Listener
 - Listener with Annotation
- Filters
 - Need of Filters
 - Implementation of Filter
 - Login Filter
 - One Filter Multiple Servlet
 - Initparam with Filter
 - Filter with Annotation
- I18n
- Pagination
- Connecting Pool
- Non-Blocking I/O

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- Multipart Annotation
- Inject Annotation

9- JSP

- Problem with Servlet
- Working of JSP
- API for JSP
- Life cycle of JSP
- Scripting Elements
 - Scriptlet tag
 - Expression Tag
 - Declaration Tag
 - Flow Control with JSP
- Implicit Objects
 - Out
 - Request
 - Response
 - Session
 - Application
 - Config
 - Exception
 - PageContext
 - page
- JSP Directive
 - Page Directive
 - Include Directive
 - Taglib Directive
- Standard Actions
 - jsp: include
 - jsp: forward
 - jsp: param
 - jsp: plugin
 - Java Bean Class
 - jsp: useBean
 - jsp: setProperty
 - jsp: getProperty
- Custom Tags
 - Concepts Of Custom Tag
 - API For Custom Tag
 - Files Required For Creating Custom Tag
 - Methods For Custom Tag
 - Life Cycle Of Custom Tag
 - Implementing Custom Tag
 - Accessing Body Of Custom Tag
 - Creating Own SqlTag
- Expression Language

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- EL Operators
- EL Implicit Objects
- JSTL
 - JSTL Core Tags
 - JSTL Sql Tags
 - JSTL Formatting Tags
 - JSTL Functions
- File uploading & Downloading with JSP
- Handling Cookies via JSP

10- Ajax

- Need Of AJAX
- XML HttpRequest object
- AJAX With Servlet
- AJAX With JSP
- AJAX With Database
- Checking Name in Database
- Checking Phone no. in Database
- Creating Dynamic Combo
- AJAX With XML
- Online Java Compiler With Ajax
- Pagination With Ajax

11- JSON

- JSON Introduction
- Converting Java Object Into JSON String
- Writing Java Object Into JSON File
- Reading JSON File Via Java
- JSONParser Example
- JSON With Servlet
- JSON With JSP

12- Mail API

- Java Mail Classes
- Sending Mail Via Console
- Sending Attachments
- Sending Mail Via Servlet

13- RMI

- Need Of RMI
- Working Of RMI
- Stub And Skeleton
- Marshaling And UnMarshaling
- Locating Remote Objects
- Methods Of Naming Class

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- Steps For Implementing RMI
- RMI With Servlet

14- Web Services (JAX-WS)

- Need Of Web Service
- Components of Web Services
- How webservices work
- Steps For Implementing Web Service
- Hello World JAX-WS
- Adding Two Numbers
- Web Client Of JAX-WS
- Downloading File Via JAX-WS

15- Rest Full Services (JAX-RS)

- Introduction to JAX-RS
- JAX-RS Annotations
- Working Of JAX-RS
- Path Annotation
- PathParam Annotation
- QueryParam And Default Value Annotation
- FormParam Annotation
- HeaderParam Annotation
- File Upload With JAX-RS
- File Download With JAX-RS
- JSON With JAX-RS
- XML With JAX-RS
- Converting Java Object Into Xml Via JAX-RS
- JAX-RS With Maven
- Difference Between JAX-WS And JAX-RS

16- Java Message Service

- Need Of JMS
- Publish/Subscribe Messaging
- Point-to- Point Messaging
- Steps for Implementing JMS
- Sending Message Via Publish/Subscribe
- Sending Message Via Point-to-Point Messaging

17- XML

- Introduction To XML
- XML Syntax
- XML Elements
- Document Type Definition (DTD)
 - Internal Doctype Declaration
 - External Doctype Declaration
 - PCDATA And CDATA
 - Declaring An Element In DTD File
 - Creating XML
- DOM Parser

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- Working Of DOM Parser
- Reading XML Via DOM Parser
- Creating XML Via DOM Parser
- Updating XML Via DOM Parser
- SAX Parser
 - Working Of SAX Parser
 - Reading XML Via SAX Parser
 - Converting XML Into Java Objects
- StAX Parser
 - Working Of StAX Parser
 - Reading XML Via StAX Parser

18- Design Patterns

- What Is Design Pattern
- Creational Patterns
 - Factory Pattern
 - Abstract Factory Pattern
 - Singleton Pattern
 - Builder Pattern
 - Prototype Pattern
- Structural Patterns
 - Adapter Pattern
 - Bridge Pattern
 - Composite Pattern
 - Decorator Pattern
 - Facade Pattern
 - Flyweight Pattern
 - Proxy Pattern
- Behavioural Patterns
 - Chain of Responsibility Pattern
 - Command Pattern
 - Interpreter Pattern
 - Decorator Pattern
 - Iterator Pattern
 - Mediator Pattern
 - Momento Pattern
 - Observer Pattern
 - State Pattern
 - Strategy Pattern
 - Template Pattern
 - Visitor Pattern
- J2EE Patterns
 - DAO Pattern
 - MVC Pattern
 - Service Locator Pattern