



---

| <b>Chapter 1 : Java Fundamentals</b> |   | <b>1-1 to 1-84</b> |
|--------------------------------------|---|--------------------|
| 1.1                                  | Programming Approach from Procedural to Object Orientation (OO) Methodologies ..... | 1-1                |
| 1.2                                  | Comparison of C++ and Java .....  | 1-3                |
| 1.3                                  | Introduction to Object Oriented Programming Methodology .....                       | 1-4                |
| 1.4                                  | Features of Object Oriented Programming (OOP) .....                                 | 1-4                |
| 1.5                                  | Important Terminologies for Object Oriented Programming .....                       | 1-5                |
| 1.6                                  | Java Evolution : History .....  | 1-6                |
| 1.7                                  | Features of Java .....  | 1-7                |
| 1.8                                  | Java Virtual Machine (JVM).....   | 1-8                |
| 1.9                                  | Tokens of Java .....  | 1-9                |
| 1.9.1                                | Character Set of Java .....   | 1-10               |
| 1.9.2                                | Keywords.....   | 1-11               |
| 1.9.3                                | Identifiers.....  | 1-11               |
| 1.9.4                                | Data Types .....  | 1-12               |
| 1.9.5                                | Constants and Variables.....  | 1-13               |
| 1.9.6                                | Escape Sequences.....   | 1-13               |
| 1.9.7                                | Operators.....  | 1-14               |
| 1.9.7(A)                             | Unary Operators .....   | 1-14               |
| 1.9.7(B)                             | Binary Operators .....  | 1-16               |
| 1.9.7(C)                             | Ternary Operator .....  | 1-19               |
| 1.9.7(D)                             | Assignment Operators .....  | 1-19               |
| 1.9.7(E)                             | Selection Operators.....  | 1-20               |
| 1.9.8                                | Precedence and Associativity of Operators.....                                      | 1-20               |
| 1.10                                 | Expressions .....   | 1-22               |
| 1.11                                 | Comments .....  | 1-24               |
| 1.12                                 | Input / Output in Java.....   | 1-24               |
| 1.12.1                               | Displaying Output in Java .....   | 1-24               |
| 1.12.2                               | Accepting Input in Java.....  | 1-25               |
| 1.12.3                               | Accepting Input using BufferedReader Class .....                                    | 1-26               |
| 1.13                                 | First Program of Java.....  | 1-26               |
| 1.14                                 | Installing and Implementing Java.....   | 1-28               |
| 1.14.1                               | Java Development Kit (JDK).....   | 1-28               |
| 1.15                                 | Type Casting and Type Conversion in Java.....                                       | 1-29               |
| 1.16                                 | Solved Programs.....  | 1-30               |
| 1.17                                 | Command Line Arguments .....  | 1-37               |
| 1.18                                 | Introduction to Control Statements .....  | 1-39               |
| 1.19                                 | The for Loop.....   | 1-39               |

---



|        |  |      |
|--------|--|------|
| 1.19.1 | Programs Based on for Loop .....               | 1-40 |
| 1.19.2 | Nested for Loop.....                           | 1-52 |
| 1.20   | while and do-while Loops.....                  | 1-62 |
| 1.20.1 | Programs Based on while and do-while Loop..... | 1-64 |
| 1.21   | The if-else Selective Statement.....           | 1-69 |
| 1.21.1 | Programs using if-else Statement.....          | 1-70 |
| 1.21.2 | if-else Ladder or if-else if.....              | 1-74 |
| 1.22   | Switch-Case Selective Statement .....          | 1-77 |
| 1.23   | Branching Statements (Break and Continue)..... | 1-82 |

---

**Chapter 2 : Classes and Objects****2-1 to 2-28**

|          |  |      |
|----------|--|------|
| 2.1      | Introduction to Objects.....                                       | 2-1  |
| 2.1.1    | State and Behaviour of an Object .....                             | 2-1  |
| 2.1.2    | Introduction to Java Access Modifiers .....                        | 2-1  |
| 2.2      | Java Member Methods .....  | 2-2  |
| 2.3      | Constructors, Destructors, Modifiers, Iterators and Selectors..... | 2-9  |
| 2.3.1    | Constructors.....  | 2-9  |
| 2.3.1(A) | Parameterized Constructor .....                                    | 2-9  |
| 2.3.1(B) | Default Constructor .....  | 2-12 |
| 2.3.1(C) | Copy Constructor.....  | 2-15 |
| 2.4      | Passing Objects to a Method .....                                  | 2-18 |
| 2.5      | Returning Objects from a Method.....                               | 2-20 |
| 2.6      | Call by Value and Call by Reference .....                          | 2-22 |
| 2.6.1    | Call by Value.....   | 2-22 |
| 2.6.2    | Call by Reference .....  | 2-24 |
| 2.7      | Static Class Members.....  | 2-25 |
| 2.8      | The “this” Keyword.....  | 2-26 |

---

**Chapter 3 : Methods and Inheritance in JAVA****3-1 to 3-62**

|       |                                  |      |
|-------|----------------------------------|------|
| 3.1   | Arrays.....                      | 3-1  |
| 3.2   | Multi-dimensional Arrays .....   | 3-12 |
| 3.3   | Strings.....                     | 3-19 |
| 3.3.1 | Methods of String Class .....    | 3-19 |
| 3.4   | Methods in Java .....            | 3-27 |
| 3.5   | Recursive Methods .....          | 3-31 |
| 3.6   | Introduction to Inheritance..... | 3-34 |
| 3.7   | Single Inheritance .....         | 3-35 |
| 3.8   | Multi Level Inheritance.....     | 3-39 |
| 3.9   | Hierarchical Inheritance .....   | 3-43 |



|        |  |      |
|--------|--|------|
| 3.10   | Method Overriding .....                                  | 3-46 |
| 3.11   | Keyword “final” and Final class .....                    | 3-48 |
| 3.12   | Java Abstract Class and Method .....                     | 3-50 |
| 3.13   | Polymorphism.....  | 3-54 |
| 3.14   | Static Polymorphism.....                                 | 3-54 |
| 3.14.1 | Constructor Overloading .....                            | 3-54 |
| 3.14.2 | Method Overloading .....                                 | 3-55 |
| 3.15   | Dynamic Polymorphism.....                                | 3-58 |
| 3.15.1 | Dynamic Method Dispatch.....                             | 3-58 |
| 3.16   | The finalize() Method Instead of Destructor in Java..... | 3-60 |
| 3.17   | The Super Keyword.....                                   | 3-61 |

---

**Chapter 4 : Interfaces and Packages****4-1 to 4-19**

|       |  |      |
|-------|--|------|
| 4.1   | Interface.....                                       | 4-1  |
| 4.1.1 | Introduction .....                                   | 4-1  |
| 4.1.2 | Extending an Interface.....                          | 4-1  |
| 4.1.3 | Variables in Interface .....                         | 4-1  |
| 4.1.4 | Difference between Interface and Abstract Class..... | 4-1  |
| 4.2   | Introduction to Packages.....                        | 4-5  |
| 4.3   | Creating a Package.....                              | 4-6  |
| 4.4   | Creating a Sub-Package .....                         | 4-7  |
| 4.5   | Importing a Package .....                            | 4-9  |
| 4.6   | The java.lang Package .....                          | 4-10 |
| 4.6.1 | Wrapper Classes .....                                | 4-10 |
| 4.6.2 | Other Classes in java.lang.....                      | 4-13 |
| 4.6.3 | Math .....   | 4-14 |
| 4.7   | The java.util Package .....                          | 4-15 |
| 4.7.1 | Date .....   | 4-17 |
| 4.7.2 | Calendar.....  | 4-17 |
| 4.7.3 | Vector .....   | 4-18 |
| 4.7.4 | Hashtable.....                                       | 4-19 |
| 4.7.5 | Collection Classes .....                             | 4-19 |

---

**Chapter 5 : Multithreading and Exception Handling****5-1 to 5-29**

|       |   |     |
|-------|---|-----|
| 5.1   | Introduction to Exception Handling..... | 5-1 |
| 5.2   | Checked and Unchecked Exceptions.....   | 5-1 |
| 5.2.1 | Checked Exceptions.....                 | 5-1 |
| 5.2.2 | Unchecked Exceptions .....              | 5-1 |
| 5.3   | try-catch-finally .....                 | 5-4 |



|       |  |      |
|-------|--|------|
| 5.3.1 | Multiple Try Catch Block.....            | 5-7  |
| 5.3.2 | Nested Try Catch Block.....              | 5-10 |
| 5.4   | Keyword “throws”.....                    | 5-12 |
| 5.5   | Keyword “throw”.....                     | 5-13 |
| 5.6   | Introduction to Threads.....             | 5-16 |
| 5.7   | Making Thread.....                       | 5-17 |
| 5.7.1 | Implementing the Runnable Interface..... | 5-17 |
| 5.7.2 | Extending Thread Class.....              | 5-18 |
| 5.8   | Life Cycle of a Thread.....              | 5-20 |
| 5.8.1 | New Born State.....                      | 5-20 |
| 5.8.2 | Active State.....                        | 5-21 |
| 5.8.3 | Blocked State.....                       | 5-21 |
| 5.8.4 | Dead State.....                          | 5-21 |
| 5.9   | Creating Multiple Threads.....           | 5-21 |
| 5.10  | Thread Methods.....                      | 5-23 |
| 5.11  | Thread Synchronization.....              | 5-26 |

---

**Chapter 6 : Graphics Programming and File Handling****6-1 to 6-21**

|       |  |      |
|-------|--|------|
| 6.1   | Introduction to AWT, Graphics and Swings Packages.....         | 6-1  |
| 6.2   | Graphics Class and its Methods.....                            | 6-2  |
| 6.2.1 | Drawing Lines.....   | 6-2  |
| 6.2.2 | Drawing Rectangles.....  | 6-4  |
| 6.2.3 | Drawing Ovals and Circles.....                                 | 6-5  |
| 6.2.4 | Drawing Arcs.....  | 6-7  |
| 6.2.5 | Drawing Polygons.....  | 6-8  |
| 6.2.6 | Changing Colors.....   | 6-10 |
| 6.3   | Miscellaneous Graphics Programs.....                           | 6-12 |
| 6.4   | File Handling in Java.....                                     | 6-14 |
| 6.5   | Concept of Streams, Stream Classes And Random File Access..... | 6-19 |