

OBJECT ORIENTED PROGRAMMING

CONTENTS

UNIT I INTRODUCTION TO OOP AND JAVA

1.1.	An Overview of Java	1.1
1.2.	Object-Oriented Programming	1.1
1.2.1.	Two Paradigms	1.1
1.2.2.	The Three OOP Principles	1.2
1.3.	Features of OOP Paradigm	1.6
1.4.	The Java Buzzwords	1.7
1.5.	Programming in java	1.10
1.5.1	Java character set	1.10
1.5.2	Java tokens	1.10
1.5.2.1	Keywords	1.10
1.5.2.2	Identifiers	1.11
1.6.	Data Types, Variables, and Arrays	1.11
1.6.1.	Java Is a Strongly Typed Language	1.11
1.7.	Variables	1.18
1.8.	Arrays	1.19
1.8.1.	One-Dimensional Arrays	1.19
1.8.2.	Multidimensional Arrays	1.21
1.8.3.	Alternative Array Declaration Syntax	1.26
1.8.4.	Introducing Type Inference with Local Variables	1.26
1.8.5.	Some var Restrictions	1.28
1.9.	A Few Words About Strings	1.29
1.10.	Operators	1.29
1.10.1.	Arithmetic Operators	1.29
1.10.2.	The Bitwise Operators	1.35
1.10.3.	Relational Operators	1.45
1.10.4	Short-Circuit Logical Operators	1.48
1.10.5.	Operator Precedence	1.50
1.11.	Control Statements	1.52
1.11.1.	Java's Selection Statements	1.52
1.11.2.	Iteration Statements	1.62
1.11.3.	Jump Statements	1.78

1.12.	Structure of a java program	1.86
1.13	Compiling the Program	1.87
1.14	Introducing Classes	1.88
1.14.1.	The General Form of a Class	1.88
1.14.2.	A Simple Class	1.89
1.14.3.	Declaring Objects	1.92
1.14.4.	A Closer Look at new	1.93
1.14.5.	Assigning Object Reference Variables	1.94
1.14.6.	Introducing Methods	1.95
1.14.7.	Returning a Value	1.97
1.15.	Constructors	1.101
1.16.	The this Keyword	1.105
1.17.	Garbage Collection	1.106
1.18	Access Specifiers	1.106
1.19	Static Members	1.110
1.20.	Introducing final	1.113
1.21	JavaDoc comments (Java Documentation Comments)	1.113
1.21.1	Types of comments	1.114
Review Questions and Answers		1.118

UNIT II INHERITANCE, PACKAGES AND INTERFACES

2.1.	Overloading Methods	2.1
2.2.	Overloading Constructors	2.4
2.3.	Using Objects as Parameters	2.7
2.4.	A Closer Look at Argument Passing	2.10
2.5.	Returning Objects	2.12
2.6.	Recursion	2.13
2.7.	Introducing Access Control	2.16
2.8.	Understanding static	2.20
2.9.	Nested and Inner Classes	2.22
2.10.	Inheritance	2.25
2.10.1.	Inheritance Basics	2.25
2.10.2.	Member Access and Inheritance	2.28
2.10.3.	A More Practical Example	2.29
2.11.	A Superclass Variable Can Reference a Subclass Object	2.32

2.12.	super	2.33
2.12.1.	Using super to Call Superclass Constructors	2.33
2.12.2.	A Second Use for super	2.38
2.13.	Creating a Multilevel Hierarchy	3.39
2.14.	When Constructors Are Executed	3.43
2.15.	Method Overriding	2.44
2.16.	Dynamic Method Dispatch	2.47
2.17.	Why Overridden Methods?	2.49
2.18.	Applying Method Overriding	2.51
2.19.	Abstract Classes	2.53
2.20.	Using final with Inheritance	2.55
2.21.	Using final to Prevent Inheritance	2.57
2.22.	Local Variable Type Inference and Inheritance	2.57
2.23.	The Object Class	2.59
2.24.	Packages and Interfaces	2.60
2.25.	Packages	2.60
2.25.1.	Defining a Package	2.60
2.25.2.	Finding Packages and CLASSPATH	2.61
2.25.3.	A Short Package Example	2.62
2.25.4.	Packages and Member Access	2.63
2.25.5.	An Access Example	2.64
2.25.6.	Importing Packages	2.68
2.26.	Interfaces	2.70
2.26.1.	Defining an Interface	2.71
2.26.2.	Implementing Interfaces	2.72
2.26.3.	Accessing Implementations through Interface References	2.73
2.26.4.	Partial Implementations	2.75
2.26.5.	Nested Interfaces	2.75
2.26.6.	Applying Interfaces	2.77
2.26.7.	Variables in Interfaces	2.81
2.26.8.	Interfaces Can Be Extended	2.83
2.26.9.	Default Interface Methods	2.84
2.26.10.	Default Method Fundamentals	2.85
2.26.11.	A More Practical Example	2.87

2.26.12. Multiple Inheritance Issues	2.88
2.26.13. Use static Methods in an Interface	2.89
2.26.14. Private Interface Methods	2.90

Review questions and answers	2.93
-------------------------------------	-------------

UNIT III EXCEPTION HANDLING AND MULTITHREADING

3.1. Exception Handling basics	3.1
3.2. Exception-Handling Fundamentals	3.1
3.3. Exception Types	3.2
3.4. Using try and catch	3.4
3.5. Displaying a Description of an Exception	3.6
3.6. Multiple catch Clauses	3.7
3.7. Nested try Statements	3.9
3.8. throw	3.12
3.9. throws	3.13
3.10. finally	3.14
3.11. Java's Built-in Exceptions	3.16
3.12. Creating Your Own Exception Subclasses	3.18
3.13. Chained Exceptions	3.21
3.14. Three Additional Exception Features	3.23
3.15. Multithreaded Programming	3.24
3.16. The Java Thread Model	3.25
3.17. Thread Priorities	3.26
3.18. Synchronization	3.27
3.19. Messaging	3.27
3.20. The Thread Class and the Runnable Interface	3.27
3.21. The Main Thread	3.28
3.22. Creating a Thread	3.30
3.22.1. Implementing Runnable	3.31
3.22.2. Extending Thread	3.33
3.22.3. Choosing an Approach	3.34
3.22.4. Creating Multiple Threads	3.35
3.22.5. Using <code>isAlive()</code> and <code>join()</code>	3.37
3.22.6 Thread Priorities	3.40

3.23.	Synchronization	3.41
3.23.1.	Using Synchronized Methods	3.41
3.23.2.	The synchronized Statement	3.44
3.24.	Interthread Communication	3.46
3.25.	Deadlock	3.52
3.26.	Suspending, Resuming, and Stopping Threads	3.55
3.27.	Obtaining a Thread's State	3.58
3.28.	Using a Factory Method to Create and Start a Thread	3.59
3.29.	Using Multithreading	3.60
3.30.	Wrappers	3.61
3.31.	Autoboxing	3.64
3.31.1.	Autoboxing and Methods	3.65
3.31.2.	Autoboxing/Unboxing Occurs in Expressions	3.67
3.31.3.	Autoboxing/Unboxing Boolean and Character Values	3.68
3.31.4.	Autoboxing/Unboxing Helps Prevent Errors	3.69
3.31.5.	A Word of Warning	3.70
	Review questions and answers	3.71

UNIT IV: I/O, GENERICS, STRING HANDLING

4.1.	I/O Basics	4.1
4.2.	Reading and Writing Console I/O	4.4
4.2.1.	Reading Console Input	4.4
4.2.2.	Writing Console Output	4.7
4.3.	Reading and Writing Files	4.9
4.4.	Generics: Generic Programming	4.17
4.5.	A Generic Class with Two Type Parameters	4.25
4.6.	Bounded Types	4.26
4.7.	Using Wildcard Arguments	4.28
4.8.	Bounded Wildcards	4.32
4.9.	Creating a Generic Method	4.37
4.10.	Restrictions and Limitations	4.42
4.11.	Strings: basic String Class, Methods	4.44
4.11.1.	The String Constructors	4.45
4.11.2.	Special String Operations	4.47

4.11.3.	Character Extraction	4.50
4.11.4.	Searching Strings	4.56
4.11.5.	Modifying a String	4.57
4.11.6.	Data Conversion Using valueOf()	4.60
4.11.7.	Changing the Case of Characters Within a String	4.60
4.11.8.	Joining Strings	4.61
4.11.9.	Additional String Methods	4.62
4.12.	Stringbuffer Class	4.63
	Review Questions and Answers	4.71

UNIT V: JAVA FX EVENT HANDLING, CONTROLS AND COMPONENTS

5.1.	Javafx events and Controls	5.1
5.2.	Handling Key and Mouse Events Controls	5.6
5.3.	Checkbox	5.12
5.4.	Toggle Button	5.20
5.5.	Radio Buttons	5.22
5.6.	List View	5.26
5.7.	Combobox	5.34
5.8.	Choicebox	5.37
5.9.	Text Controls	5.39
5.10.	Scrolpane	5.43
5.11.	Layouts	5.47
5.11.1.	FlowPane	5.47
5.11.2.	Hbox and VBox	5.49
5.11.3.	BorderPane	5.52
5.11.4.	StackPane	5.55
5.11.5.	GridPane	5.56
5.12.	Menus - basics - Menu - Menu Bars - MenuItem	5.59
5.12.1.	Menu Basics	5.59
5.12.2.	An Overview of MenuBar, Menu, and MenuItem	5.61
5.13.	Create a Main Menu	5.63
5.13.1.	Add Mnemonics and Accelerators to Menu Items	5.68
5.13.2.	Add Images to Menu Items	5.70
5.13.3.	Use RadioMenuItem and CheckMenuItem	5.71
	Review Questions and Answers	5.74