

Java Programming with Eclipse

Section	Title	Page
One	Introduction to Java	2
	– Usage of Java	3
	– Structure of Java	4
	– Flexibility of Java Programming	5
	– Using the Eclipse Software	6
Two	Running Java in Eclipse	7
	– Introduction	8
	– Using Eclipse	9
	– Workspace Launcher	11
	– Workspace in Eclipse	16
	– Projects in Eclipse	17
	– Opening Projects in Eclipse	18
	– Importing Projects in Eclipse	19
	– Running Projects in Eclipse	24
	– Viewing results in the Eclipse Console	25
	– The Eclipse Console properties	27
Three	Setting up a machine to use Eclipse	28
	– Introduction	29
	– Downloading the JDK	30
	– Installing the Java Developer Kit	33
	– Downloading Eclipse	37
Four	First Steps to Programming in Java	41
	– Introduction to Java Programming	42
	– Anatomy of Java Programming	43
	– Using System.out.println in Java	47
	– Passing Arguments in a Java Program	49
	– Packages in Java Programming	50
	– Naming Java modules	51
	– Commenting in Java Programs	52
	– Editing Java in Eclipse	53
	– The SRC folder	55
	– Editing the code in the SRC	57
– Examining the Workspace Folder	59	
– Examining the Workspace	60	
Five	Creating Projects and Classes in Eclipse	62
	– Introduction	63
	– Creating Projects	64
	– Importing Projects	68
	– Importing Projects from other Folders	69
	– Importing Archives into Workspace	73
	– Exporting a Project	76
	– Deleting Projects	80
	– Creating Packages	81
	– Creating Classes	84
	– Exporting Classes into Projects	89

Java Programming with Eclipse

Section	Title	Page
	– Importing Classes into Projects	90
	– Copying Classes	93
	– Incorporating Existing Classes	95
Six	Using the Java Editor in Eclipse	96
	– Introduction	97
	– Folding	99
	– Line Numbers	101
	– Creating Bookmarks	102
	– Using Bookmarks	103
	– Using Tasks	107
	– Correcting Errors	112
	– Syntax Rules	113
	– Error Checking	114
	– Colour Coding	116
	– Hints while typing	117
	– Bracket Location	119
	– <i>Exercise One</i>	120
Seven	Java Strings	122
	– Introduction	123
	– Using Escape Characters	124
	– Concatenating of Strings	127
	– Using Methods with Strings	130
	– Using the Java Editor with Methods	131
	– Methods with Parameters / Arguments	134
	– Selecting Substrings	136
	– Finding the Index	137
	– Finding the Index of a Substring	139
	– Finding the Length of a String	142
	– Capitalizing Strings Example	143
	– <i>Exercise Two</i>	144
Eight	Using Numbers in Java	147
	– Performing Calculations	148
	– Calculations and Concatenation	150
	– Calculations and Precedence	152
	– Using Concatenation with Numbers	153
	– Using Methods with Numbers	155
	– <i>Exercise Four</i>	158
Nine	Creating Variables in Java	159
	– Introduction	160
	– Naming Conventions	162
	– Using Final to create a Constant value	166
	– Primitive Datatypes	168
	– byte Datatype	169
	– long Datatype	170
	– short Datatype	172
	– int Datatype	173
	– float Datatype	174
	– double Datatype	175

Java Programming with Eclipse

Section	Title	Page
	– Compatibility between Primitive Datatypes	176
	– Casting between Primitive Datatypes	177
	– Casting and Converting Values	178
	– byte Casting	179
	– double Casting	180
	– int Casting	181
	– long Datatype	182
	– float Casting	183
	– short Casting	184
	– char Datatype	185
	– char Casting	186
	– String Casting	187
	– boolean Datatype	188
	– Manipulating Variables	189
	– Incrementing Variables with Postfix	193
	– Postfix versus Prefix	194
	– Number Formatting in Java	195
	– <i>Exercise Four</i>	203
Ten	Wrapper Classes in Java	207
	– Introduction	208
	– Using MAX_VALUE	210
	– Declaring Wrappers	211
	– Populating Wrapper Classes	212
	– Postfix Wrappers	215
	– Number Formatting	216
	– Converting Numeric Wrappers	217
	– Converting Numeric Wrappers to String	218
	– String to Numeric Datatypes (decode)	219
	– String to Numeric Datatypes (parseInt)	220
	– String to Numeric Datatypes (valueOf)	221
	– Numeric Datatypes to String using valueOf()	222
	– Character Class Methods in Java	223
	– Converting String to char	224
	– <i>Exercise Five</i>	225
Eleven	Conditional Tests	227
	– Making Decisions in Java	228
	– Testing Booleans in Java	235
	– Else Conditions in Java	237
	– Else if Conditions in Java	238
	– Nesting Conditions in Java	239
	– Ternary if-else Operator	240
	– Case Switch Conditions	242
	– Using Break in Java Switches	244
	– Using Java Switches with Strings (v7+)	246
	– Using Java Switches with Bytes (v7+)	247
	– Using Java Switches with Shorts (v7+)	248
	– Using Java Switches with Wrappers (v7+)	249
	– Compound Conditions in Java	250

Java Programming with Eclipse

Section	Title	Page
	– AND Conditions in Java (&&)	251
	– OR Conditions in Java ()	252
	– XOR Conditions in Java (^)	253
	– Short-circuiting Conditions in Java	254
	– <i>Exercise Six</i>	256
Twelve	Conditional Tests with Wrappers	260
	– Class Conditions	261
	– Class Methods	263
	– String Class Methods	264
	– Character Class Methods	266
	– Boolean Class Methods	268
	– <i>Exercise Seven</i>	269
Thirteen	Arrays	271
	– Array Variables in Java	272
	– Declaring Arrays in Java ([])	273
	– Using copyOf to extend an array	277
	– Declaring Empty Arrays in Java ([])	278
	– Populating Arrays in Java	279
	– Multi-Dimensional Arrays	280
	– Defining Multi-Dimensional Arrays	281
	– Populating Multi-Dimensional Arrays	283
	– Cloning Arrays	285
	– Converting Char Arrays to Strings	286
	– Sorting Arrays	288
	– <i>Exercise Eight</i>	289
Fourteen	Object	292
	– The Object Superclass in Java	293
	– Creating and utilising Objects	294
Fifteen	Looping	295
	– Looping Methods in Java	296
	– While Looping in Java	297
	– Do While Looping in Java	299
	– For Looping in Java	300
	– For-Each Looping in Java	301
	– Terminating a Loop in Eclipse	302
	– Nested Looping in Java	303
	– Branching in Looping in Java	304
	– Continue Looping in Java	305
	– Break Looping in Java	307
	– Labelling Looping in Java	308
	– The Break Statement in Java	309
	– Breaking with a Loop Label	310
	– Continuing with a Loop Label	311
Sixteen	Passing Arguments in Eclipse	312
	– Sending Arguments to Methods	313
	– Using Eclipse to pass arguments	315
	– Using length with arguments	318
	– <i>Exercise Nine</i>	319

Java Programming with Eclipse

Section	Title	Page
Seventeen	Multiple Methods	324
	– Introduction	325
	– Multiple Methods	326
	– Overloading	331
	– Returning Values in Java	335
	– Returning Wrappers in Java	342
	– Returning Arrays in Java	343
	– Using varargs in Java	344
	– Definition of scope	345
	– <i>Exercise Ten</i>	348
Eighteen	Multiple Classes	350
	– Multiple Classes / Single File	351
	– Multiple Classes	353
	– Accessing Variables	354
	– Nested Classes	355
	– Finalising Class Variables	359
	– Accessing from other Classes	361
– <i>Exercise Eleven</i>	363	
Nineteen	Packages	367
	– Introduction	368
	– Definition of a Package	369
	– Multi-Level Packages	370
	– Accessing and Importing Packages	375
	– Classes outside Packages	381
	– <i>Exercise Twelve</i>	383
Twenty	Regular Expressions in Java	384
	– Introduction	385
	– Line Anchors	388
	– Case Sensitivity	389
	– Using the Dot (Any Character)	390
	– Counting Characters {Intervals}	392
	– Character Range Lists	395
	– Excluding Character Lists	399
	– Metacharacters in Java	400
	– Or Patterns (Alternatives)	402
	– Using the Question Mark (Optional)	403
	– Using the Plus sign (Mandatory)	405
	– Using the Star sign (Optional)	406
	– Negative Lookahead	407
	– POSIX in Java	408
	– Using String methods for Regex – matches()	410
– Using String methods for Regex – replaceAll()	411	
– Using String methods for Regex – replaceFirst()	412	
– Using String methods for Regex – split()	413	
– <i>Exercise Thirteen</i>	415	

Java Programming with Eclipse

Section	Title	Page
Twenty One	Vectors	420
	– Using Vectors in Java	421
	– Populating Vectors using add() method	422
	– Populating Vectors using addAll() method	423
	– Counting number of values in a Vector	425
	– Accessing values in a Vector	426
	– Using Loops with Vectors	427
	– Changing existing values in a Vector	428
	– Sorting values in a Vector	429
	– Miscellaneous methods to use with Vectors	430
	– Using Vectors in Java	431
Twenty Two	Hashtables	432
	– Creating Hashtables	433
	– Populating Hashtables	434
	– Accessing values in a Hashtable	435
	– Accessing values in Hashtables with For-Each	436
	– Some useful methods for Hashtables	437
Twenty Three	Enumeration	438
	– Introduction	439
	– Using Enumeration	440
Twenty Four	Concepts of OOPS	442
	– Introduction	443
	– Classes and Instances (Instantiation)	444
	– Constructor	445
	– Polymorphism	448
	– Inheritance	450
	– IS-A	452
	– Overriding and Overloading	453
	– Extends	454
	– Interfaces and Implementation	455
	– Abstraction	456
– Encapsulation	457	
– Packages	458	
Twenty Five	Interfaces	459
	– Introduction	460
	– Implementing Interfaces	461
	– The Hierarchy of Interfaces Using Extends	465
	– The purpose of @Override	468
Twenty Six	Access Methods in Java	469
	– Class Access Levels in Java	470
	– Method Access Levels in Java	471
	– Variable Access Levels in Java	474
Twenty Seven	Using OOPS in Java	475
	– Introduction	476
	– Instances and Constructors	477
	– Instances and Constructors across Packages	480
	– The 'This' keyword	481
	– Overriding and Extending Classes	488

Java Programming with Eclipse

Section	Title	Page
	– Using the Super keyword	496
	– <i>Exercise Fourteen</i>	497
Twenty Eight	Exception Handling in Java	503
	– Error Handling in Java	504
	– Trying Exceptions in Java	505
	– Catching Exceptions in Java	506
	– Throw Exceptions in Java	513
	– Using Finally in Java	516
	– Throws and Modular Programming	518
	– <i>Exercise Fifteen</i>	529
Twenty Nine	Using Java Swing with Eclipse	530
	– Introduction	531
	– Using Dialog Boxes	532
	– Using Message Dialogs	534
	– Using Confirm Dialogs	539
	– Using Input Dialogs	542
	– Using Icons in Java	544
	– Using ImageIcon in Java	545
	– Using Option Dialogs	546
	– Making a Beep in Java	552
	– <i>Exercise Sixteen</i>	553
Thirty	Enums	556
	– Introduction	557
	– Declaring a basic Enum	558
	– Testing Enums	562
	– Using the values() method with Enums	563
	– Creating methods in Enums	564
	– <i>Exercise Sixteen</i>	570
Thirty One	HashMaps	572
	– Creating HashMaps	573
	– Populating HashMaps	574
	– Populating HashMaps using putAll()	575
	– Accessing values in HashMaps	576
	– Accessing values in HashMaps with For-Each	577
	– Accessing keys in HashMaps with For-Each	578
	– Some useful methods for HashMaps	579
Thirty Two	Arraylist	580
	– Creating ArrayLists	581
	– Populating an ArrayList	583
	– Populating an ArrayList with addAll	585
	– Counting number of values in an ArrayList	586
	– Accessing values in an ArrayList	587
	– Using Loops with ArrayLists	588
	– Changing existing values in an ArrayList	589
	– Sorting values in an ArrayList	590

Java Programming with Eclipse

Section	Title	Page
Thirty Three	Iterator	591
	– Introduction	592
	– Using Iterator	593
	– Using Iterator with remove()	594
	– Using ListIterator	595
	– <i>Exercise Eighteen</i>	596
Thirty Four	Dates in Java	600
	– Using Dates in Java	601
	– Date and Time Variables	603
	– currentTimeMillis()	605
	– DateFormat in Java	606
	– Placing Strings into Dates	609
	– SimpleDateFormat Method	611
	– getTimeInstance Method in Java	614
– SimpleDateFormat Method for Time in Java	617	
Thirty Five	Calendars in Java	619
	– Calendar Class in Java	620
	– Leniency in Calendars	625
	– Populating Calendars	626
	– Populating Calendars using set()	628
	– Changing Calendars using add()	629
	– Gregorian Calendar in Java	631
– <i>Exercise Nineteen</i>	635	
Thirty Six	System Properties	638
	– Using System Properties in Java	639
	– List of System Properties in Java	640
	– System.getProperty	641
Thirty Seven	File Handling in Java	642
	– File Handling in Java	643
	– Reading from Files in Java	645
	– Using the Buffered Reader	649
	– Writing to Files in Java	651
	– Using the BufferedWriter in Java	653
– <i>Exercise Twenty</i>	654	
Thirty Eight	Reading XML Files	656
	– Introduction	657
	– Reading XML in Java	658
	– Getting the Elements of the File	659
Thirty Nine	Reading and Writing Zip Files in Java	665
	– Introduction	666
	– Counting Files in a Zip File	667
	– Naming Files in a Zip File	668
	– Reading Contents of a Zip using Enumeration	669
	– Reading Contents of a Zip using a ZipEntry	671
	– Writing to a Zip File	673

Java Programming with Eclipse

Section	Title	Page
Forty	Accessing MySQL Databases in Java	676
	– Introduction	677
	– Incorporating MySQL into Projects	678
	– Using MySQL	683
	– Counting Records in MySQL	684
	– Displaying Records in MySQL	687
	– Using the 'get' method with the ResultSet	689
	– Updating records in MySQL	690
	– Deleting and Inserting records in MySQL	692
	– Date Formats for MySQL	693
	– Performing DDL in MySQL with Java	694
	– Creating, Altering and Dropping MySQL Tables	695
	– Running Java and MySQL on the Command Line	697
	– <i>Exercise Twenty One</i>	700
Forty One	Accessing Oracle Databases in Java	706
	– Introduction	707
	– Incorporating Oracle into Projects	708
	– Using Oracle	713
	– Counting Records in Oracle	714
	– Displaying Records in Oracle	717
	– Updating records in Oracle	719
	– Deleting and Inserting records in Oracle	721
	– Inserting / Updating Dates in Oracle	722
	– Performing DDL in Oracle with Java	723
	– Creating, Altering and Dropping Oracle Tables	724
	– Running Java and Oracle on the Command Line	726
	– <i>Exercise Twenty Two</i>	729
	Forty Two	Developer Defined Exceptions
Forty Three	Creating JAR files in Eclipse	742
	– Introduction	743
	– Creating a JAR file in Eclipse	744
Forty Four	Using Javadoc in Eclipse	748
	– Documenting Java Programs	749
	– Using Javadoc	750
	– Using Javadoc for classes	751
	– Using Javadoc for methods	752
	– Javadoc Tags	753
	– Suggestions for Class documentation	754
	– Using HTML with Javadoc	755
– Generating Javadoc in Eclipse	758	
	– <i>Exercise Twenty Three</i>	769