

Java 1.8 Programming with Eclipse Neon

| 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 |
| – Introduction | | 29 |
| – Downloading the JDK | | 30 |
| – Installing the Java Developer Kit | | 33 |
| – Downloading Eclipse | | 37 |
| Four | – Installing Eclipse | 39 |
| | 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 |
| | – 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|--------------|---|------|
| | – 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 |
| | – 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|-----------------|---|------------|
| | – 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 |
| | – 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|------------------|---------------------------------------|------|
| | – 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 |
| 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|---------------------|---|------|
| | – 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 |
| 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|---------------------|--|------|
| | – 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 |
| | – 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|---------------------|--|------|
| | – 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 |
| 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 |

Java 1.8 Programming with Eclipse Neon

| Section | Title | Page |
|--------------------|---|------|
| | – Reading Contents of a Zip using Enumeration | 669 |
| | – Reading Contents of a Zip using a ZipEntry | 671 |
| | – Writing to a Zip File | 673 |
| 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 | 735 |
| 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> | 767 |