Java Tutorial – Mastery Factor Mappings

This document shows which Lessons in the Java tutorial provide skills matching the Mastery Factors :

**Standard Level**

1. Arrays **(Lesson 18)**
2. User-defined objects **(Lesson 15)**
3. Objects as data records **(Lesson 15)**
4. Simple selection (if–else) **(Lesson 9)**
5. Complex selection (nested if, if with multiple conditions or switch) **(Lesson 10)**
6. Loops **(Lessons 11-12)**
7. Nested loops **(Lessons 11-12)**
8. User-defined methods **(Lesson 15)**
9. User-defined methods with parameters (the parameters have to be useful and used within the method body) **(Lesson 16)**
10. User-defined methods with appropriate return values (primitives or objects) **(Lesson 21-22)**
11. Sorting (**(Lesson 41))**
12. Searching (**(Lesson 51))**
13. File i/o **(Lesson 24-26)**
14. Use of additional libraries (such as utilities and graphical libraries not included in appendix 2

Java Examination Tool Subsets) **(Use of Eclipse for GUI)**

1. Use of sentinels or flags **(easy!)**

**Higher Level**

1. Adding data to an instance of the RandomAccessFile class by direct manipulation of the file

pointer using the seek method

1. Deleting data from an instance of the RandomAccessFile class by direct manipulation of the

file pointer using the seek method. (Data primitives or objects may be shuffled or marked as

deleted by use of a flag field. Therefore files may be ordered or unordered).

1. Searching for specified data in a file.
2. Recursion
3. Merging two or more sorted data structures
4. Polymorphism
5. Inheritance
6. Encapsulation
7. Parsing a text file or other data stream
8. Implementing a hierarchical composite data structure. A composite data structure in this

definition is a class implementing a record style data structure. A hierarchical composite data structure is one that contains more than one element and at least one of the elements is a composite data structure. Examples are, an array or linked list of records, a record that has one field that is another record, or an array.

1. The use of any five standard level mastery factors—this can be applied only once
2. – 15. Up to four aspects can be awarded for the implementation of abstract data types (ADTs) according to the table entitled “Implementation of ADTs”.

An ADT may be implemented as a class or interface containing data members and methods

appropriate to that ADT. The number of mastery aspects to be awarded will depend on

the thoroughness and correctness of the student’s implementation. Examples are given in the following table.

1. Use of additional libraries (such as utilities and graphical libraries not included in appendix 2

Java Examination Tool Subsets)

1. Inserting data into an ordered sequential file without reading the entire file into RAM.
2. Deleting data from a sequential file without reading the entire file into RAM.
3. Arrays of two or more dimensions.