**Iterations and Transformations on Sequence’s**

**Document Id 1**

**Top Level Learning Goals**

1 Understand Iterations Types (counting loops, Iterators) for the Java Programming Language

2 Understand the issues to overcome when implementing Algorithms with these Types

**Section 1**

**Iterations**

**Learning Objectives**

* Loops and Nested Loops
* Counting in Nested Loops
* Java 8 Streams for Loops and Nested Loops
* Issues with variables in Java 8 Streams Lambda expressions

**Section 1 Guided Learning Tasks**

* Factorial Example
* Nested Loop Count condition Example
* Count condition Loops with Java 8 Streams

**Lab 1 Review Questions**

**Lab 1 Practical**  **Count Condition Loops with Java 8 Streams**

**Lab 1 Solution**

**Section 2**

**Iterations with Java Collections**

**Learning Objectives**

* Transformations on sequences for the Java Programming Language
* Iteration Loops for Lists, Sets and Maps
* Collection Iterator How to use it
* When to use the Iterato**r**

**Section 2 Guided Learning Tasks**

* Transformations on sequences
* Enhanced for loop with Lists
* Iterator

**Lab 2 Review Questions**

**Lab 2**  **Practical LinkedList Unsafe iteration on Queues**

**Lab 2 Solution**

**Section 3**

**Iterations with Java Maps and Streams**

**Learning Objectives**

* Difference between Java Maps and Collections
* Iterating on Maps
* Map values Collection Type
* Obtaining Common Sequence Algorithms from Java 8 Streams
* Algorithms: Clone, Projection, Transformation, Reduction, Mapreduce, Group By

**Section 3 Guided Learning Tasks**

* Underlying Map Collections
* Transform Map Value Collection to a List
* Iterating on Map
* Common Sequence Algorithms

**Lab 3 Review Questions**

**Lab 3**  **Practical Matching Pattern Sequences with iterations**

**Lab 3 Solution**

**Further Reading**

<http://biojava.org/>

<https://github.com/biojava/biojava>

https://github.com/biojava/biojava-tutorial

http://biojava.org/wikis/BioJava:CookBook:Core:Overview/