

# Algorithms in Bioinformatics I, WS2002/3

## Assignment sheet # 7

Daniel Huson

November 25, 2002

In the three following problems, the goal is to implement a class `PhylogeneticTree` that can

1. read a phylogenetic tree in Newick format,
2. write a phylogenetic tree in Newick format, and
3. compute and draw an embedding of a phylogenetic tree.

The `PhylogeneticTree` class is derived from `jloda.graph.Graph`, which is a general graph implementation. Additionally, it makes use of `jloda.graphview.GraphEditor` that is used to draw the computed embedding.

To solve the problems below, please download the following file:

[www-ab.informatik.uni-tuebingen.de/teaching/ws02/abi1/programs/program09.zip](http://www-ab.informatik.uni-tuebingen.de/teaching/ws02/abi1/programs/program09.zip). This download also contains all necessary `jloda` classes and their documentation. Please run the program on all supplied data sets.

The problems are solved by modifying the file `PhylogeneticTree.java`. The file `Program9.java` should not be modified (except for addition of your name, please).

### 1 Reading phylogenetic trees in Newick format (3 points)

Implement the `ParseNewick( $i, j, v$ )` algorithm.

### 2 Writing phylogenetic trees in Newick format (3 points)

Implement the `ToNewick( $e, v$ )` algorithm.

### 3 Drawing a phylogenetic tree (4 points)

Implement the `ComputeEmbedding` algorithm.

### Additional useful activities

Modify your code so that edge lengths are also input and output.

**Due by 10am, Monday, 2 Dec 2002**