Zach Forster

CS 335

DNA Alignment

The DNA alignment was much easier than the QuickHull/MergeHull assignment. In fact, I did not have a single reportable problem after figuring out what I actually had to do. I appreciated the fact that you cited the source of the string alignment images in your PowerPoint, because that Web site has a very clear explanation of the process. I was originally under the impression that the key when tracing back through the table was to look at the stored weight values to the left, to the upper left, and above the current cell and pick the one with the highest value every time. This worked for the most part in the example, and I just assumed that the one place where it didn't work was a typo (a bad assumption, as it turns out). Anyway, the Web site helped me to sort that confusion out.

I was easily able to build up the initial table without actually understanding the problem (as you have repeatedly told us we would notice). However, I believe that I was able to understand everything by the time I had worked through the backtracing code. The threading was fairly simple, because it was exactly what you went through in class (although, having said that, it would be pretty embarrassing if I messed that part up). Finally, I noticed that many implementations of this algorithm construct a second table (somewhat like a vector field) of directions to follow, simplifying the traceback step. I considered this, but I believe that the number of operations to be performed remains the same, and my single-table implementation doesn't require that extra allocation, which may be important when aligning substrings of massive strings. Apart from that, I don't believe that I did anything out of the ordinary.

I enjoyed this assignment, although not as much as the MergeHull assignment. I do think that working out how to use dynamic programming to solve a problem is trickier than writing a divide and conquer algorithm. However, debugging is quite simple without recursion. Hopefully I'll run into some string alignment problems sometime in my life!