This assignment is a programming project. The goal is to implement some algorithm related to the algorithms we have discussed in class. You should work in groups of one to three. You need to submit running code and a writeup describing the algorithm you used, any serious difficulties you came across, any optimizations, and some timings. The report should be 3-5 pages including any tables and figures. If you use any code or code snippets from elsewhere they need to be cited in the report.
Here are a list of possible projects.

1. A parallel version of the PPM algorithm for text compression. The algorithm does not need to generate exactly the same compressed file as the sequential algorithm. For example you can batch the updates. You don't need to implement your own arithmetic coder.

2. Generate a suffix array in parallel.

3. Generate suffix trees.

4. Calculate the edit distance between two strings in parallel using $O(nm)$ work and $O(n+m)$ span and space.

5. Implement the Callahan-Kosaraju algorithm and use it to find all nearest neighbors. Ideally this should be parallel.

6. Implement cover trees and use it to find all nearest neighbors. Ideally this should be parallel.

7. Implement Collision detection using BVHs. Ideally this should be parallel.

8. Implement an I/O efficient sort and run it on data that does not fit in memory. Use this to implement list-ranking or some other pointer-based algorithm.

9. Implement an I/O efficient priority queue and use it to find shortest paths on a DAG. You can assume the DAG is already topologically sorted.

10. Other problems you suggest of a similar nature. This can be related to your research, but must be original code for the project. You need to ask us to use this option.