CSCI 5020 External Memory Data Structures: Assignment 1

Due Day: Oct 29, 2014

Please write down your solution in latex, and submit a pdf. Grading will be done based on:

1. Whether your solution is correct. You receive 0 mark if it is not.

2. The quality of your writing.

Problem (Bundled Predecessors). Let $S_1, ..., S_{\sqrt{B}}$ be $\sqrt{B}$ sets of integers. Given a value q, a query reports the predecessor of q in every S_i ($1 \leq i \leq \sqrt{B}$), namely, $\sqrt{B}$ predecessors need to be output. Describe a structure that consumes $O(N/B)$ space, and answers a query in $O(\log_B N)$ I/Os, where $N = \sum_i |S_i|$.