6.851: Advanced Data Structures, Fall 2017

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$$\boxed{\textbf{Problem Set 6}}$$

Due: Wednesday, October 18, 2017 at noon

Problem 6.1 [Cache-oblivious Maximal Points in 3D].

Describe a cache-oblivious algorithm which takes N distinct points in 3D space and returns a list of all *maximal* points. A point (x, y, z) is *maximal* if there is no other point (x', y', z') such that $x' \geq x$, $y' \geq y$, and $z' \geq z$; in other words, (x, y, z) is not *dominated* by any other point. Your algorithm should run in $O(\text{sort}(N, M, B)) = O(\frac{N}{B} \log_{M/B} \frac{N}{B})$ memory transfers, under the tall-cache assumption.