HW 2, Due March 7.

1. Design and analyze a fast randomized algorithm to check if $AB = C$ for $n \times n$ matrices $A, B, C$.

2. Extend Rabin’s closest pairs algorithm to three dimensions and analyze its expected performance.

3. Show that the maximal matching based algorithm for Vertex Cover cannot give a better than factor 2 approximation.

4. Given $n$ sets $S_1, \ldots, S_n$ over universe $1, \ldots, m$, and an integer $k$. Pick $k$ sets to maximize their union size. Design an approximation algorithm for this problem.