

Exercise 6 - More PRAM Algorithms

Deadline: 19th May, 2009

- 6-1 Given a graph $G(V, E)$, we define a vertex $v \in V$ to be good if it has at least $d(v)/3$ neighbors of degree no more than $d(v)$; otherwise the vertex is considered bad. An edge is good if at least one of its end-points is a good vertex. Show that for any graph $G(V, E)$, the number of good edges is at least $|E|/2$.
- 6-2 **Maximal Matching:** A maximal matching in a graph is a matching that is not properly contained in any other matching. Give a randomized PRAM algorithm for finding a maximal matching in a graph in expected poly-logarithmic time with polynomial number of processors.
- 6-3 (Optional) Show that the algorithm **BoxSort** runs in time $O(\log n)$ with high probability.