Problem Set 7

Due: In class on Wednesday, April 7. Starred problems are optional.

Problem 7-1. Show that if d is an exact power of 2, then the 2^d-node cube-connected-cycles network is a subgraph of the 2^d-node hypercube.

Problem 7-2. Show that the bisection width of an N-node butterfly network is $\Theta(N/\lg N)$. (*Hint:* Use the technique of embedding a complete graph in the network.)

Problem 7-3. Prove that an n-input Beneš network can simulate any n-node, degree-d network off-line in $O(d \lg n)$ time. (*Hint:* Show that any graph of degree-d can be edge-colored with $d + 1$ colors.)

Problem 7-4. * Prove that an N-node linear array can be embedded with dilation 3 into any N-node connected graph.