

Assignment Sheet 3

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Exercise 8. (*from last sheet*)

Consider the following modification to the bit-fixing routing algorithm for routing a permutation on the hypercube. Suppose that, instead of fixing the bits in order from 1 to n , each packet chooses a random order, independently, and fixes the bits in that order. Show that there exists a permutation for which this algorithm requires $2^{\Omega(n)}$ steps with high probability.

Exercise 10.

Show that the expected number of packets that traverse any edge on the path of a given packet when routing a random permutation on the wrapped butterfly network of $N = n \cdot 2^n$ nodes is $\Omega(n^2)$.