

## Theory of Network Communication

Fall 2002

### Assignment 10

**Problem 22** (8 points):

The original Chord network has the drawback that nodes can have degrees as large as  $\Theta(\log^2 n)$ . This can happen if a node owns a range of size  $\Omega((\log n)/n)$  in the  $[0, 1)$  interval, and such a node exists with high probability. In order to reduce the degree to  $O(\log n)$  for every node, one can use the SHARE strategy instead of the nearest neighbor strategy to connect nodes. When using the SHARE strategy, each node is assigned to an interval of length  $(c \log n)/n$  for a sufficiently large, fixed constant  $c$ . Suggest a way of how to execute requests for inserting and deleting a node in Chord in this case.