

Parallel Computing 18.1.2010

1. (a) Construct the table *Dif* corresponding to the pattern *aabababb* to be used in the tournament based string matching algorithm. (2p)
(b) Arrange a tournament corresponding to the pattern of the previous problem among the four first letters in the string *baabababbabbaa*. (2p)
2. Present and analyze the randomized parallel algorithm for finding the connected components of a graph. (4p)
3. (a) Present the “exact” form of Chernoff bounds (2p)
(b) A die (“noppa” in Finnish) is thrown 100 times. Use Chernoff bounds to estimate getting point sum higher than 420. (Exact numeric calculation is not required.) (2p)
4. Give short and exact answers to the following questions:
 - (a) What is the Nick’s Class NC? (1p)
 - (b) What are oblivious algorithms? (1p)
 - (c) What is the message passing model of parallel computation? (1p)
 - (d) What is the 1-collision or the OCPC assumption? (1p)