University of the Saarland
Department 6.2 - Informatik
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Computer Architecture III - WS 03

(due: 11/28/2003)

Excercise 1: (Fault tolerance of permutation networks) **(3 + 4 points)**

1. Suppose in a permutation network as constructed in the lecture one switch gets stuck in the position *forward* or *cross*. Show that the resulting network is still a permutation network.
2. Fix the position of as many switches as possible in a $P(n)$ permutation network such that the resulting network is still a permutation network. How many switches can you fix? Why?

Excercise 2: (Routing algorithm for permutation networks) **(3 points)**

Route the permutation $(1, 3, 6, 0, 2, 5, 7, 4)$ on the permutation network presented in the lecture using the routing algoritm presented in the lecture.

Excercise 3: (Binary comma) **(2 + 3 points)**

1. Make a definition of u' such that

$$|u'| = |u| + log|u| + O(loglog|u|).$$

2. How short can you makle u'? Why?