CSE 531

Homework-1

1. The Butterfly Network is a multi-stage interconnection network composed of *log p* levels (as the Omega network). In this network, each switching node *i* at level *k* is connected to the identically numbered element at level *k+1* and to a switching node whose number differs from itself only at the *k*th most significant bit. Therefore, switching node S_i is connected to element S_j at level *k* if $j = i$ or $j = i \oplus (2^{logp-k})$, where $\oplus$ denotes XOR.

(a) Draw a Butterfly Network with 8 processing elements.

(b) Can you rearrange the switches of an Omega Network so that it looks like a Butterfly Network? If you can do that, what does it mean?

2. Can you give the sketch of a computer program that can figure out the cache capacity of the underlying machine?