Spring Semester, 2007

Problem #1

Due Date: Thursday, February 22

Theorem 1 Given a set of n processors that are at distance d from each other, the worst case clock skew is $\Omega(d(1 - 1/n))$.

Proof: Let $A$ be a CS algorithm. Let $\alpha$ be an execution of $A$ in which the delay of all messages from $p_i$ to $p_j$ is 0, if $i < j$ and $d$, if $i > j$. Let algorithm $A$ have skew $\epsilon$.

This proof is completed using the following lemma. Prove the lemma and then complete the proof.

Lemma 2 For any $k$, $1 \leq k \leq n - 1$, $L_{k-1}(t) \leq L_k(t) - d + \epsilon$. 

$\blacksquare$