CS 185	Homework #1	Assigned April 9, 1999
Spring 1999		Due: April 20, 1999

1. Show that the analysis of list scheduling for $P||C_{\max}$ is tight by giving a class of examples on which list scheduling produces a schedule of length $\left(2 - \frac{1}{m}\right) C^*_{\max}$.

2. Prove that if an input to $P||C_{\max}$ has the property that, for all jobs j, $p_j > \frac{C^*_{\max}}{3}$, then LPT gives an optimal schedule.

3. If we add release dates to each job, we get $P|r_j|C_{\max}$. We can extend list scheduling in this case. If, at time t a machine M is idle, and there is an unprocessed job with $r_j \geq t$, then we schedule j on M at time t. Analyze the performace of this algorithm.

4. Analyze the performance of list scheduling on $Q||C_{\max}$. Recall that in this problem, each machine M_i has a speed s_i. Your bound may depend on the values of the s_i, particularly something like the ratio between $s_{\min}$ and $s_{\max}$, the minimum and maximum machine speeds.

5. Consider $P3|prec, p_j = 1|C_{\max}$. Give the best approximation algorithm you can for this problem. (Note that it is not known whether this problem is NP-complete).