CS 185	Homework #3	Assigned May 20, 1999
Spring 1999		Due: June 4, 1999

1. Analyze the performance of list scheduling for $P|r_j, prec|L_{\max}$. You should be able to prove that it is a constant factor approximation algorithm.

2. Give an greedy algorithm that solves $1||\sum U_j$ in polynomial time.

3. Give an efficient algorithm to implement the shortest remaining processing time algorithm for $P|r_j|\sum C_j$.

4. Give a set of examples (parameterized by α) for $1|r_j|\sum C_j$ that show that the schedule formed by non-preemptively ordering the jobs by their α-completion-times can be as bad as a $1 + \frac{1}{\alpha}$ approximation algorithm, for any α between 0 and 1.

5. a) Write an integer program for the problem $1|prec|\sum w_j C_j$ using variables y_{it} where y_{it} is 1 if job 1 *starts* at time t.

b) Write an integer program for the problem $1|prec|\sum w_j C_j$ using variables δ_{ij} where $\delta_{ij} = 1$ if job i runs before job j and 0 otherwise.