

**MATH 354:03 LINEAR OPTIMIZATION, SPRING 2013
PROGRAMMING PROJECT
DUE ON 11:59PM 5/11/2012 BY EMAIL**

WARNING: Anything past the deadline won't be considered.

(1) Code a linear programming solver, which will be able to carry out the following

- Take a matrix $A \in \mathbb{R}^{m \times n}$ and vectors $b \in \mathbb{R}^m$, $c \in \mathbb{R}^n$ as inputs.
- Solves the problem $\max\{c^T x : Ax = b, x \geq 0\}$.
- Returns a flag indicating the condition of problem (optimum, infeasible, unbounded) such that:
 - if flag is optimum, then the optimum solution x^* along with its the objective value
 - if flag is infeasible, then empty set as the solution and $-\infty$ as the objective value
 - if flag is unbounded, then a feasible solution \bar{x} a direction \bar{d} such that $\bar{x} + \lambda\bar{d}$ is feasible for all $\lambda \geq 0$ (this direction is easily obtained from the simplex table).

NOTE: The programming languages available are MATLAB, C++ and Java. You can code your algorithm in any development environment. What I want is the source code (if C++, I want the .cpp file). Consider you will be provided 3 text files, one for each one of A , b , c (A.txt, b.txt, c.txt). Where b and c will be provided as column vectors. **Your code should be able to read these matrices from the text files.**