CS 322: Quiz 3

Friday, July 12, 2002

The rules for this quiz are as follows:

- **Write your name and student ID number in the upper-right hand corner of the quiz.**
- This quiz will last for 15 minutes.
- Show **ALL** work for partial/full credit. This includes any definitions, mathematics, figures, etc.
- The quiz is closed book and closed notes, and no calculators are allowed on the quiz.
- No collaboration of any kind is allowed on the quiz.

1. (10 points) One Matlab function to solve upper triangular systems is given below.

```
function x = UTriSol(U,b)
% x = UTriSol(U,b)
%
% Solves the nonsingular upper triangular system  Ux = b.
% where U is n-by-n, b is n-by-1, and x is n-by-1.

n = length(b);
x = zeros(n,1);
for j=n:-1:2
   x(j) = b(j)/U(j,j);
   b(1:j-1) = b(1:j-1) - x(j)*U(1:j-1,j);
end
x(1) = b(1)/U(1,1);
```

Using this code as a starting point, complete the following Matlab function so that it solves the multiple right-hand sides problem for upper triangular systems. Use the function prototype given below. Efficiency matters!

```
function X = UTriSolM(U,B)
% X = UTriSolM(U,B)
%
% U is an n-by-n nonsingular upper triangular matrix
% B is an n-by-r matrix.
%
% X satisfies  UX = B.
```