Householder QR factorization

```
function [U,R] = householder(A)


[m, n] = size(A);
R = A;


for k = 1:n,
  x = R(k:m,k);
  e = zeros(length(x),1); e(1) = 1;
  u = sign(x(1))*norm(x)*e + x;
  u = u./norm(u);

  R(k:m, k:n) = R(k:m, k:n) -2*u*u'*R(k:m, k:n);
  U(k:m,k) = u;
end
```