Assignment 8

```matlab
function Q = grams(A)

    [m, n] = size(A);
    Q = zeros(m, n);

    for j = 1:n
        v = A(:, j);

        % Subtract projections of v onto each of the previous vectors
        for i = 1:j-1
            % Project v onto the i-th column of Q
            v = v - (Q(:, i)' * A(:, j)) * Q(:, i);
        end

        % Normalize the resulting vector
        Q(:, j) = v / norm(v);
    end
end
```

```matlab
A = [1 -1 7 1; 0 6 -3 3; -7 -7 -7 4; -9 6 0 -1];
Q = grams(A);

% Verifying that Q is orthonormal
% Check that Q' * Q is approximately the identity matrix
I_approx = Q' * Q
```

```
I_approx = 4×4
    1.0000         0    0.0000    0.0000
         0    1.0000    0.0000    0.0000
    0.0000    0.0000    1.0000    0.0000
    0.0000    0.0000    0.0000    1.0000
```