Gram Schmidt Algorithm

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Loading and initializing variables

```
clear;
load('hw4problem4.mat')
[N, K] = size(A);
Q = zeros(N, K);
w = zeros(N, 1);
```

Algorithm

```
% initialize
Q(:, 1) = A(:, 1) / norm(A(:, 1));

% step
for i=2:K
    w = zeros(N, 1);
    sub = zeros(N, 1);
    for j=1:i-1
        sub = sub + Q(:, j)*dot(Q(:, j), A(:, i));
    end
    w = A(:, i) - sub;
    w = w / norm(w);
    Q(:, i) = w;
end
```

Results

```
rank([A Q])
max(max(abs(eye(50)-Q'*Q)))
```

```
ans =

    50


ans =

   4.4409e-16
```

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