

```

clear
rng('default')
load sherman5
b = rand(n,1);
beta = norm(b);
m = 200;

```

Arnoldi method

```

V(:,1) = b / beta;
for j = 1:m

    % Compute next vector
    w = A * V(:,j);

    % Orthogonalise (GS)
    % H(1:j, j) = V' * w;
    % w = w - V * H(1:j, j);

    % % Orthogonalise (MGS)
    for i = 1:j
        H(i,j) = dot(w, V(:,i));
        w = w - H(i,j) * V(:,i);
    end

    % Reorthogonalisation
    for i = 1:j
        c = dot(w, V(:,i));
        w = w - c*V(:,i);
        H(i,j) = H(i,j) + c;
    end

    % Normalise
    H(j+1, j) = norm(w);

    % Record the new vector in V
    V(:, j+1) = w / H(j+1, j);

end

```

Check orthogonality of V

```
norm(V'*V - eye(m+1))
```

```

ans =
1.3964e-15

```