```
function [r,s,root1,root2] = Bairstow(n,mat,r,s,err,m)
mat1 = zeros(n+1,1);
mat2 = zeros(n+1,1);
i=1;
rerr = 1;
serr = 1;
while(i<=m && (rerr>=err || serr>=err))
   mat1(n+1,1) = mat(n+1,1);
   mat1(n,1) = mat(n,1) + r*mat1(n+1,1);
   for j = n-2:-1:0
      mat1(j+1,1) = mat(j+1,1) + r*mat1(j+2,1) + s*mat1(j+3,1);
   end

   mat2(n+1,1) = mat1(n+1,1);
   mat2(n,1) = mat1(n,1) + r*mat2(n+1,1);
   for j = n-2:-1:1
      mat2(j+1,1) = mat1(j+1,1) + r*mat2(j+2,1) + s*mat2(j+3,1);
   end

   dr = (-mat2(4,1)*mat1(1,1) + mat2(3,1)*mat1(2,1))/(mat2(2,1)*mat2(4,1)-mat2(3,1)*mat2(3,1));
   ds = (mat2(3,1)*mat1(1,1) - mat2(2,1)*mat1(2,1))/(mat2(2,1)*mat2(4,1)-mat2(3,1)*mat2(3,1));
   rerr = abs(dr/(r+dr));
   re(i,1) = rerr;
   serr = abs(ds/(s+ds));
   se(i,1) = serr;
   r = r+dr;
   s = s+ds;

   i=i+1;
end

if i >= m
   disp('Maximum Iteration number attained.');
elseif rerr <= err && serr <= err
   disp('Convergence for maximum relative approximate error reached.');
else
   disp('Convergence criteria for function value reached.');
end

root1= (r + sqrt(r*r+4*s))/2;
root2= (r - sqrt(r*r+4*s))/2;

figure
plot(1:i-1,re);
grid on;
title('R-Error v/s iteration');
print -djpg BairstowRError.jpg
figure
plot(1:i-1,se); % error plot for s
grid on;
title('BairstowError v/s iteration');
print -djpg BairStowError.jpg
end
```