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