```
% Gauss-Newton method for non-linear least squares.
% (for fixed model y=1/(1+p1*exp(p2*x))
% Input: x=(x1,...,xm)'- x coordinations
%        y=(y1,...,ym)'- y coordinations
%        p0 - initial vector
% Output: non-linear least suares solution (p=(p1,p2)' and plotting
function[p]=NLleastS(x,y,p0)
m=length(x);
p=p0;
rp=zeros(m,1);
for j=1:10 % Iteration
% Computing Jacobian of r(p^k) and r(p^k)
    for k=1:m
        Jr(k,1)=exp(p(2)*x(k))/(1+p(1)*exp(p(2)*x(k)))^2;
        Jr(k,2)=(p(1)*x(k)*exp(p(2)*x(k)))/(1+p(1)*exp(p(2)*x(k)))^2;
        rp(k)=y(k)-1/(1+p(1)*exp(p(2)*x(k)));
    end
% next iteration
    s=(Jr'*Jr)\(Jr'*rp);
    p=p-s;
end
p'
% Plotting result with "log-space" result.
w=-0.5:0.05:4.5;
p1=10.0976; p2=-1.1561; %Result from linearization method
flog=1./(1+p1*exp(p2*w));
f=1./(1+p(1)*exp(p(2)*w));
plot(x,y,'ro',w,flog,w,f)
grid
legend('Data','log-space least squares','non-linear least squares')
```

```
x=0:1:4;
y=[0.1;0.2;0.5;0.8;0.9];
p0=[10;-1];
p=NLleastS(x,y,p0);
ans =
 12.479553208387811  -1.262045780845237
```