function [xr,ea,k] = Biseccion(Fx,xl,xu,iMax,es)

[f] = Evalua(Fx,xl) + Evalua(Fx,xu);

k=0;

ea=100;

xr=0;

xr\_ant=(xl+xu)/2;

while (k<=iMax)&&(ea>=es);

xr\_ant=xr;

xr=(xl+xu)/2;

k=k+1;

if xr ~= 0;

ea=abs(xr-xr\_ant);

end

r=Evalua(Fx,xl)\*Evalua(Fx,xr);

if r<0;

xu=xr;

else

if r>0;

xl=xr;

else

if r==0;

ea=0;

end

end

end

fprintf('\n');

fprintf('\t %8.5f',xr\_ant);

fprintf('\t %8.2f',Evalua(Fx,xr));

fprintf('\t\t\t');

fprintf('\t %8.5f',xr);

fprintf('\t %8.5f',ea);

end

end

function [xr Ea i]=newthon\_raph(Fx,Dx,x0,EPS,EPS1,iMax)

i=1;

while i<=iMax

xr=x0-Evalua(Fx,x0)/Evalua(Dx,x0);

Ea=abs(xr-x0);

if (Ea<EPS)

break

end

if (abs(Evalua(Fx,xr))<EPS1)

break

end

i=i+1;

fprintf('\n');

fprintf('\t %8.5f',x0);

fprintf('\t %8.2f',Evalua(Fx,x0));

fprintf('\t %8.2f',Evalua(Dx,x0));

fprintf('\t %8.5f',xr);

fprintf('\t %8.5f',Ea);

x0=xr;

end

fprintf('\n');

end

programa:

clear all

clc

disp('\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*')

disp('VOLUMEN')

disp('\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*')

global p T a b N k

p = 3.5e7;

T = 300;

a = 0.401;

b = 42.7e-6;

N = 1000;

k = 1.3806503e-23;

% definimos funcion

syms V;

func = '(p + a\*(N/V)^2)\*(V-N\*b)-k\*N\*T';

Fx = inline(func,'V','p','T','a','b','N','k');

deriv = diff(func,V);

Dx = inline(deriv,'V','p','T','a','b','N','k');

% valores rango

xl=input('Vol inferior : ');

xu=input('Vol superior : ');

es=input('Tolerancia : ');

imax=input('ingrese imax:');

fprintf('\n\t Vi \t\t F(Vi) \t\t F''(Vi) \t\t Vi+1 \t\t Ea');

fprintf('\n\t----\t\t-------\t\t---------\t\t------\t\t---');

Nro = 2;

[xr,ea,iter] = Biseccion (Fx,xl,xu,Nro,es);

Nro=imax;

[xr,ea,iter] = newthon\_raph (Fx,Dx,xr,es,es,Nro);

fprintf('\n');

fprintf('Volumen = %8.5f',xr);

fprintf('\n');

programa corrido:

