%parameters //VERIFIED PROGRAMME

J=0.01;

K=0.01;

L=0.5;

B=0.1;

R=1;

%system matrix

A=[-B/J K/J ;-K/L -R/L];

B=[0;1/L];

C=[1 0];

D=[0];

%controllability

QC=[B A\*B]

%to determine the rank of controllability

R1=rank(QC)

%obsrvability

Qo=[C' A'\* C']

%to determine the rank of observability

R2=rank(Qo)

Co=ctrb(A,B)

unco=length(A)-rank(Co)

Ob=obsv(A,C)

unob=length(A)-rank(Ob)

Qc=rank([B A\*B])

Qo=rank([C' A'\*C'])

'G';

G=ss(A,B,C,D);

figure(1)

step(G)

T=feedback(G,1)

figure(2)

step(T)

'EIGEN VALUES OF t ARE';

systemmatrix=ssdata(T)

eigenvalues=eig(T)

if(eigenvalues<0)

disp('System is stable')

else

disp('System is unstable')

end;

sys=ss(A,B,C,D)

figure(1)

step(sys)

stepinfo(sys)

hold on;

pol=pole(sys)

g=[-10+1i\*10 -10-1i\*10];

k=place(A,B,g);

Z=A-B\*k

syscl=ss(Z,B,C,D)

figure(3)

step(syscl)

hold on

