```
clear
clc

clear

m=[1,1]; %lbs^2/ft

E=29000; %ksi
I=3.86; %in^4
L=60; %in
k=[12*E*I/L^3,12*E*I/L^3]*12*1000; %lb/ft

n=length(m);
M=zeros(n);
for i=1:n
    M(i,i)=M(i,i)+m(i);
end
M

k=[k,0];
n=length(k);
K=zeros(n);
for i=1:n-1
    K(i,i)=K(i,i)+k(i)+k(i+1);
    K(i,i+1)=K(i,i+1)-k(i+1);
    K(i+1,i)=K(i+1,i)-k(i+1);
end
K(:,n)=[];
K(n,:)=[];
K

[phi omega]=eig(K,M);
phi'*M*phi;

for i=1:length(phi)
    phi(:,i)=phi(:,i)./max(abs(phi(:,i)));
end
phi

w=diag(sqrt(omega));

T=2*pi./w %s

Mn=diag(phi'*M*phi); %lbs^2/ft
Mn=Mn*32.2 %lbm

L=ones(length(M),1);

Ln=phi'*M*L; %lbs^2/ft
Ln=Ln*32.2 %lbm

G=Ln./Mn
```

```
M =
```

```
     1     0
     0     1


K =

   1.0e+05 *

    1.4925   -0.7463
   -0.7463    0.7463


phi =

   -0.6180   -1.0000
   -1.0000    0.6180


T =

    0.0372
    0.0142


Mn =

   44.4993
   44.4993


Ln =

  -52.1007
  -12.2993


G =

   -1.1708
   -0.2764
```

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