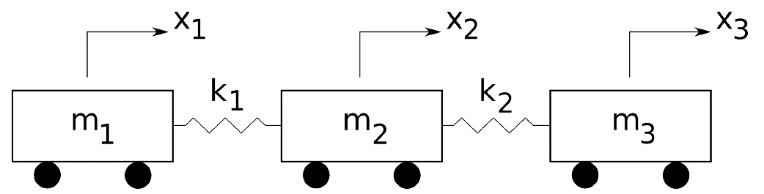
Diagram

Description automatically generated

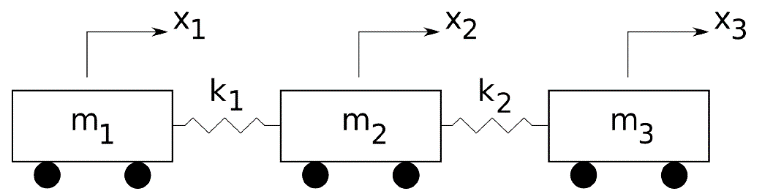
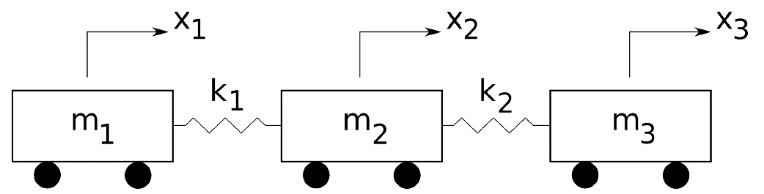
**Find the natural frequencies and normal modes of this mass-spring assembly.**

Assumptions: ,

Free Body Diagrams and F=ma:











For these differential equations, we assume →

System of equations: Matrix Equation:

→**,**

where:

Solving for the eigenvalues:

→

So, my eigenvalues are:

Now, calculate corresponding eigenvectors

For λ=0, ω1=0:

→ →

For λ=-3, ω2=(3k/m)0.5:

→ →

For λ=-1, ω3=(k/m)0.5:

→ →