

Coding task of Matlab 1: How to organize file and read/add proper comment.

Physical Background

One of the simplest problems in mechanics is the harmonic oscillator realized as a mass, m , on a spring with spring constant k moving in one dimension, x , in time t . The spring restoring force is a representation of the situation for small oscillations of any bound system, since it represents the first term in the Taylor expansion of the force binding the particle. The one-dimensional differential equation is:

$$\frac{d^2x}{dt^2} = -\frac{k}{m}x - \frac{b}{m}\frac{dx}{dt} + B\cos(\omega t)$$

where b is a damping factor and B is a harmonic driving term with driving frequency ω . The damped frequency in the absence of damping and driving terms is $\omega_0 = \sqrt{k/m}$ and the motion is oscillatory $x \sim e^{\pm i\omega_0 t}$.

This second order equation needs initial values for position and velocity to be defined in order for the solution to be fully determined.

Question

Now, I've provided a simple example of solver and visualization of Harmonic Oscillator. Read the provided code, play it, and try to reconstruct the file into project.

A project means you need several entrances like 'main.m', a folder including necessary functions and you should add comment to make it readable.

Finally, you should write a code on yourself to visualize the motion of two coupled harmonic oscillator, a possible but unorganized example is shown in 'Couple_pendula.m'. DONNOT JUST COPY THEM.