Programming Language: MatLab

1st Semester 2015

Chong-Wai

W06, 19th Oct

Homework, Oscillation

Consider a block with mass **M** connected with a spring with spring constant **k**

a) Try to simulate the motion of a block with equation of motion "Ma = -kx" with different initial conditions (x,v). Plot your results in the Phase Diagram ("x" as x-axis, "v" as y-axis), at least oscillate 3 cycles.

b) If there is an additional dissipation term ~ -βv (β: dissipation coefficient), then the equation of motion becomes as Ma = – βv – kx, consider the cases,

i) $\beta^2 < k/M$

ii) $\beta^2 = k/M$

iii) $\beta^2 > k/M$

c) Show your results in b) with different colors for case i) ~ iii) in the phase diagram. Try to compare and explain your results in the diagram.

d) Try to use the functions "getframe" and "movie" to construct an animation of your results in a) and b)

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Cation:

1) Please naming the file name of you home work as "HW04_G##_XXX_XXX.ppt", where ## and XXX are the group number and the last three digits of your student ID, respectively.
   (do not use any Chinese on the file name)

2) Please submit your homework on time (before 10/26 23:59)

3) Please specify your group, name and contribution in the first page

4) Please do not copy your HW from your classmate, but you can discuss