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Exercises 7

'''

Pendulun

$d_d\theta = -g/l \sin(\theta) + C \cos(\theta) \sin(\Omega t)$

'''

import numpy as np

from scipy.integrate import odeint

from math import *

import matplotlib.pyplot as plt

#from IPython.display import display, clear_output

#import time

def sys(theta, t, l, C, omega, g):

 theta1 = theta[0]

 theta2 = theta[1]

 dtheta1_dt = theta2

 dtheta2_dt = -g/l*sin(theta1)+ C*cos(theta2)*sin(omega*t)

 dtheta_dt = [dtheta1_dt,dtheta2_dt]

 return dtheta_dt

def main():

 C = 2

 l = 10/100 #m

 t = np.linspace(0,100,2500)

 g = 9.81

 theta_0=np.array([0,0]).T

 omega = np.sqrt(g/l)#5

 theta = odeint(sys,theta_0,t,args = (l,C,omega,g))

 plt.plot(t,theta)

 print(theta)

 plt.legend(['theta','thetadot'])

 plt.title("Pendulum change through time with force in natural pendulum's frequency")

 plt.xlabel("time")

 plt.show()

 fig, ax = plt.subplots(figsize=(4,4))

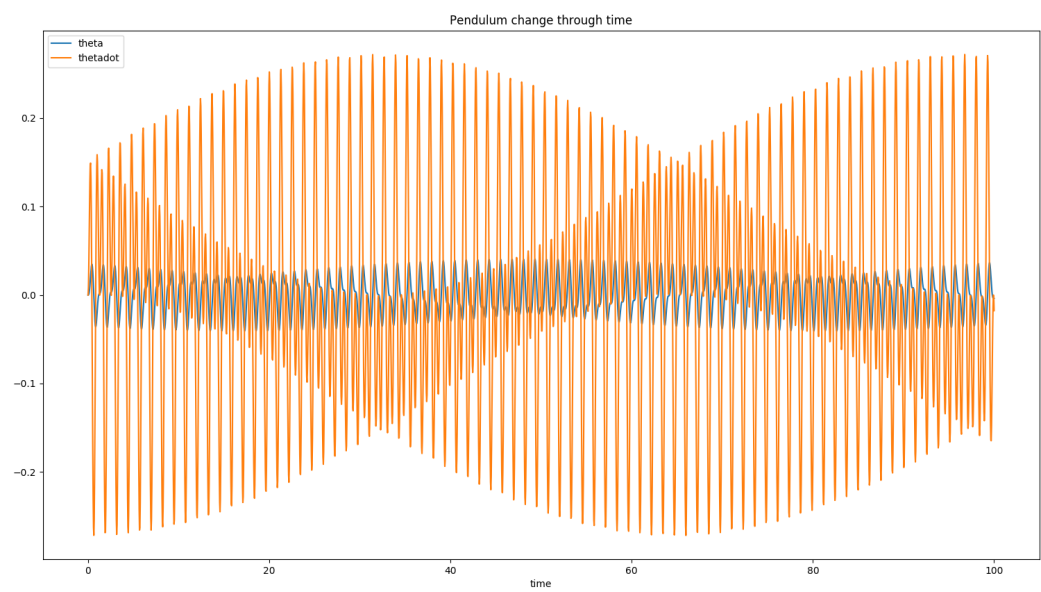
 x=theta

if __name__ == "__main__":

 main()

---- Output figures

(a)



(b)

