# -\*- coding: utf-8 -\*-

"""

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"""

print("Jezus wat was dit een gedoe een biertje zou fijn zijn ;-)")

import matplotlib.pyplot as plt

import numpy as np

t0 = 0

t1 = 20

dt = 0.001

t = np.linspace(t0,t1,int(1+(t1-t0)/dt))

g = 2

l = 0

r = 0.5

r1 = 0.25

m =1.6

"""

6.23

np.pi\*0.15\*\*2

1.4\*\*2

0.05

"""

Temp = 0.5-np.pi\*r1\*\*2

Temp1 = 1.6/Temp

Temp2 = 0.5\*Temp1

Temp3 = -np.pi\*r1\*\*2\*Temp1

Temp4 = 1/12\*Temp2+Temp3\*0.5\*r1\*\*2

Theta\_hoek0 = -np.pi/2

Xeno0 = 0

alpha\_hoek0 = 0

Theta\_hoek = np.zeros(len(t))

Theta\_hoekL = np.zeros(len(t))

Xeno = np.zeros(len(t))

XenoL = np.zeros(len(t))

alpha\_hoek = np.zeros(len(t))

alpha\_hoekl = np.zeros(len(t))

moment = np.zeros(len(t))

momentL = np.zeros(len(t))

Theta\_hoek[0] = Theta\_hoek0

Theta\_hoekL[0] = Theta\_hoek0

Xeno[0] = Xeno0

Zeros = []

ZerosL = []

Traagheidsmoments = Temp4

Traagheidsmoment = Traagheidsmoments+m\*r\*\*2

for n in range(len(t)-1):

moment[n] = -m\*g\*r\*np.sin(Theta\_hoek[n])

momentL[n] = -m\*g\*r\*(Theta\_hoekL[n])

alpha\_hoek[n] = moment[n]/Traagheidsmoment

alpha\_hoekl[n] = momentL[n]/Traagheidsmoment

Theta\_hoek[n+1] = Theta\_hoek[n]+Xeno[n]\*dt

Theta\_hoekL[n+1] = Theta\_hoekL[n]+XenoL[n]\*dt

Xeno[n+1] = Xeno[n]+alpha\_hoek[n]\*dt

XenoL[n+1] = XenoL[n]+alpha\_hoekl[n]\*dt

if Theta\_hoek[n]\*Theta\_hoek[n+1] <0:

Zeros.append(t[n])

if Theta\_hoekL[n]\*Theta\_hoekL[n+1] <0:

ZerosL.append(t[n])

tijd = Zeros[2]-Zeros[0]

tijdL = ZerosL[2]-ZerosL[0]

print("Python 5f")

print("I= ",np.round(Traagheidsmoments,3)," kg\*m^2")

print("T=",tijd,"s")

print("Tlin=",tijdL,"s")

plt.plot(t,Theta\_hoek,"r-")

plt.plot(t,Theta\_hoekL,"y--")

plt.show