pendulum_demo

January 16, 2020

[1]:
```
%matplotlib inline
```

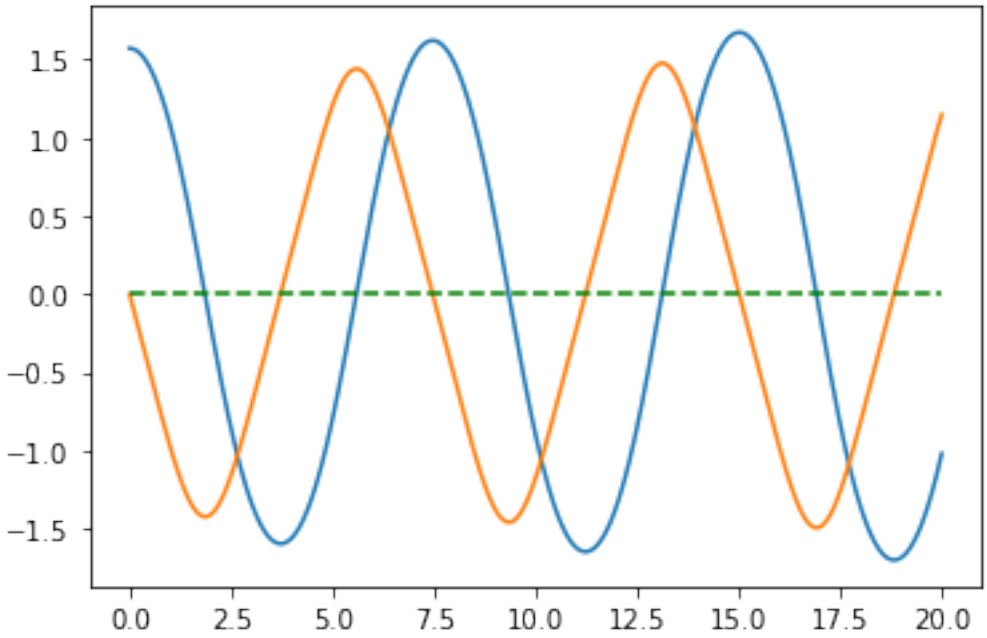
[23]:
```
import matplotlib.pyplot as plt
import math as m
```

[28]:
```
#simulation parameters

length=10
g=10
omega=m.sqrt(g/length)
ht=0.01
Nt=2000

#initial conditions
tstep=0
time=tstep*ht
theta=0.5*m.pi
nu=0.0
```

[29]:
```
#storage - fill with initial conditions
tarray=[time]
thetaarray=[theta]
nuarray=[nu]
```

[30]:
```
#main loop
while tstep<Nt:
    thetanew=theta+ht*nu
    nunew=nu-ht*omega*omega*m.sin(theta)
    tstep=tstep+1
    time=ht*tstep
    nu=nunew
    theta=thetanew

    tarray.append(time)
    thetaarray.append(theta)
    nuarray.append(nu)
```

[31]:
```
plt.plot(tarray,thetaarray)
plt.plot(tarray,nuarray)
plt.plot([0,Nt*ht],[0,0],'g--')
plt.show()
```



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