# Ex\_2 Level\_1 Problem\_#1 Exponential Growth and Decay

import matplotlib.pyplot as plt

from scipy.integrate import odeint

def model(y,time,r,K):

N=y[0]

dN=0

return [dN]

y=[1]

params=(0.05,10)

times=range(0,100)

out=odeint(func=model,y0=y,t=times,args=params)

plt.plot(out)

plt.show

dN = k (pitch +/-)

Write a program that can implement an ODE solution that exhibits Exponential Growth and Exponential Decay.

# Ex\_2 Level\_1 Problem\_#1 Exponential Growth and Decay

import matplotlib.pyplot as plt

from scipy.integrate import odeint

def model(y,time,r,K):

N=y[0]

dN=-2\*time

return [dN]

y=[1]

params=(0.05,10)

times=range(0,100)

out=odeint(func=model,y0=y,t=times,args=params)

plt.plot(out)

plt.show

Explore and report on how changing the parameters changes the behavior of the solution.

In the equation Y=Y0ekt:

* Y= dN = k (pitch +/-, and subsequently “y-range”)
* t = time
* times=range(0,100) gives you the time range

Try different time-step sizes.

Can you plot multiple parameters/solution on the same plot?