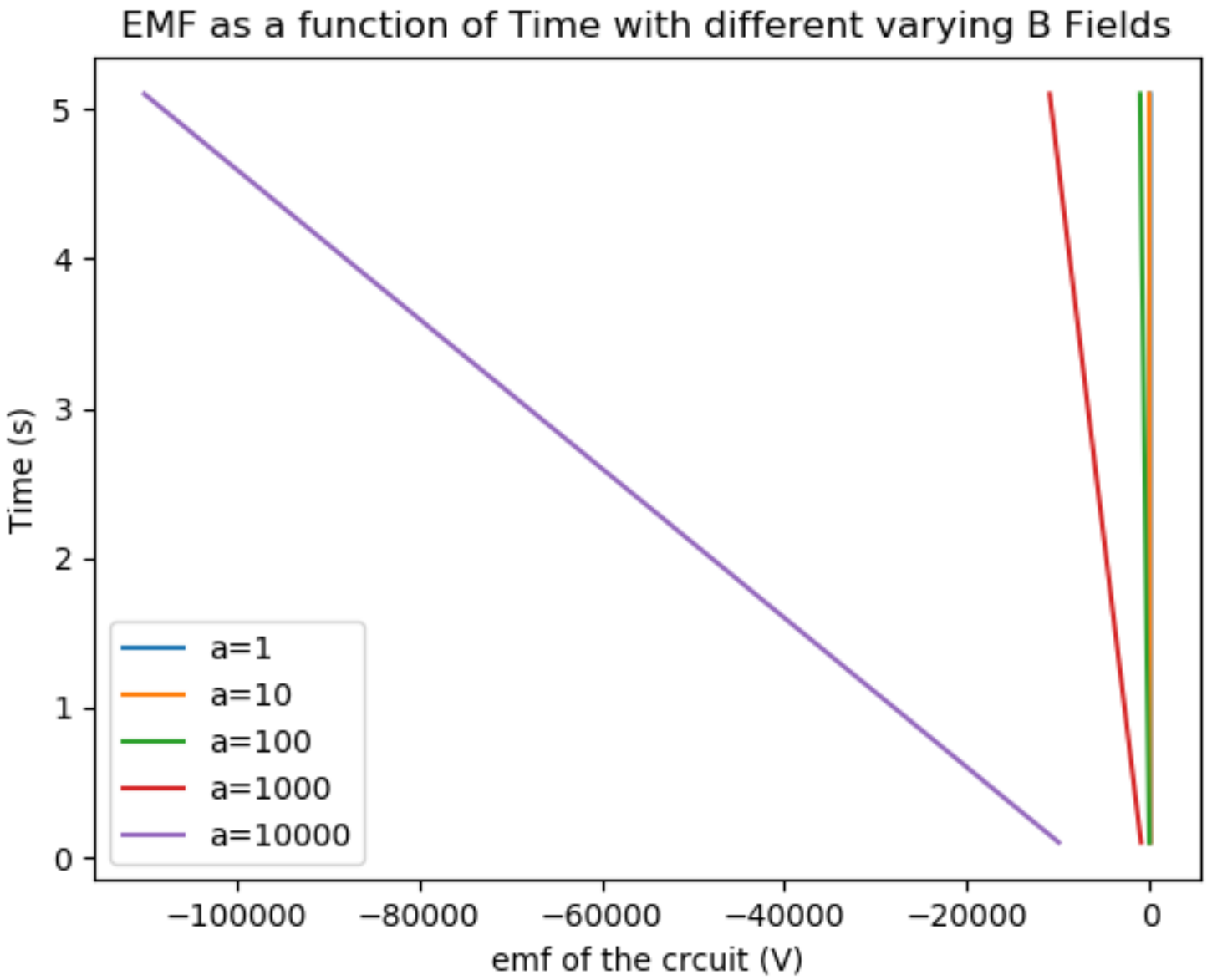
```
import matplotlib.pyplot as plt
from math import *

w = 1 #width of the loop
x_0 = 1 #initial part of loop in B field
v = 1 #constant velocity
#a = 1 #some constant in the B field
B_0 = 1 #b field

a = [1, 10, 100, 1000, 10000]

t = 0
dt = 0.1
tf= 5

time = []
EMF_1 = []
EMF_2 = []
EMF_3 = []
EMF_4 = []
EMF_5 = []

      t < tf:
        emf_1 = -(w*x_0*a[0])-(w*v*B_0)-(2*w*v*a[0]*t)
        emf_10 = -(w*x_0*a[1])-(w*v*B_0)-(2*w*v*a[1]*t)
        emf_100 = -(w*x_0*a[2])-(w*v*B_0)-(2*w*v*a[2]*t)
        emf_1000 = -(w*x_0*a[3])-(w*v*B_0)-(2*w*v*a[3]*t)
        emf_10000 = -(w*x_0*a[4])-(w*v*B_0)-(2*w*v*a[4]*t)


        t= t + dt
        time.append(t)
        EMF_1.append(emf_1)
        EMF_2.append(emf_10)
        EMF_3.append(emf_100)
        EMF_4.append(emf_1000)
        EMF_5.append(emf_10000)

plt.plot(EMF_1, time, label='a=1')
plt.plot(EMF_2, time, label='a=10')
plt.plot(EMF_3, time, label='a=100')
plt.plot(EMF_4, time, label='a=1000')
plt.plot(EMF_5, time, label='a=10000')
plt.xlabel('emf of the crcuit (V)')
plt.ylabel('Time (s)')
plt.title('EMF as a function of Time with different varying B Fields')
plt.legend()
plt.show()
```


EMF as a function of Time with different varying B Fields
Time (s)
emf of the crcuit (V)
0
1
2
3
4
5
−100000
−80000
−60000
−40000
−20000
0
a=1
a=10
a=100
a=1000
a=10000