import random

import matplotlib

import numpy as np

import time

import math

from pylab import \*

import msvcrt as m

def LIF (i, oldv, tau, thresh):

sum=(1-exp(-1/tau))\*i+exp(-1/tau)\*oldv

if np.all(sum >= thresh):

return ([0,1])

else:

return ([sum, 0])

#runs IF neurons for a given input and threshold

def RUN\_LIF (y, tau, thresh):

n=len(y)

x=zeros(n)

v=zeros(n)

i=1

while i<n:

[v[i],x[i]]=LIF(y[i],v[i-1],tau, thresh)

i=i+1

return([v,x])

def SINU (n, f):

t=linspace(0,n)

y=1.0+sin(2\*pi\*t\*f)

return (y)

def W (w1, w2):

i=0

w=np.zeros([25,25])

while i<25:

j=0

while j<25:

if random()<0.5:

w[i,j]=w1\*random()

else:

w[i,j]=w2\*random()

if i==j:

w[i,j]=0.0

j+=1

i+=1

return (w)

def IN (y,x, weights):

i=weights.dot(x)

i=i+y

return(i)

def RUN (y,weights, tau, thresh):

n=len(y)

print(n)

v=np.zeros([n,25])

x=np.zeros([n,25])

i=np.zeros([n,25])

t=np.zeros(25)

t[:]=thresh

step=1

while step<n:

i[step,:]=IN(y[step],x[step-1,:],weights)

[v[step,:],x[step,:]]=LIF(i[step,:],v[step-1,:],tau,t[:])

step+=1

figv=plt.figure()

u=0

while u<25:

plot(2\*u+v[:,u])

u=u+1

figx=plt.figure()

u=0

while u<25:

plot(2\*u+x[:,u])

u=u+1

figphase=plt.figure()

plot(v[:,10],v[:,22])

return(v,x)