import numpy as np

import matplotlib.pyplot as plt

import scipy.linalg as la

import scipy.signal as signal

trading\_volume=100+30\*np.random.randint(0,5,126)

noise=np.random.normal(0,1,126)

noisy\_volume=trading\_volume+noise

window\_size=7

b=np.ones(window\_size)/window\_size

smoothed\_vol=signal.filtfilt(b,1,noisy\_volume)

weekly\_vol=smoothed\_vol.reshape(-1,7)

weekly\_total=[]

for week in weekly\_vol:

s=np.sum(week)

weekly\_total.append(s)

print("Weekly\_sums")

print(weekly\_total)

plt.plot(noisy\_volume,color='r',label='noisy\_volume')

plt.plot(smoothed\_vol,color='b',label='smoothed\_vol')

plt.plot(weekly\_total,color='g',label='weekly\_total')

plt.xlabel("Days")

plt.legend()

plt.show()

exceeded\_volume=smoothed\_vol>150

exceeded\_intervals=[]

start=-1

for i in range (0,len(exceeded\_volume)):

if start==-1 and exceeded\_volume[i]:

start=i

else:

if start!=-1 and i-start>3:

exceeded\_intervals.append((start,i))

start=-1

for start,end in exceeded\_intervals:

plt.axvspan(start,end,alpha=0.3)

plt.plot(smoothed\_vol,color='g',label='smoothe\_vol')

plt.axhline(y=150,color='r')

plt.ylabel("trading volume")

plt.xlabel("Days")

plt.show()

Weekly\_sums

[1315.8593014712073, 1008.093839740925, 1053.7940580470884, 1018.7480989177154, 922.0196714312912, 982.4364739107695, 1080.4058114680104, 1181.9518351890524, 1103.9303050531316, 1138.6105295970995, 1091.7780816793354, 1091.0160725263424, 962.2991744751135, 1038.6785250591936, 1195.5470058826272, 1139.798900093033, 1186.6833669823475, 1258.7104983833551]



