﻿import numpy as np

import scipy as sp

import matplotlib.pyplot as plt

from collections import Counter

day\_20, close\_20 = sp.loadtxt('FTSE\_2020.csv',skiprows=1,delimiter=',',unpack= True)

diff\_20 = []

for i in range (0,(len(day\_20)-1)):

diff\_20.append((close\_20[i+1] - close\_20[i])\*100/close\_20[i])

i=i+1

diff\_20.sort()

diff\_20\_rounded = [round(num) for num in diff\_20]

count = Counter(diff\_20\_rounded)

dtype = dict(names = ['id','data'], formats=['i8','i8'])

array = np.fromiter(iter(count.items()), dtype=dtype)

final\_20 = np.array(list(count.items()))

percent, freq = np.hsplit(final\_20,2)

percent = percent.astype(int)

plt.plot(percent,freq)

mean = sum(percent\*freq)/sum(freq)

sigma = np.sqrt(sum((percent - mean)\*\*2)/sum(freq))

amp = np.amax(freq)

x=np.linspace(-15,15,1000)

y = amp\*np.exp(-(x-mean)\*\*2/(2\*sigma\*\*2))

plt.plot(x,y)

plt.show()