22103028

VISHAL

B1

import numpy as np

import matplotlib.pyplot as plt

from scipy import signal

heart\_rate\_data = np.random.normal(70, 150, 1440)

def smooth\_heart\_rate(data, cutoff=0.05, order=3):

b, a = signal.butter(order, cutoff)

return signal.filtfilt(b, a, data)

smoothed\_data = smooth\_heart\_rate(heart\_rate\_data)

def hourly\_averages(data):

hourly\_averages = np.mean(data.reshape(24, 60))

return hourly\_averages

hourly\_averages = hourly\_averages(smoothed\_data)

plt.plot(heart\_rate\_data, label='Noisy Heart Rate Data', color='grey')

plt.plot(smoothed\_data, label='Smoothed Heart Rate Data', color='blue', linewidth=2)

plt.show()