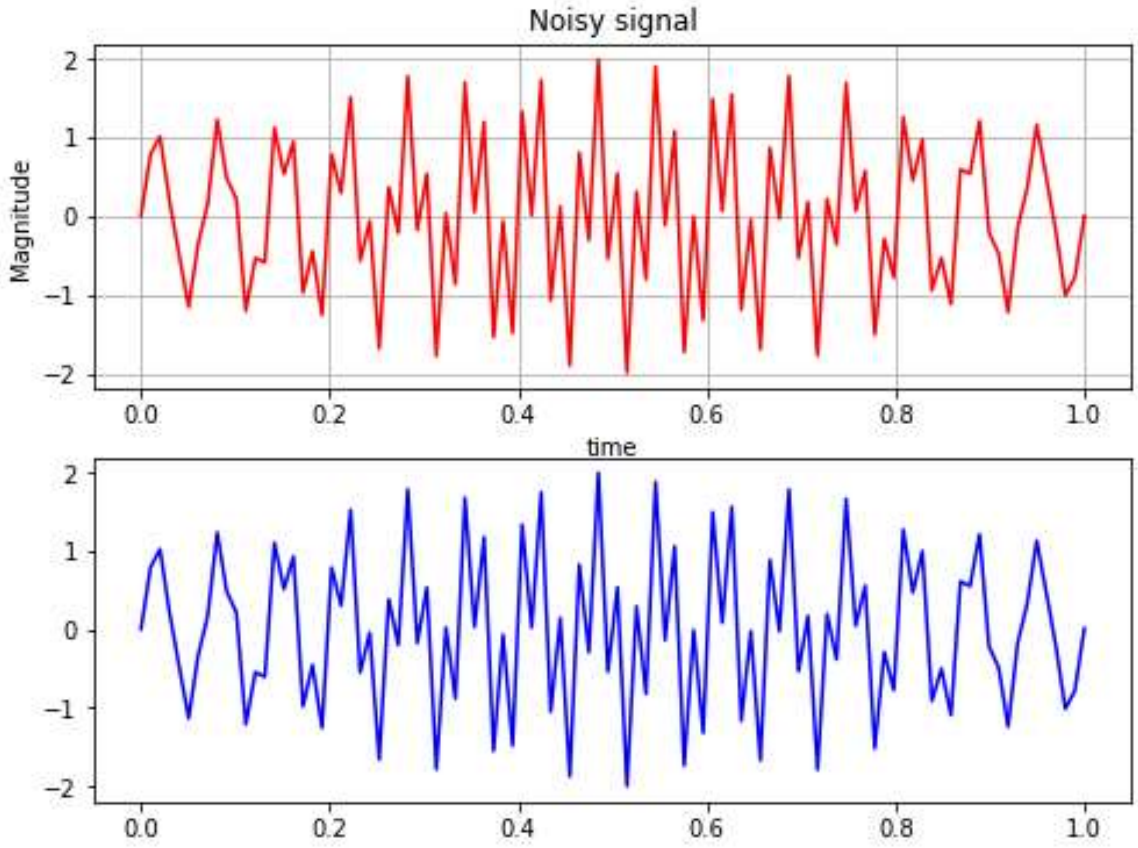
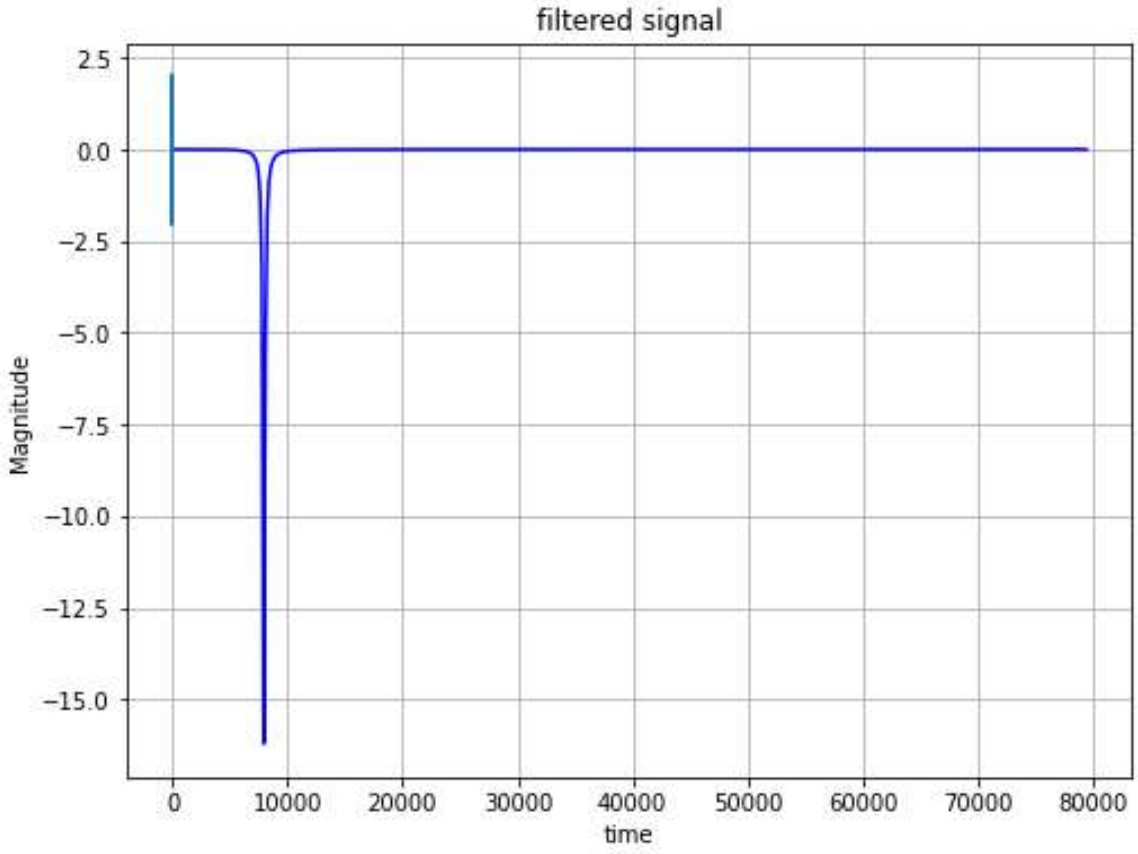
CODE:-

```
import numpy as np
from matplotlib import pyplot as plt
from scipy import signal,misc
f1=15
f2=50
n=np.linspace(0,1,100)
noisysignal=np.sin(2*np.pi*15*n)+np.sin(2*np.pi*50*n)
np.random.normal(0,0.1,1000)*0.03
fig=plt.figure(figsize=(8,6))
samp_freq=1000
notch_freq=50
quality_factor=20
b_notch,a_notch=signal.iirnotch(notch_freq,quality_factor,samp_freq)
plt.subplot(2,1,1)
plt.plot(n,noisysignal,color='r')
plt.grid(which='both',axis='both')
plt.xlabel('time')
plt.ylabel('Magnitude')
plt.title('Noisy signal')

outputsignal=signal.filtfilt(b_notch,a_notch,noisysignal)
plt.subplot(2,1,2)
```

```
plt.plot(n,outputsignal,color='blue')


samp_freq=1000
notch_freq=50
quality_factor=20
b_notch,a_notch=signal.iirnotch(notch_freq,quality_factor,samp_freq)
freq,h=signal.freqz(b_notch,a_notch,fs=samp_freq)
fig=plt.figure(figsize=(8,6))
plt.plot(freq*samp_freq/(2*np.pi),20*np.log10(abs(h)),'blue',label='bandpass filter')
plt.xlabel('freqency[Hz]')
plt.ylabel('Magnitude(dB)')
plt.title('Notch filter')
plt.grid()


plt.plot(n,outputsignal)
plt.xlabel('time')
plt.ylabel('Magnitude')
plt.title('filtered signal')
plt.show()
```

OUTPUT:-


Noisy signal
Magnitude
time
2
1
0
−1
−2
0.0
0.2
0.4
0.6
0.8
1.0


filtered signal
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−12.5
−15.0
Magnitude
0
10000
20000
30000
40000
50000
60000
70000
80000
time