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ABSTRACT:

Noise is an unwanted signal which interferes with the original message signal and corrupts the parameters of the message signal. This alteration in the communication process, leads to the message getting altered. It is most likely to be entered at the channel or the receiver, removal of this noise is very much important to get the original signal at the receiver.

INTRODUCTION:

In this project we will see that how can we remove the noise from a sinusoidal signal using MATLAB software to get the original signal as it is at the input. In this program we used the commands like fft and ifft (fast fourier transform and inverse fast fourier transform).Here we are removing an additive white gaussian noise from a cosine signal.

REQUIREMENTS:

PC/Desktop with MATLAB Software

PROCEDURE

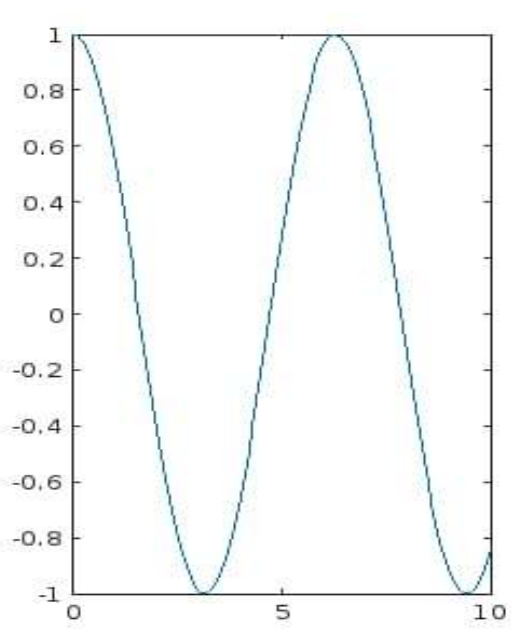
- Open MATLAB
- Open New M-File
- Type the program
- Save in Current directory
- Run the program
- For the output see the command window or figure window

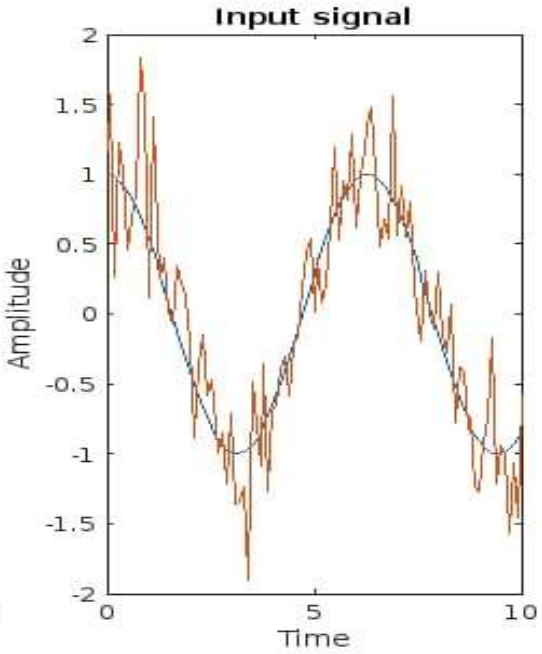
PROGRAM

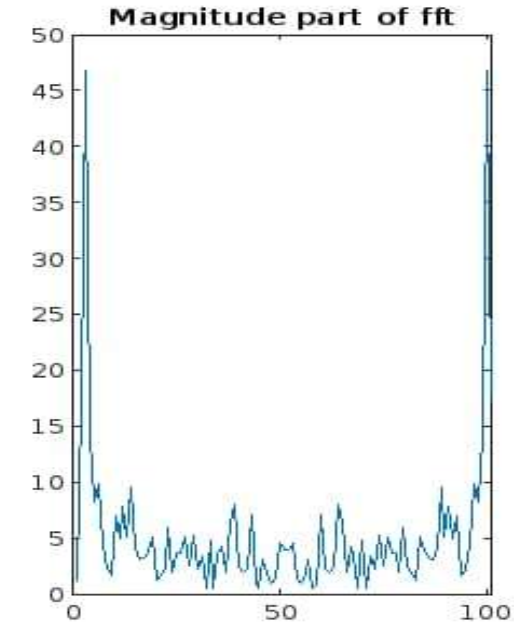
```
clc;
clear all;
close all;
t=0:0.01:10;
x=cos(t);
```

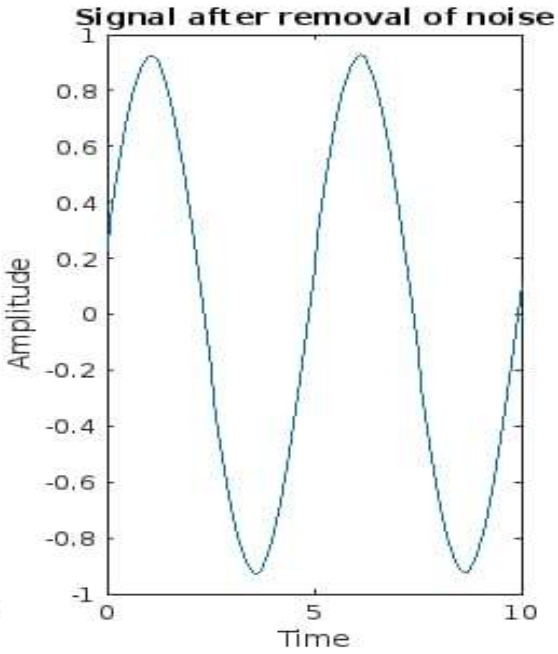
```
%generating a cosine signal
subplot(221);
plot(t,x);
xlabel('Time');
ylabel('Amplitude');
title(‘Original Signal’);
y=awgn(x,10);
%adding AWGN to the original signal
subplot(222);
plot(t,y);
title('Signal after adding AWGN');
xlabel('Time');
ylabel('Amplitude');
g=fft(y);
%performing fast fourier transform
subplot(223);
plot(abs(g));
title('Magnitude part of fft');
f=find(abs(g)<30);
g(f)=zeros(size(f));
w=ifft(g);
%performing inverse fast fourier transform
subplot(224);
plot(t,w);
title ('Signal after removal of noise');
xlabel('Time');
ylabel('Amplitude')
```

OUTPUT:


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
5
10


Input signal
Amplitude
Time
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
5
10


Magnitude part of fft
50
45
40
35
30
25
20
15
10
5
0
0
50
100


Signal after removal of noise
Amplitude
Time
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
5
10

CONCLUSION:

The noise from the signal is removed and the original signal is recovered but with some delay and with decreased amplitude.

RESULT:

A sinusoidal signal is passed through additive gaussian white noise and it is removed using fft and ifft using MATLAB.