Lab Report No 4

Demonstration of Concepts	**Poor (Does not meet expectation (1))** The student failed to demonstrate a clear understanding of the assignment concepts	**Fair (Meet Expectation (2-3))** The student demonstrated a clear understanding of some of the assignment concepts	**Good (Exceeds Expectation (4-5)** The student demonstrated a clear understanding of the assignment concepts	**Score** **30%**

Communication Systems

Submitted By:

Registration No:

Section:

"On my honor , as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work"

Student Signature:

Department of Computer Systems Engineering

University of Engineering and Technology Peshawar

CSE 402L: Digital Signal Processing

Accuracy	The student completed (<50%) tasks and provided MATLAB code and/or Simulink models with errors. Outputs shown are not correct in form of graphs (no labels) and/or tables along with incorrect analysis or remarks.	The student completed partial tasks (50% - <90%) with accurate MATLAB code and/or Simulink models. Correct outputs are shown in form of graphs (without labels) and/or tables along with correct analysis or remarks.	The student completed all required tasks (90%-100%) with accurate MATLAB code and/or Simulink models. Correct outputs are shown in form of labeled graphs and/or tables along with correct analysis or remarks.	**30%**
Following Directions	The student clearly failed to follow the verbal and written instructions to successfully complete the lab	The student failed to follow the some of the verbal and written instructions to successfully complete all requirements of the lab	The student followed the verbal and written instructions to successfully complete requirements of the lab	**20%**
Time Utilization	The student failed to complete even part of the lab in the allotted amount of time	The student failed to complete the entire lab in the allotted amount of time	The student completed the lab in its entirety in the allotted amount of time	**20%**

Lab No: 4.

Title: Signal Analysis in both time and frequency domain using Matlab

Provide .m file with detailed comments

Procedure:

1. Will generate the signal of different frequencies say , 10,20,30,40,50,60 Hz (one second duration) using Matlab as shown in figure 1 and transform the same signal in frequency domain using Fourier transform and will compare the frequencies with the time domain signal as shown in figure 2.

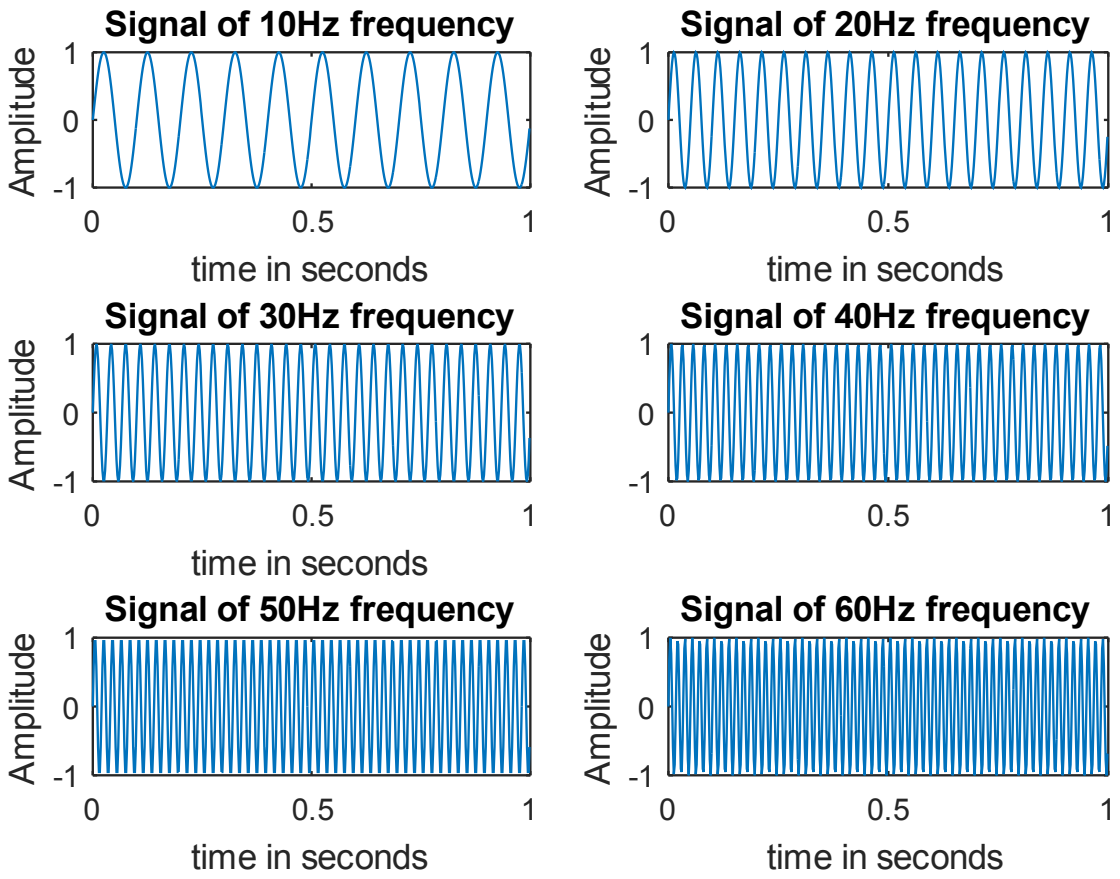

Figure 1: *Time Domain Representation*

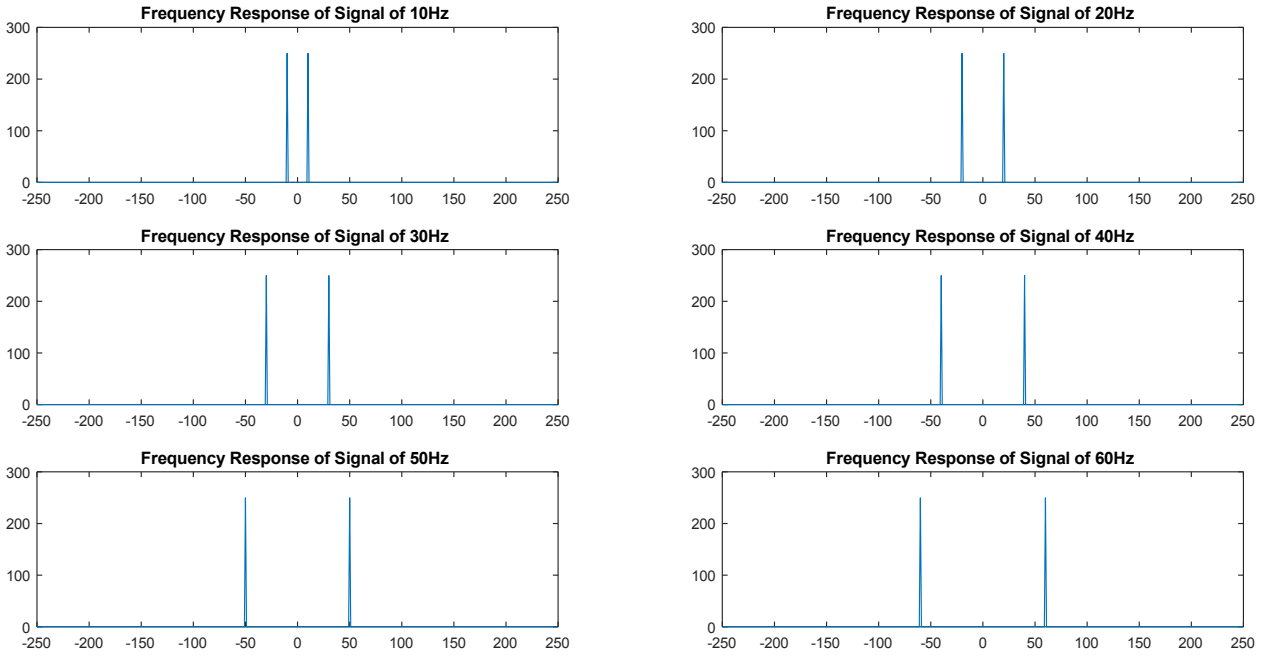

Figure 2: *Frequency Domain Representation*

2. **Compare** the figure 1 and 2 (Generated by your code)
3. Add all the signals generated in step 1 and get a composite signal. (which may be considered as a voice signal)
4. Obtain and plot the time and frequency domain representation of the composite signal as shown in figure 3

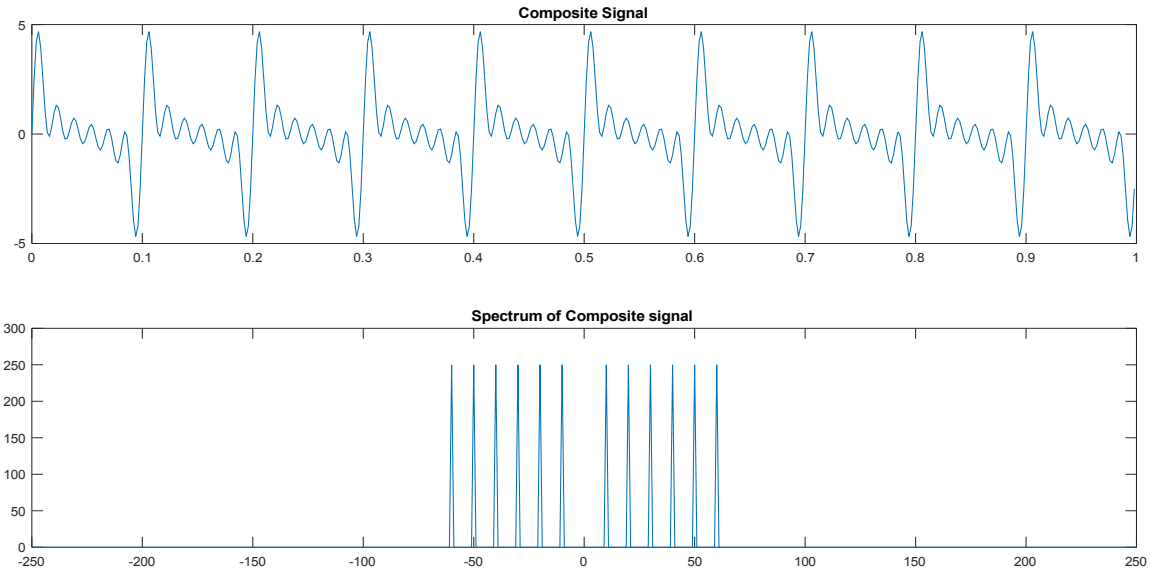

Figure 3: *Composite Signal in time and frequency domain*

5. **Compare/Confirm** that you are getting all the frequency generated in step 1 above.
6. Generate some unwanted signal having frequencies say 80Hz and 100Hz (assume these signal represent noise) and different amplitudes say 0.5 and 0.7
7. Obtain both time and frequency representation of noise and confirm they have different power as shown in figure 4

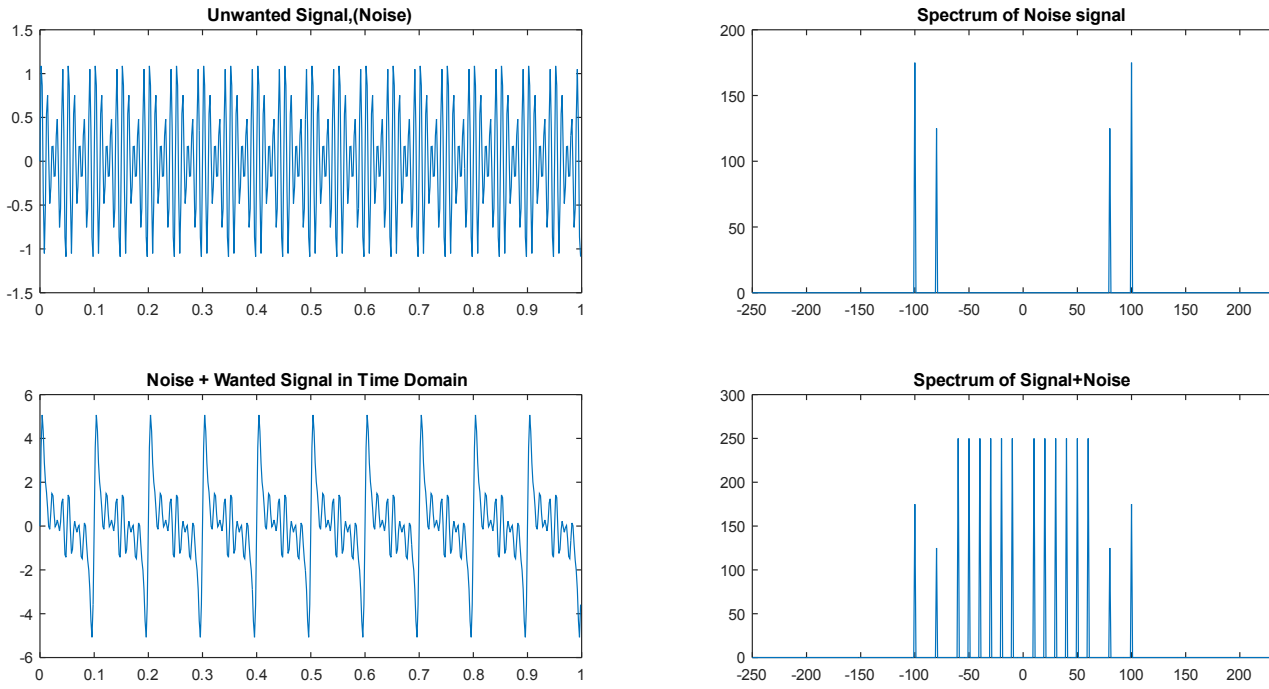

Figure 4: *Time and Frequency domain representation of Noise and Signal+Noise*

8. Add the noise to the composite signal (assume the noise is added to the signal during transmission) and obtain frequency spectrum.
9. Final Remarks/Conclusion.

Hints:

```
f1 = 10;

t = 0:0.001:1;

y1 = sin(2*pi*f*t);

plot(t,y1)
```

```
xlabel(“time in seconds”)

ylabel(“Amplitude”)

title(“Signal of 10 Hz frequency”)


Y1 =fft(y,length(y1))

n = length(Y1);

fshift(-n/2:n/2-1)*(1000*n);

Y1shift = (fftshift(Y1));

Figure

Plot(fshift,abs(Y1shift))
```