Project 1

Digital Signal Processing Report

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Answers to Questions

- **All questions must be answered consecutively *HERE!!***
- **Do not mix questions with plots and figures.**
- **As illustrated below, number the questions correctly, and copy and paste the question directly from the website immediately after each question number, Q1, Q2, etc. Then, provide your solution/answer below the copied question.**

Q1. Explain the result displayed on the interface (minimum and maximum vertical axis values) in terms of the source code attached to the F1 button.
The observed minimum value corresponds to 5 + 2(5 + 0.77) where 0.77 is the original maximum before pressing the button twice:
Max = 5 + 2(5+0.77) = 16.54
Min = 5 + 2(5 -0.77) = 13.46

Q2. Hand in the java code for "divide(float x)."

```
public void plus(Myclass x)
{
        for (int xx = 0; xx < n; xx++)
                {
                (this.data)[xx]  =  (byte)((this.data)[xx] + (x.data)[xx]);
                (this.re)[xx]  =  (this.re)[xx] + (x.re)[xx];
                (this.im)[xx]  =  (this.im)[xx] + (x.im)[xx];

                }
}
```

Q3. What is the theoretical value of H(ω) ?

$$H(\omega) = \frac{\omega^2}{1+\omega} = \frac{100}{11}$$

Q4. Explain the results, particularly what happened to the noise when comparing P10 with P11?

The noise floor in P11 is lower because of the highpass filtering operation.

Q5. And so forth …..

PLOTS and FIGURES

- **All plots and figures must be answered consecutively *HERE!!***
- **Do not mix questions with plots and figures.**
- **As illustrated below, number the figures correctly (Fig. P1 for plot P1, etc.).**
- **Make sure that your caption describes what is being plotted!!!!**
- **Make sure the graphics are clear and legible!!**
- **These should be no extraneous text, all text must be in captions**
- **Then, provide your comments at the end of the initial description in the caption as needed.**

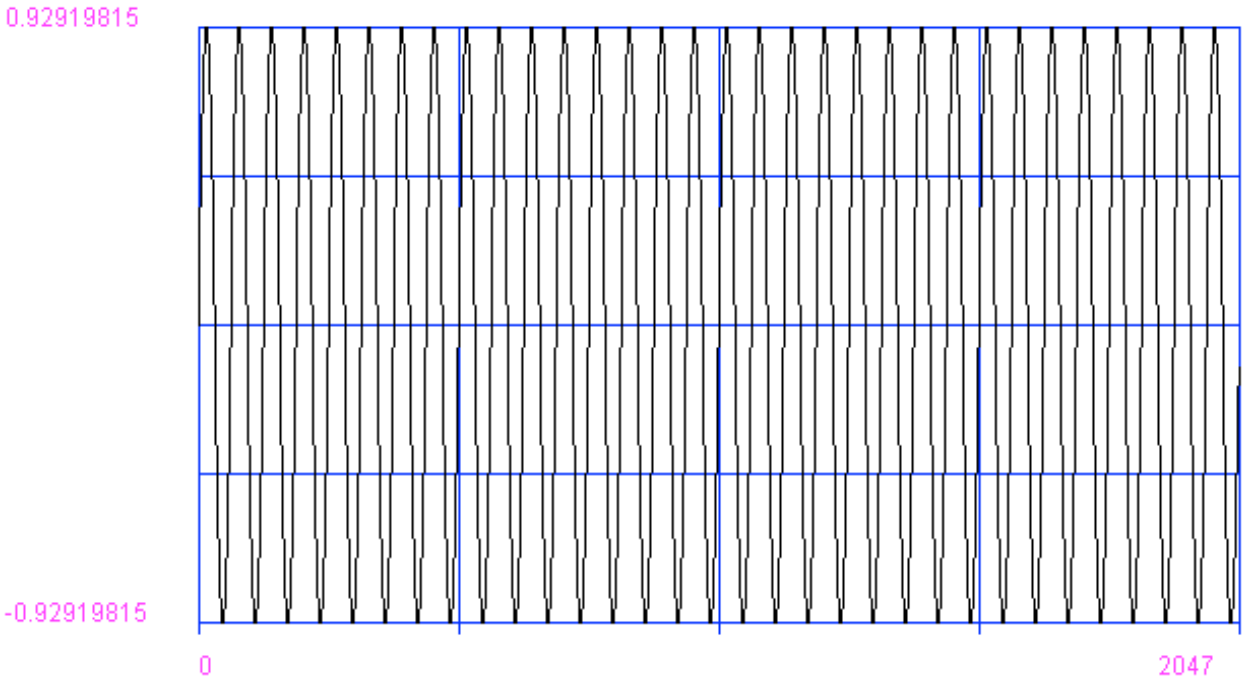

Fig. P1. Plot P1 showing sin32.au file, the input to the system.
The signal is a 1.86 volt 32 MHz sine wave.

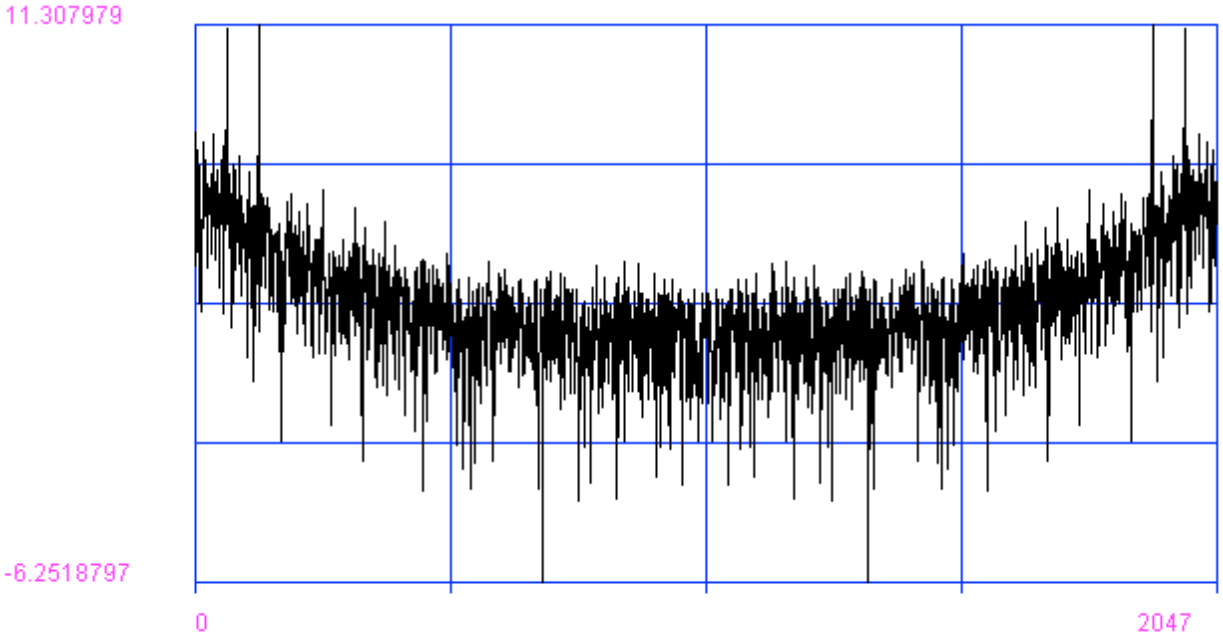

Fig. P2. Plot P2 showing 20 log10 |FFT| of ran88.au file.
Note: we were unable to remove the noise in this spectrum with our nonlinear filter, $y=x^2$.

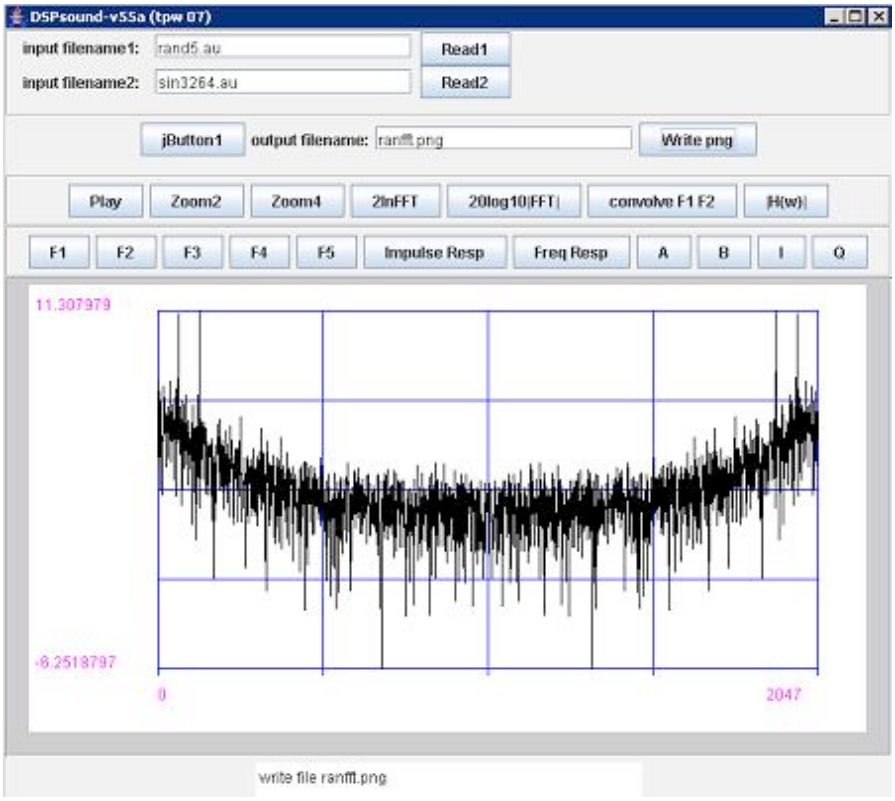

Fig. P3. Plot P3 showing UI.