

Signal Processing and Simulation Level I

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Product Highlights

Topics Introduction 1. Signals 2. Noise 3. Averaging 4. Fourier Theorem 5. FFT 6. Analog to Digital 7. Signal Denergy 8. Total Harmonic Distortion 9. Signal Operation 10. Modulation 11. Aliasing 12. Leakage 13. Windowing 14. Sidelobes 15. Zero Padding 16. Beating 17. Correlation 18. Summary Forther Theorem 18. Summary		ЕдиQuest signal Processing Level i	
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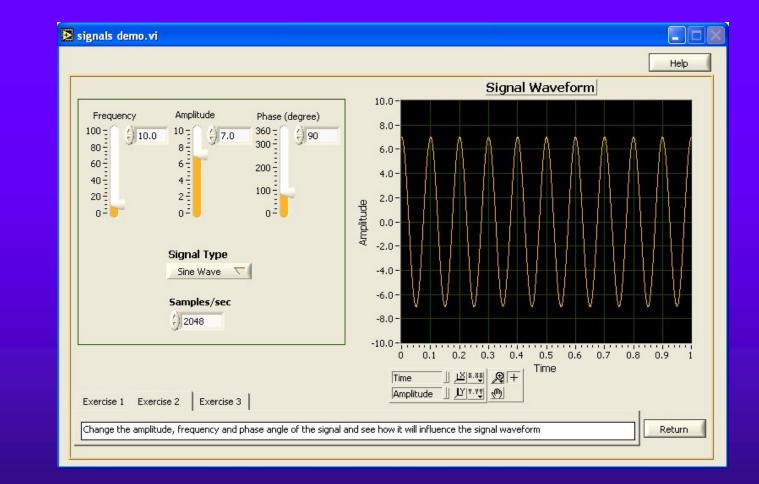
Features

1. 17 most common topics you will encounter in the real world.

2. Theory plus simulation will give you a much better understanding.

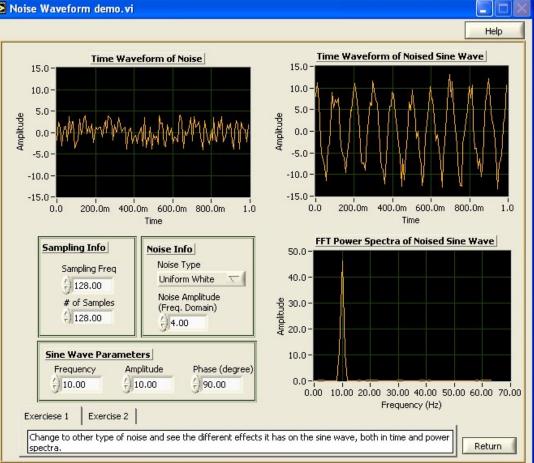
3. Exercises after each topic will let you know you really learned.

Signal Simulation



- 1. Concept of signals.
- 2. Classification of signals.
- 3. Signal generation.

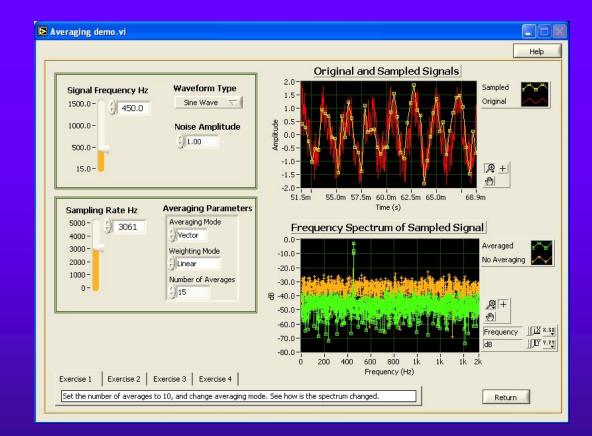
Noise Simulation



Noise Waveform demo.vi

- What you will learn?
 - 1.Where noise comes from?
 - 2. Noise Classification

Averaging Simulation

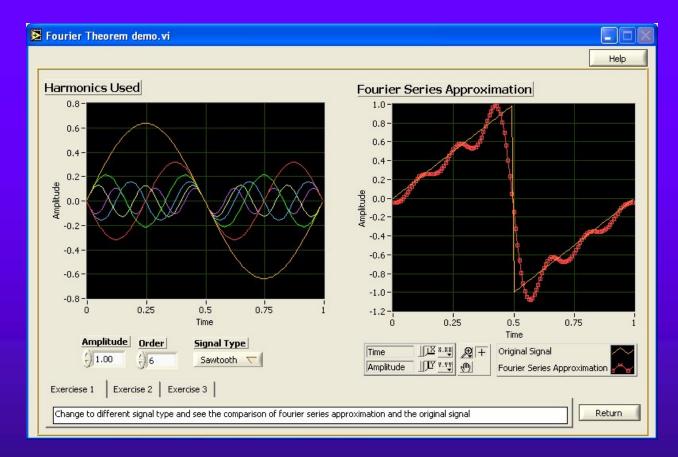


• What you will learn?

1. Averaging is a useful tool to reduce noise level.

2. Commonly used averaging method.

Fourier Theorem Simulation

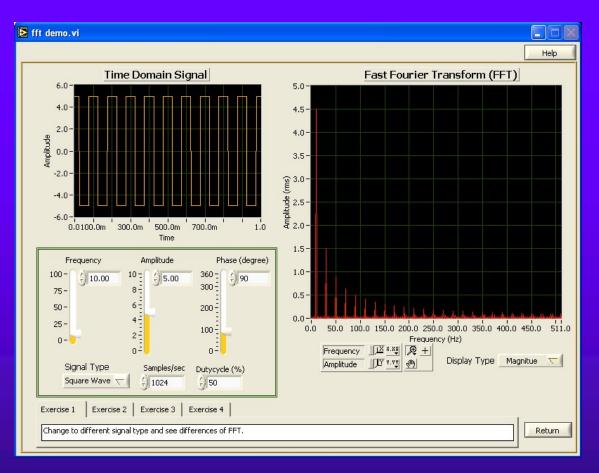


• What you will learn?

1. Importance of Fourier Theorem.

2. Any periodic signal can be expressed as a superposition of sinusoidal components.

Fast Fourier Transform Simulation



• What you will learn?

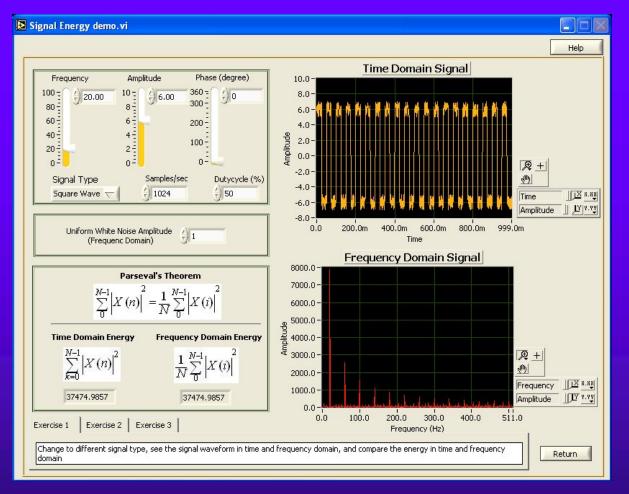
1. Efficient Discrete Fourier Transform calculation algorithm--Fast Fourier Transform

- 2. Several important issues of using FFT
- 3. The concepts of magnitude and phase information of a signal

Analog to Digital Conversion

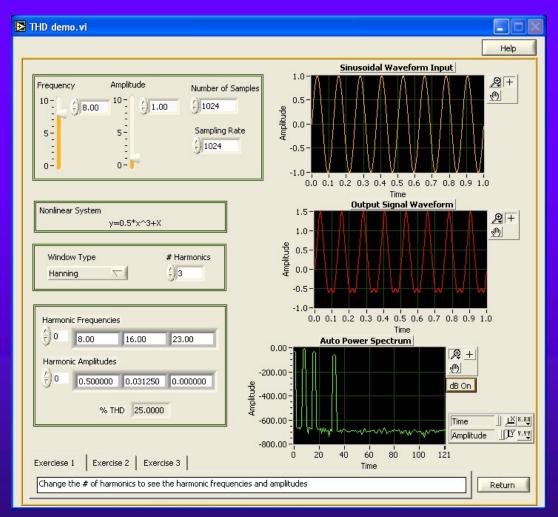
- 1. Concepts of quantization and quantization level.
- 2. Difference of discrete signal and digital signal.
- 3. Effect of quantization.
- 4. Average power of quantization error.

Signal Energy



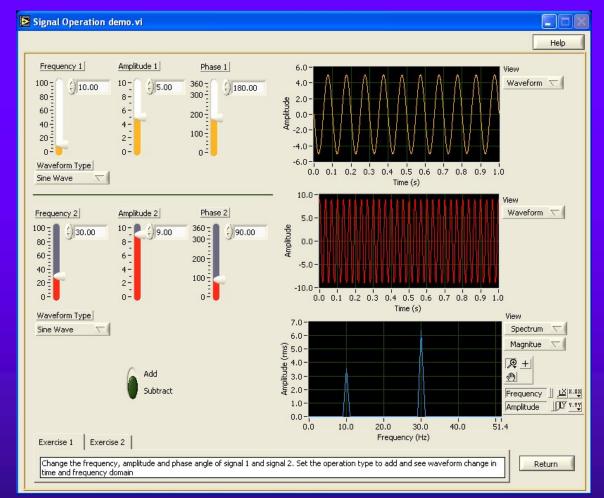
- What you will learn?
 - 1. Concept of signal energy in time and frequency domain.
 - 2. Parseval's Theorem.

Total Harmonic Distortion



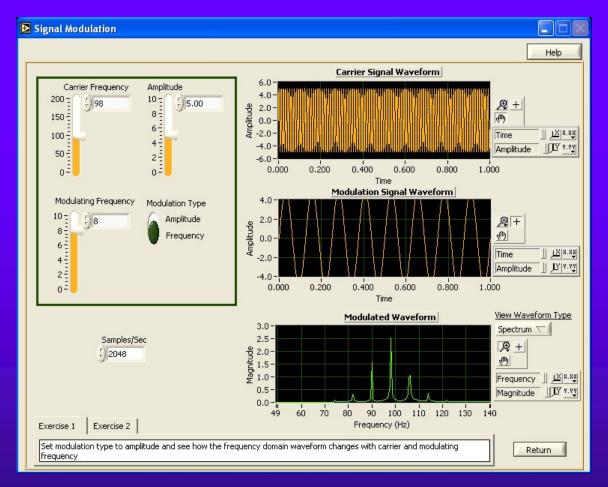
- 1. Concept of Total Harmonic Distortion.
- 2. Measurement of distortion

Signal Operation



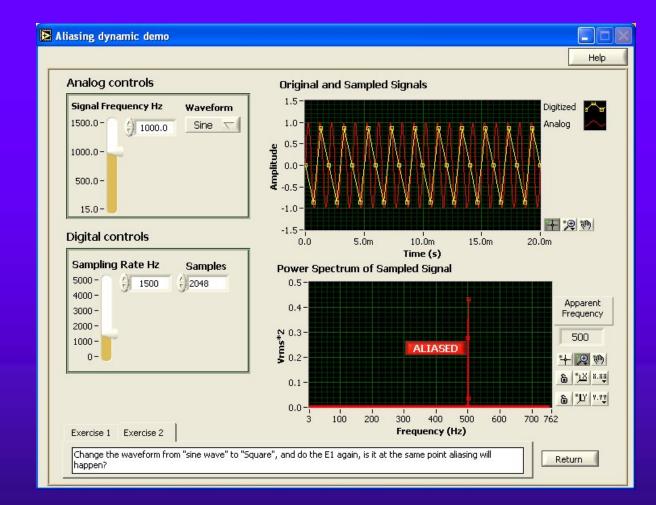
- 1. Common used signal operation method, scaling, delay and addition.
- 2. Concepts of Filtering.
- 3. Concepts of Modulation and Demodulation.

Signal Modulation Simulation



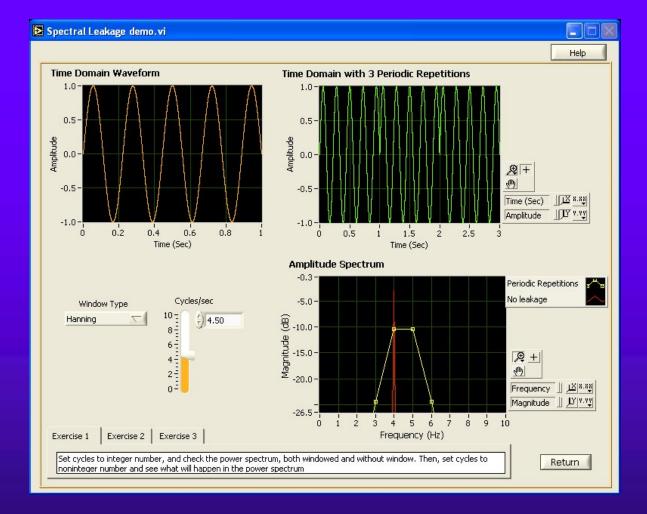
- 1. Concept of Modulation.
- 2. Classification of Modulation.
- 3. Detailed explanation of Amplitude Modulation and Frequency Modulation.

Aliasing Simulation



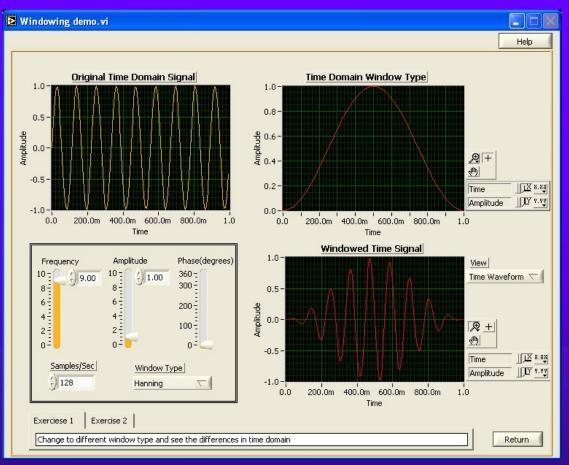
- 1. Nyquist Sampling Theory.
- 2. When Aliasing will happen?
- 3. How to select sampling frequency correctly?

Leakage Simulation



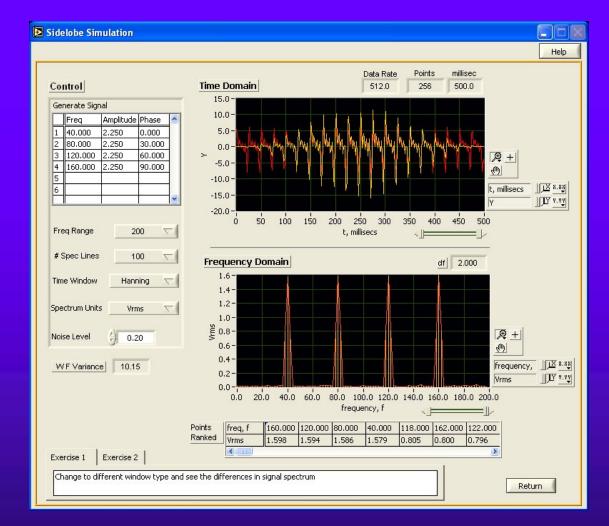
- What you will learn?
 - 1. Concept of leakage effect.
 - 2. How to reduce the leakage effect?

Windowing Simulation



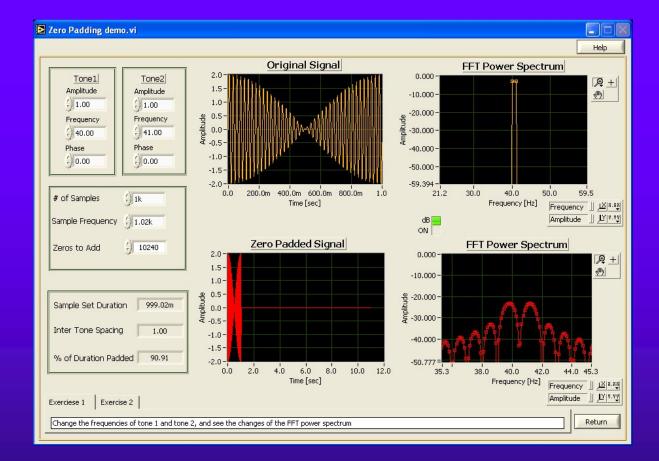
- 1. Concept of Windowing.
- 2. Common used Window types.
- 3. Characteristics of different Windows.
- 4. Strategies of choosing Window function.

Sidelobe Simulation



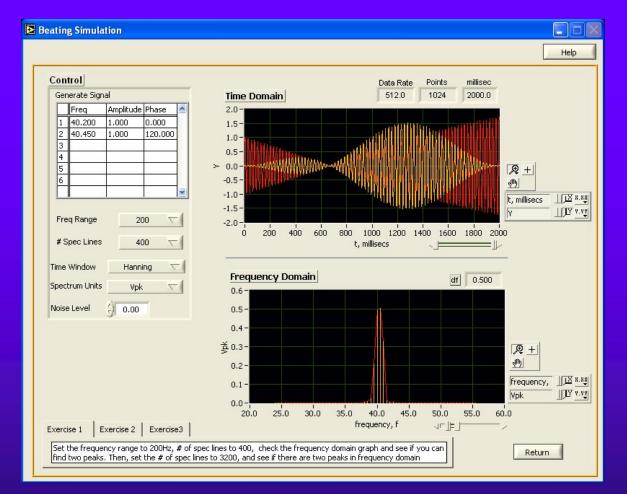
- What you will learn?
 - 1. Concept of Sidelobes.
 - 2. Frequency characteristics of windows.
 - 3. Existence of Sidelobes.

Zero Padding Simulation



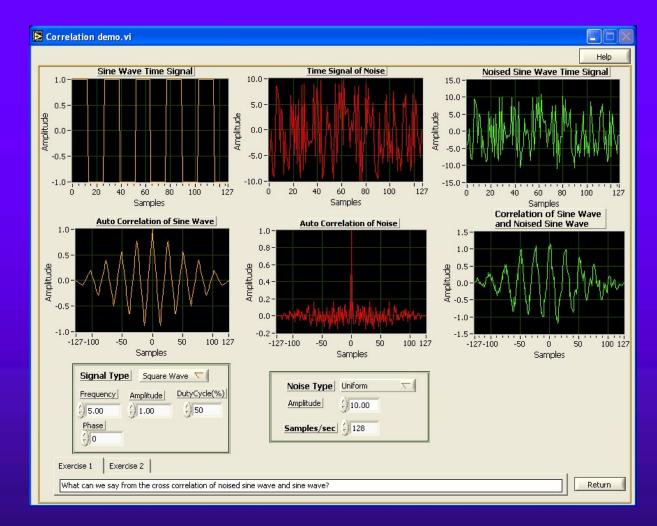
- 1. Concept of Zero Padding.
- 2. Why Zero Padding is useful.
- 3. The limitation of Zero Padding.

Beating Simulation



- What you will learn?
 - 1. Concept of Beating.
 - 2. When beating will happen?
 - 3. How to choose frequency resolution to avoid Beating?

Correlation Simulation



- What you will learn?
 - 1. Concept of Correlation.
 - 2. Application of Correlation.

Summary Simulation

 Final simulations to test your knowledge

Contact!

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