

University Of Bourgogne

Digital Signal Processing

Quantization & Encoding

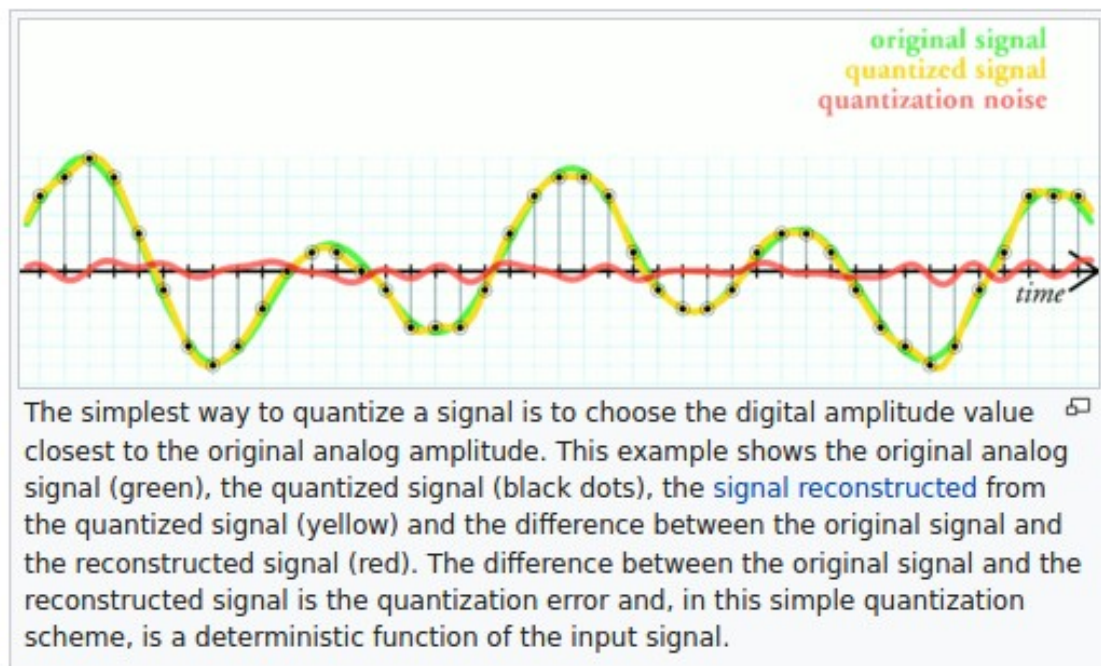
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Quantization:

Quantization, in mathematics and [digital signal processing](#), is the process of mapping input values from a large set (often a continuous set) to output values in a (countable) smaller set, often with a finite [number of elements](#). [Rounding](#) and [truncation](#) are typical examples of quantization processes. Quantization is involved to some degree in nearly all digital signal processing, as the process of representing a signal in digital form ordinarily involves rounding. Quantization also forms the core of essentially all [lossy compression](#) algorithms.



Encoding:

Encoding is the process of converting the data or a given sequence of characters, symbols, alphabets etc., into a specified format, for the secured transmission of data. Decoding is the reverse process of encoding which is to extract the information from the converted format.

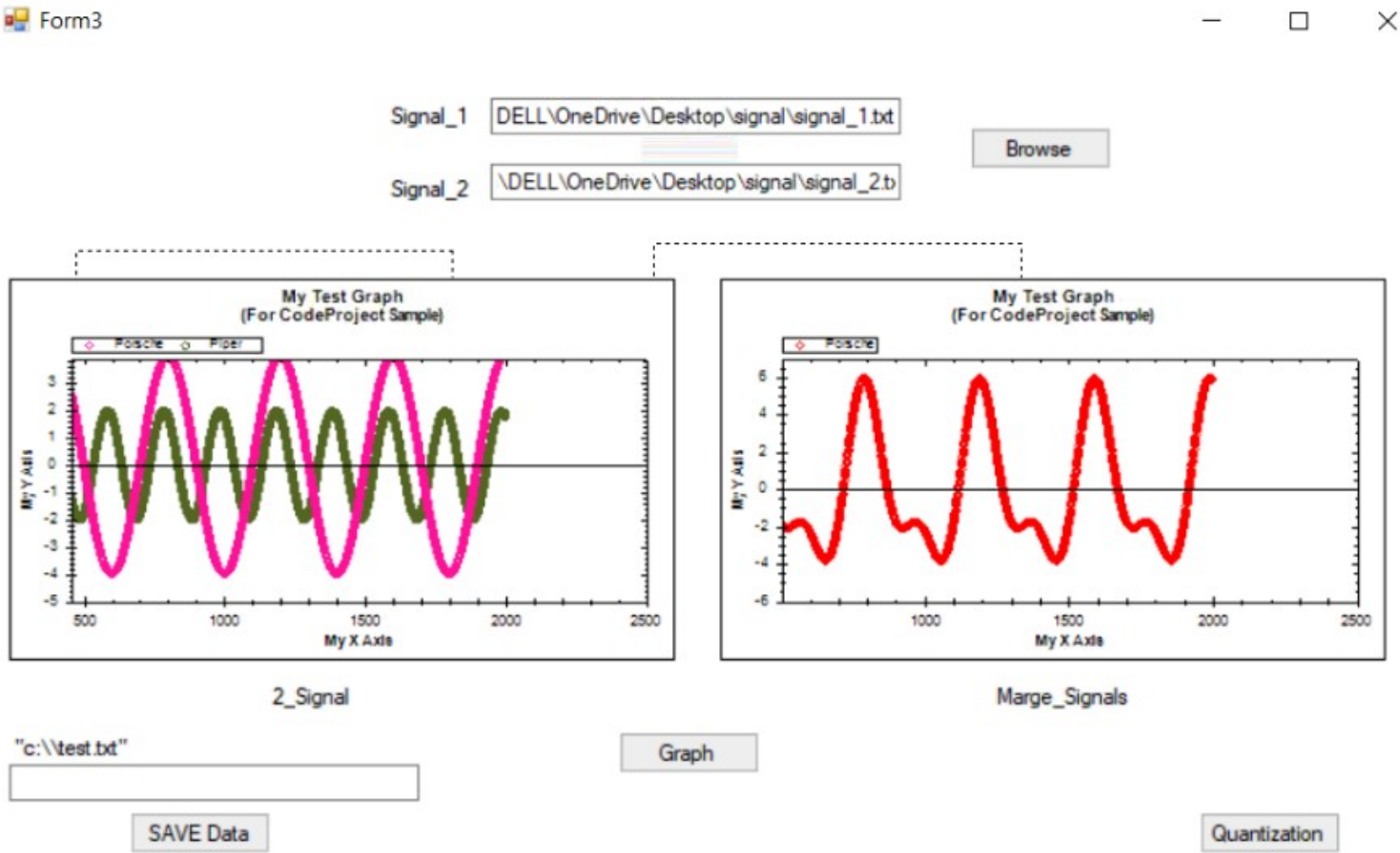
Encoding is the process of using various patterns of voltage or current levels to represent 1s and 0s of the digital signals on the transmission link.

The common types of line encoding are Unipolar, Polar, Bipolar, and Manchester.

DSP System (Quantization & Encoding):

Add to The application the following features:

- 1. The ability to add two input signals and display the resulted signal on the graph and its voltage values in a text file.
- 2. The ability to quantize and encode an input signal (its samples)
- 3. the application ask the user for the needed levels or number of bits available (in case of number of bits the application should compute from it the appropriate number of levels).
- 4. the application should display the quantized signal and display the computation table in a data grid.



☐ #bits
 Number_Of_Bits

c:\signal\signal_2.txt

Signal

Quantization_Level

16

	x(n)	Initial_Index	xq(n)	enCode	eq(n) = xq(n) - x(n)
	1.755165123780...	15	1.874993392416...	11111	0.119828268635...
	1.724180815565...	14	1.624994273427...	11110	-0.09918654213...
	1.691494949049...	14	1.624994273427...	11110	-0.06650067562...
	1.657139781234...	14	1.624994273427...	11110	-0.03214550780...
	1.621149216524...	14	1.624994273427...	11110	0.003845056903...
	1.583558773261...	14	1.624994273427...	11110	0.041435500166...
	1.544405548674...	14	1.624994273427...	11110	0.080588724753...
	1.503728182269...	14	1.624994273427...	11110	0.121266091158...
	1.461566817695...	13	1.374995154438...	11101	-0.08657166325...
	1.417963063129...	13	1.374995154438...	11101	-0.04296790869...

