

BENC 4173: MULTIMEDIA TECHNOLOGY & APPLICATION
TUTORIAL 3: Data Representation and compression

1. List 5 basic process that multimedia data need to deal with.
2. Differentiate static and continuous media
3. Define analog signal and digital signal. Give example of each
4. Compare digital and analog signal in terms of its pros and cons
5. Describe the process/phenomena of ADC and DAC. Use an illustration to support your answer
6. ADC has two subprocess which are sampling and quantization; by using audio and image as you example, describe each process
7. Describe each multimedia term:
 - a. Aliasing
 - b. Datarate
 - c. Bitdepth
 - d. Sampling resolution
 - e. Undersampling
 - f. harmonics
8. State the theory of Nyquist theorem:
9. Differentiate between Nyquist frequency and Nyquist Rate
10. With the given equation, define signal to noise error (SQNR)
11. Define the dynamic range for digital image and digital audio (decibel). Give equation as necessary
12. Differentiate temporal and spatial compression
13. Elaborate on lossy and lossless types of compression. Give example of file type for audio and image.
14. Describe the chronology of compression history in multimedia
15. Give an equation of compression ratio for offline data and streaming data
16. Differentiate each compression types
 - a. Repetitive Sequence Suppression*
 - b. Run-length Encoding*
 - c. Pattern Substitution
 - d. Entropy Encoding
 - i. The Shannon-Fano Algorithm*
 - ii. Huffman Coding*