

1. What is the typical bit length used to represent each character in ASCII encoding, and how many characters are represented in the example "Virtual University"?

Answer: In ASCII encoding, each character is represented using 8 bits (1 byte). The example "Virtual University" has 18 characters, so it would require $18 * 8 = 144$ bits or 18 bytes.

2. What is the limitation of ASCII codes in terms of the number of characters it can represent, and what organization introduced extensions to address this limitation?

Answer: ASCII codes can represent only 128 characters. To address this limitation, the International Organization for Standardization (ISO) introduced extensions to support Western language symbols.

3. How does the Unicode system differ from ASCII, and what is the significance of Unicode's unique patterns of 21 bits?

Answer: Unicode is an internationalization of codes that uses unique patterns of 21 bits for each character. This is a significant improvement over ASCII because it can support thousands of character sets, including those used in Chinese, Hebrew, and Japanese, whereas ASCII is limited in its character repertoire.

4. What is the advantage of using MIDI for representing sound, and how does it differ from traditional sound encoding methods?

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Answer: MIDI (Musical Instrument Digital Interface) is advantageous because it encodes directions for producing music rather than storing the actual audio data itself. This results in much smaller file sizes compared to traditional sound encoding methods, which store the audio data directly. MIDI is more like encoding the "sheet music" that a performer reads rather than the performance itself, making it more efficient for storage and transmission.

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