Assignment-2

**What is an Encoding Format?**

An **encoding format** is a standardized method for converting data into a specific format that is optimized for storage, transmission, and interpretation by computers. Encoding formats ensure that data is represented in a consistent manner, enabling different systems to understand and process the information correctly.

**Encoding Formats for Various Types of Data**

**1. Text Encoding Formats**

* **ASCII (American Standard Code for Information Interchange)**: A character encoding standard for text, representing each character as a number between 0 and 127.
* **UTF-8 (Unicode Transformation Format - 8-bit)**: A variable-width character encoding that can represent every character in the Unicode character set.
* **UTF-16**: Another Unicode encoding format, using 16-bit code units.
* **UTF-32**: A fixed-width encoding format using 32 bits for each character.
* **Base64**: Encodes binary data into ASCII characters, commonly used in email and web data.

**2. Number Encoding Formats**

* **Binary**: Represents numbers in base-2 (0 and 1).
* **Hexadecimal**: Represents numbers in base-16, often used in computing.
* **BCD (Binary-Coded Decimal)**: Encodes each digit of a decimal number into its binary equivalent.
* **IEEE 754**: A standard for floating-point arithmetic, representing real numbers in a computer.
* **Big Endian / Little Endian**: Refers to the order in which bytes are arranged within larger data types.

**3. Photo/Image Encoding Formats**

* **JPEG (Joint Photographic Experts Group)**: A commonly used method of lossy compression for digital images.
* **PNG (Portable Network Graphics)**: A lossless image format that supports transparency.
* **GIF (Graphics Interchange Format)**: A format that supports both animated and static images, typically with limited color palettes.
* **BMP (Bitmap)**: A raster graphics image file format used to store digital images.
* **TIFF (Tagged Image File Format)**: A versatile format for high-quality image storage, often used in professional photography and printing.

**4. Audio Encoding Formats**

* **MP3 (MPEG-1 Audio Layer III)**: A popular lossy audio format that compresses sound data.
* **WAV (Waveform Audio File Format)**: An uncompressed audio format that provides high-quality sound.
* **AAC (Advanced Audio Coding)**: A lossy audio compression format, often used in streaming and mobile devices.
* **FLAC (Free Lossless Audio Codec)**: A lossless audio compression format, preserving the original quality of sound.
* **OGG**: A free, open container format that supports various audio codecs like Vorbis.

**5. Video Encoding Formats**

* **MP4 (MPEG-4 Part 14)**: A digital multimedia container format commonly used to store video and audio.
* **AVI (Audio Video Interleave)**: A multimedia container format introduced by Microsoft, used for storing video and audio data.
* **MKV (Matroska Video)**: An open-source container format that can hold an unlimited number of video, audio, and subtitle tracks.
* **MOV**: A format developed by Apple for the QuickTime player, often used in professional video editing.
* **H.264 / H.265 (MPEG-4 AVC / HEVC)**: Video compression standards commonly used for recording, compression, and distribution of video content

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