**1). Please explain how to transform an assembly language program into a binary executable file using the necessary reference tables.**

**Ans:** Text (characters) that describes the data pieces and the processing necessary to carry out some crucial information processing jobs can be found in source" software files. This textual description can take several forms depending on the particular "language" being utilized. These "languages" can be broadly categorized into two groups: "high-level" and "low-level" (or "assembler") languages. In either scenario, it is necessary to translate the textual description from text (characters) into the binary patterns that the computer's internal circuits utilize to specify and regulate the necessary actions. A program known as a "compiler" converts "high-level" source program files into these binary patterns, also known as "machine-level code." A "compiler" converts a single "high-level" statement into several (sometimes, many) "machine-level" instructions. Each "machine-level" action is represented by a single, straightforward "low-level" textual code, known as a "mnemonic" code, and is translated into a single "machine-level" instruction by a "assembler," which is a comparable but much simpler translating software. Although it would be a laborious process to construct really big programs or systems, mnemonic coding offers a suitable means to operate the computer at the machine level.

**2). Please explain the formats of the different types of data (image, video, audio, and alphanumerical, integers, floating-point numbers).**

**Ans: Image**

a) TIFF (Tagged Image File Format): This type of images consumes more memory space to store because they are uncompressed and carry a large amount of data of the image.

Use: Photo software, Page layout software

b) JPEG (Joint Photographic Experts Group): These types of images are compressed to carry a large amount of data in the small size of the file. Sometimes it loses the detail of the image while compressing.

Use: Digital camera, online photographs

c) GIF (Graphics Interchange Format): GIF format type of images is also compressed files but not same as “JPEG”. Images are not losing their data while compressing and that’s why they have a larger size of the file than JPEG.

Use: for creating an animations

**Video**

1. FLV (Flash Video): On each platform, each browser supports flash videos because they carry both progressive as well as streaming downloads. It is encoded by Adobe Flash software.

b) AVI (Audio Video Interleave): This is the oldest format and produced by Microsoft. Mostly all popular web browser supports AVI videos.

c) MP4 (Moving Picture Experts Group): They become more popular than the FLV because it can save online audio and visual streams. It provides high quality with a small size of the file.

**Audio and Alphanumerical**

a) PCM (Pulse Code Modulation): Firstly, the existence of an analog sounds is in a waveform, later it transfers into digital bits. It stores data without any compression.

Use: In CD and DVD

b) MP3 (MPEG Audio Layer 3): Nowadays the most popular audio format is MP3. The best thing of this format is it breaks down the sound data which are outside the limit of hearing of people and very efficiently compresses the rest of the sound data.

Use: In PCs, Macs, Smart TVs

c) AIFF (Audio Interchange File Format): As WAV created by Windows and IBM, Apple created AIFF format for MAC in 1988. It is also a compressed version. It contains PCM formats data in an uncompressed form and acts as a wrapper for PCM encoding to make compressed data.

**Integers**:

1. They are whole numbers contains positive, negative and zero value. There are different types of integers as follows,

Byte contains 8 bits example: 56

Char contains 16 bits example: B,

Short contains 16 bits example: 56

Int contains 32 bits example: 56

Long contains 64 bits example: 56L.

**Floating point numbers**:

1. It is a fractional number with a decimal point, not a whole number. There are two types as follows,

Float contains 32 bits example: 65f

Double contains 64 bits example: 65.50

References

<http://teaching.idallen.com/dat2343/10f/notes/370_LMC_link.html>

<https://www.ddegjust.ac.in/studymaterial/mca-5/mca-101.pdf>