

# Multimedia Compression Job Interview Questions And Answers



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# Multimedia Compression Interview Questions And Answers Guide.

## Question - 1:

Explain the JPEG modes of operations?

### Ans:

Following are the JPEG operation modes:

- Lossless Mode: Every pixel in the image is encoded even though the compression ratio is low.
- Sequential Mode: A single scan from left-to-right and top-to-bottom compresses the image.
- Progressive Mode: Multiple scans are used to compress the image. The transmission time is long.
- Hierarchical Mode: Multiple resolutions are used to compress the image. Hence the lower resolution is accessed first which does not require the decompressing the whole resolution of the image.

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## Question - 2:

What is Discrete Cosine Transform?

### Ans:

1. It is similar to Fast Fourier Transform.
2. The frame blocks of size 8x8 or 16x16 pixels are represented as frequency components.
3. This transforms into frequency domain by implementing standard formula.

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## Question - 3:

What is Motion Estimation?

### Ans:

1. Two successive video frames often have small differences.
2. MPEG standard has a standard to reduce this temporal redundancy.

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## Question - 4:

What is Reduction of the Resolution?

### Ans:

1. Performs the conversion of RGB-color space into YUV color components.
2. The chrominance components U and V can be reduced to half of the pixels in the horizontal direction.

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## Question - 5:

Do you know about 3-level Hierarchical JPEG Encoder?

### Ans:

- Down-sample the factors of resolution by 2 for each dimension. For example - ,Reduce the 640 x 480 resolution to 320 x 240 resolution.
- Code the smaller image with another JPEG mode.
- Decode the image and up the sample encoded image.
- Encode the difference between the decoded image and the original image.
- The above process can be repeated for multiple times.
- This process provides high quality images with low resolution display.

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## Question - 6:



Explain some major steps for JPEG compression?

**Ans:**

Following are the major steps that are involved in JPEG compression:

- Discrete Cosine Transformation.
- Quantization.
- Zigzag Scan.
- DPCM on DC component.
- RLE on AC Components
- Entropy Coding.

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**Question - 7:**

Explain the features of JPEG 2000 standard?

**Ans:**

Following are the JPEG 2000 features.:

- Compression performance is at low bit-rate.
- Both lossless and lossy compression is performed with a single code stream.
- The transmission in noise environment can be done with low bit-error rate.
- It is applicable for both gray and color images.
- Bi-level imagery, natural imagery and computer generated imagery is applicable for gray and color images.
- It is interactive with MPEG-4 standard.
- Wavelets will be replaced with Discrete Cosine Transform

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**Question - 8:**

What is MPEG-2?

**Ans:**

- MPEG-2 is one of the international standards for compressing video signals.
- Videos can be compressed prior to transmission or storage.
- The approximate compression ratio is 50:1 of the digital size.
- MPEG-2 standard is widely implemented in digital TV transmission with 200 million decoders.
- MPEG-2 standard exploits the redundancies in the original signal.

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**Question - 9:**

Do you know what are the desirable properties of a speech coder?

**Ans:**

Following are the desirable properties of speech coders:

- Low Bit-Rate.
- Low Memory Size
- Low Coding Delay
- High Speech Quality
- Robustness Across Different Languages / Speakers
- Robustness in the Presence of Channel Errors
- Good Performance on Non-Speech Signals, like telephone signaling.

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**Question - 10:**

Tell me what is Vocoder?

**Ans:**

- Vocoder is one of the audio processors
- The characteristic elements of an audio signal are captured by Vocoder.
- These characteristic signals are used to affect the other audio signals.
- It is widely used in speech synthesis.
- A component known as Formant describes the frequency of a sound and noise components that are associated.
- The audio output of Vocoder has synthesized sound that is modulated by a filter.
- The synthesized sound is pulsed to the tempo of the user input voice with the tonal characteristics of the voice.

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**Question - 11:**

What is MPEG-1 Audio compression standard?

**Ans:**

- MPEG-1 is a lossy compression standard for both video and audio.
- It compresses VHS quality raw digital video down to 1.5Mega Bits per Second.
- The compression ration is 26:1
- MPEG-1 introduced MP3 audio format.
- The standard consists of -
  1. Systems including synchronization of video, audio and other data.
  2. Compressed Video content.
  3. Compressed Audio content.



4. Conformance testing.
5. Reference software.

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### Question - 12:

Do you know what is Delta modulation and explain its features?

#### Ans:

- A technique that converts analog to digital and digital to analog signal conversion.
  - It is to transmit voice information.
  - It encodes the differences between successive samples into n-bit data streams.
  - The transmitted data is reduced to 1-bit data stream.
- Following are the features of Delta Modulation:
- A series segments are used to approximate the analog signal.
  - The approximated signal is compared with analog wave for determining the increase or decrease in relative amplitude.
  - Only the increase or decrease of the signal amplitude is only sent.

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### Question - 13:

Do you know what is OptimFROG?

#### Ans:

- OptimFROG is one of the lossless audio compression scheme.
- The goal of OptimFROG is to reduce the size of an audio file to the maximum.
- It permits bit identical restoration for all inputs.
- It is like ZIP type of compression and specialized for audio data compression.
- OptimFROG obtains asymptotically the best lossless compression ratios for audio files.
- It can be plugged-in with Windows, Linux, Mac operating systems for Windows Media Player, Foobar2000, Winamp2/3/5, XMPLay, QCD players.
- It supports for all integer PCM wave formats up to 32 bits.

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### Question - 14:

What is Lempel-Ziv-Welch (LZW) coding scheme?

#### Ans:

- LZW is a loss less data compression algorithm accepted world wide.
- This algorithm has high throughput potential in implementation.
- The high level algorithm goes like this:
  1. Assign all the strings to dictionary.
  2. Identify the longest string L available in the dictionary which matches the existing input.
  3. Find the dictionary index for L to get the output and remove L from the input.
  4. Concatenate L by the next symbol of the input to the dictionary.
  5. Repeat the process from step 2.

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### Question - 15:

What is JPEG Encoder?

#### Ans:

- JPEG encoder has three main blocks namely, Forward Discrete Cosine Transform, Quantizer and Entropy Encoder.
- JPEG encoder is the main component for lossless and hierarchical encoders.
- It is suitable for gray scale and color images.
- Each image is divided into 8 x 8 blocks.
- A group of 4 tables are specified by JPEG.
- If the table has quality value with 1, then the quality is best and compression is lowest.
- If the table has quality value with 2, then the quality is best and compression is highest.

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### Question - 16:

What is lossless source coding?

#### Ans:

- Lossless source coding is one of the data compression standards.
- Lossless source coding allows the decompression assures the exact copy of the original data.
- Images, audio and video files use lossless source compression standard.
- Lossless source encoding is suitable for compressing text files.
- It produces fixed length symbols.

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### Question - 17:

Tell me about Nyquist Rule?

#### Ans:

- Nyquist Rule is one of the mathematical expressions.
- While sampling the frequency, the sampling frequency is multiplied twice.



- The signal should not contain a Fourier spectrum with sine or cosine above the frequency.
- The signal can be reconstructed by sampling at twice the frequency.
- The signal can not be reconstructed if the signal is not sampled at twice the frequency.
- Nyquist is required only for digital signal processing but not for analog signal processing.

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### Question - 18:

Can you explain what is MPEG-7?

#### Ans:

- MPEG-7 is an ISO/IEC standard for MPEG.
- MPEG-7 is not aimed at any one of the applications in particular.
- MPEG-7 provides a set of audio and video description tools for creation of descriptions.
- It allows efficient access to multimedia content.
- MPEG-7 allows various granularities in its description.
- When the content is encoded, it provides certain relations in synchronous fashion.
- The descriptions to elements for different objects like audio / video / image objects within a particular scene, is attached by descriptions.

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### Question - 19:

Do you know what is MPEG-21?

#### Ans:

- A multimedia framework to enable transparent and augmented use of multimedia resources.
- Complete multimedia content creation, production, delivery is done with MPEG-21.
- MPEG-21 allows to use the existing multimedia components to be used together.
- The basic architectural concept of MPEG-21 framework is the Digital Item.
- Digital Items are digital objects which includes standard representation and identification of multimedia.
- Digital Item is a combination of resources such as videos, audio tracks, images, metadata and structure that describes the relationship among resources.

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### Question - 20:

Do you know what applications are suitable for using MPEG-21?

#### Ans:

MPEG-21 is suitable for variety of applications. They are:

- Digital Libraries
- Asset management
- Cataloguing in publication
- Broadcast usage
- Publishing
- Trade transactions
- Content filtering
- Music/Video Releases

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### Question - 21:

Explain the advantages and disadvantages of video compression?

#### Ans:

Following are the advantages of Video Compression:

- Occupies less disk space.
- Reading and writing is faster.
- File transferring is faster.
- The order of bytes is independent.

Following are the disadvantages of video compression"

- Compilation need to be done again for compression.
- Errors may occur while transmitting data.
- The byte / pixel relationship is unknown
- Has to decompress the previous data.

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### Question - 22:

Do you know what is compression? Why is it necessary to compress files?

#### Ans:

- Compression refers to reducing the original file size.
- Video and audio files consume more disk space compared to document files.
- While sending the files as attachments in an email, the email may not send the file, as the size is more than it takes.
- Compressed files with less disk space can be sent as attachments in an email.
- Compressed files reduce time to attach, upload and download files.
- Some of the internet servers need only compressed files to upload and download.

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### Question - 23:



Multimedia Compression Job Interview Questions Part Twelve!

**Ans:**  
What do you mean by multimedia? Name few of the broad categories multimedia can be divided into. Also give few examples of each category.  
Name few of the multimedia softwares that you came across till now.  
What are multimedia hardwares? Give few examples.  
What do you understand by multimedia authoring tools? Give few examples.  
What MIME stands for? Give few examples.  
What are the components of multimedia?  
Explain scope of the multimedia.  
Pour some light over Human Computer Interface.  
What are the advantages of a digital media?  
Give few examples of the digital audio procession hardware.

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### Question - 24:

Multimedia Compression Job Interview Questions Part Eleven!

**Ans:**  
How compatible is multimedia with internet?  
What do you understand by sampling rate?  
What is MIDI?  
What are the guidelines for effective use of audio in multimedia applications?  
What does OBEX stands for?  
What is SVG & how it is different from VML?  
Name few of the applications of multimedia.  
What does CD stand for? Name few standards related to it.  
How many minutes of audio & video can be stored over an audio cd & video cd respectively?  
Explain difference between bitmap & vector images.

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### Question - 25:

Multimedia Compression Job Interview Questions Part Ten!

**Ans:**  
What is the sampling rate of an audio cd?  
What do you understand by persistence of vision?  
Define Tweening.  
What do you know about anti-aliasing?  
What is difference between digital & analog data?  
Describe time-based authoring.  
What is the difference between video & animation?  
Assume the following: We have a 20 second video clip that displays at 30 frames a second. The video's dimensions are 640x480 and the video is created in "true" color (3 bytes per pixel). What is the file size of the video?  
In traditional video (tape) there is a standard code to provide exact synchronization. Which of the following is NOT part of that code?  
What do you mean by rigging?

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### Question - 26:

Multimedia Compression Job Interview Questions Part Nine!

**Ans:**  
What does VGA & SVGA stand for? Explain both of them.  
Name few of the digital picture compression techniques.  
Explain RGB color space model. What is RGBA? How it is different from RGB?  
What does JBIG stands for? Compare JPEG with JBIG.  
What is YCrCb?  
Name few of the techniques used for digital video compression.  
Give a brief overview of MPEG1 standard.  
What does I, P & B frames stand for (in context of MPEG1)?  
Explain QuickTime. How is it different from MPEG?  
What is wavelet compression technique?

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### Question - 27:

Multimedia Compression Job Interview Questions Part Eight!

**Ans:**  
Compare Fractal compression with wavelet compression.  
Pour some light over MPEG7.  
Give few examples of optical drives you know.  
Which optical media has the highest capacity?  
Explain CD-I.  
Explain DVI.  
Compare CD-ROM XA with CD-I.  
Explain Digital Video Disc.  
Name few of the organizations that played important role in the development of CD ROM Technology.



What is multimedia conferencing?  
Explain H.320 multimedia conferencing standards.  
What do you know about IPTV?  
Explain Mosaics.  
Name few of the music synthesizing instruments.

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### Question - 28:

Multimedia Compression Job Interview Questions Part Seven!

#### Ans:

What is the compression? Why is it necessary to compress files?  
What is the meaning of multimedia? Give few examples.  
Explain Data Compression problem. What are the components of that problem?  
What are the system issues & performance criteria that have to be kept in mind?  
What do you mean by lossless source coding?  
Explain instantaneous variable length codes.  
What do you mean by unique decipherability?  
Using appropriate diagrams explain Huffman coding.  
Information theory plays an important role in field of compression. Define basic concepts of it.  
What are non-binary Huffman codes?

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### Question - 29:

Multimedia Compression Job Interview Questions Part Six!

#### Ans:

Pour some light over Kraft Inequality & Optimality.  
Explain line drawing compression.  
What do you mean by entropy?  
How entropy is related for the performance measures?  
Write any three techniques for lossy compression.  
Tell the taxonomy of compression techniques.  
What do you mean by companded quantization?  
What do you understand by modeling?  
Give any two characteristics of a code.  
Name the two types of quantization errors.

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### Question - 30:

Multimedia Compression Job Interview Questions Part Five!

#### Ans:

What are two types of adaptive quantization?  
What do you mean by forward adaptive quantization? What is its significance?  
Pour some light over optimum prefix codes.  
What are the applications of arithmetic coding?  
Give few applications of LZW coding scheme.  
What does static dictionary means?  
Pour some light over shannon-fano coding.  
What do you understand by Half-Toning in context of Fax?  
Name few universal Lossless Sound compression algorithms.  
What do you mean by Adaptivity & Universality?

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### Question - 31:

Multimedia Compression Job Interview Questions Part Four!

#### Ans:

What do you mean by Elias Coding?  
Explain quantization.  
What do you mean by scalar quantization? Name few schemes of scalar quantization.  
What is vector quantization? How is it different from scalar quantization?  
What do you mean by predictive coding?  
Explain the linear prediction model.  
What is Delta modulation & differential PCM?  
What do you mean by perceptual weighting & postfiltering?  
Name few linear predictive speech coding standards.  
Explain frequency domain coding.

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### Question - 32:

Multimedia Compression Job Interview Questions Part Three!

#### Ans:

Compare wavelet coding with fractal coding.





Name few frequency domain speech & audio coding standards.

Explain MPEG-1 Audio compression standard.

What are the improvements in MPEG-2 audio over MPEG-1 audio compression?

Explain JPEG still image compression standard.

What is difference between JPEG & JPEG2000?

What do you understand by progressive encoding?

Name all modes in which a jpeg compression technique can work.

Is it possible to have a lossless compression over a still image using jpeg standard?

What do you understand by multimedia conferencing?

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### Question - 33:

Multimedia Compression Job Interview Questions Part Two!

#### Ans:

Give few examples of multimedia conferencing standards.

Explain how delays in multimedia conferencing systems are dealt with?

Name few video compression standards. Which is currently best compression standard available in the market?

Explain MPEG video compression standard.

What are the components of MPEG compression technique?

What is the role of syntactical layering in MPEG?

What do you mean by frequency domain decomposition?

Explain how temporal predictions are used in mpeg algorithm?

What do you understand by data rate of an audio or video stream?

What is sampling rate? What significance it play?

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### Question - 34:

Multimedia Compression Job Interview Questions Part One!

#### Ans:

What does AAC standard for? Explain how it works?

What do you understand by rate distortion theory?

Define lossless channels.

What are the parameters used in silence compression?

Define vocoders.

Explain decimation & interpolation.

Why cutoff frequency for anti-aliasing filter is 7khz & 8khz?

How masking qualities of human ear is used in reducing number of bits in uniform quantiser?

Give the Nyquist rule.

What are the disadvantages of video compression?

Explain MPEG-7.

Describe the aims of MPEG-21.

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