Compression Standard Interview Questions And Answers Guide.

Compression Standard Job Interview Preparation Guide.

Question # 1

Explain what is lossless source coding?

Answer:-

- A data compression technique, which reverts an exact copy of original file.
- Lossless Source Coding is used for compressing text files in modems.
- Lossless Source Coding is a building block for designing lossy compressors.
- Lossy compression is implemented for images, sound and video files for effective data compression.
- Many compression techniques have a lossless mode.
- The lossless source coding involves a sequence of fixed length symbols.
- Each of these symbols is easily manipulated independently.

Read More Answers.

Question # 2

Can you explain information theory plays an important role in field of compression

Answer:-

- Information Theory is about quantification of information.
- It is used in compressing data.
- Entropy is a key measure of information.
- It is expressed in terms of average number of bits that are required to store a message.
- Entropy is used to quantify the uncertainty which is a process in predicting the random variable values.
- Lossless data compression, Lossy data compression and channel coding are the fundamental topics of information theory.

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Question # 3

Do you know instantaneous variable length codes?

Answer:-

- A code that maps source symbols into a set of variable number of bits.
- A VL code compresses the sources and decompresses with zero error.
- By implementing a right coding strategy, an identically distributed source might be compressed almost close to its entropy.
- This process is in contrast to fixed length coding methods.
- Examples of variable-length codes are Huffman coding, LempelZiv code.

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Question # 4

Can you explain what is file compression and why is it necessary to compress files?

Answer:-

- File compression is a process to reduce the disk space to store that file.
- File compression enables data to be transferred quickly.
- Disk space needed on internet servers is reduced. This allows the servers to store more files / information with less disk space.
- File compression reduces the amount of time on internet to upload or download a file.
- Compression hides data so that not all computers can read the information stored.
- File compression is a mandatory preference for some of the internet servers to transfer files.

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Question # 5

What is unique decipherability?

Answer:-

- Data symbols are encoded with coding schemes for fixed length codes.
- Every coding scheme has unique code.

- This unique encoded character ensures unambiguous.
- The encoded strings have fixed length.
- The fixed length codes are always uniquely decipherable.

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Question # 6

Do you know non-binary Hoffman Codes?

Answer:-

- The non-binary Hoffman code elements are derived from an alphabet 'm' is > 2 letters.
- All the symbols â€˜m' which occur least frequently will be having the same length.
- The lowest probability of the symbols â€˜m' will differ only in the last position.
- The letters that combine have code words of the same length.
- The symbols that have lowest probability will have code words with long length.

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Question # 7

Tell me what are the parameters that are used in silence compression?

Answer:-

- Silence compression is used in compressing sound files.
- It is equivalent to run length coding on normal data files.
- The parameters are:
1. A threshold value. It is a parameter that specifies, below which the compression can be considered as silence.
2. A silence code followed by a single byte. It indicates the numbers of consecutive silence codes are present.
3. To specify the start of a run of silence, which is a threshold.

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Question # 8

Do you know what is rate distortion theory?

Answer:-

- Distortion theory is about trade-offs between the rate and distortion.
- It is applied for compression schemes.
- An average number of bits are utilized to represent each sample value.
- If the rate of bits is decreased it is known as increase in distortion.
- If the rate of bits to represent each value is increased it is known decrease in distortion.

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Question # 9

What is Huffman Coding?

Answer:-

- An entropy encoding algorithm.
- It uses variable length code table for encoding source symbol.

Read More Answers.

Question # 10

What is Shannon Fano Coding?

Answer:-

- It is used to construct a prefix code that is based on a set of symbols.
- It suboptimal. The lowest expected code word length will not be achieved.

Read More Answers.

Question # 11

What is Arithmetic Coding?

Answer:-

- A variable-length entropy encoding form.
- It is used for implementing loss less data compression.
- Fewer bits are occupied when frequently used characters are represented. More bits are occupied when not-so-frequently used characters are represented.

Read More Answers.

Question # 12

What is Sub Band Coding?

Answer:-

- Sub Band Coding(SBC) is a transform coding.
- A transform code can break a signal that may result in many different â€˜frequency bands'.
- Every transform code is encoded independently.
- Most of the time, it is used for compressing audio and video signals.

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Question # 13

What is Wavelet Based Compression?

Answer:-

- It is a process where a well defined temporal support for â€˜wiggles' about X-axis.
- The inner-product of the input signal is multiplied with a set of ortho-normal basis functions.
- Then the coefficients are computed by this inner-product.

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Question # 14

What is Vector Quantization?

Answer:-

- Vector Quantization has quantizes as inputs and outputs.
- The vector quantization results in a distortion rate.
- This rate is lower than the scalar quantization.

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Question # 15

Explain the taxonomy of compression techniques?

Answer:-

- They are classified based on the requirements of reconstruction and compression of data.
- They are Lossy Compression and Lossless Compression.

Read More Answers.

Question # 16

What do you know about companded quantization?

Answer:-

- Companded Quantization maps the input through compressor function.
- This function expands the probability to the high level regions.
- These regions are close to the origin.
- These regions are compresses the corresponding lower probability regions that are away from the origin.
- The output of Companded Quantization is resulted by using uniform quantizer.
- An expander function is used to transform the quantized value.

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Question # 17

Tell me about optimum prefix codes?

Answer:-

- Prefix coding is known as optimum coding.
- More frequently occurred symbols have shorter code words.
- Less frequently occurred symbols have longer code words.
- The less occurred frequently symbols will have equal length.
- Optimum prefix codes enhance the efficiency of data compression.

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Question # 18

Explain forward adaptive quantization?

Answer:-

- The source output is divided into various blocks of data.
- Every block is analyzed prior to quantization.
- As per the block analyses, the quantizer parameters are set.
- These settings are transmitted later to the receiver.
- The transmitted settings are served as side information at the receiver end.

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Question # 19

Explain composite source model?

Answer:-

- It is not simple to use a single model to describe the source in many applications.
- In these scenarios, a composite source model is used.
- Composite Source Model uses only one source.
- Only single source is activated at a given point of time.

Read More Answers.

Question # 20

Do you know prefix codes?

Answer:-

- A prefix code is a code which does not require code word as a prefix to another code word.
- Huffman code is an example for Prefix Code.

Question # 21

Explain characteristics of a code?

Answer:-

- A code should be decodable.
- The code words are shorter than the letters which occur less frequently, has code word letters that occur more frequently.

Question # 22

Tell me two types of quantization errors?

Answer:-

1. Granular error
2. Slope over load error.

Question # 23

Explain two types of adaptive quantization?

Answer:-

1. Forward Adaptive Quantization
2. Backward Adaptive Quantization.

Question # 24

Explain offset in LZ77 approach?

Answer:-

- The sequence encoding in the look ahead buffer is encoded in this technique.
- The encoding id done by moving the encoder to a search pointer.
- The search pointer is through until a match to the first symbol is encountered.
- This symbol is available in the look ahead buffer.
- The actual distance between the pointer and the look ahead buffer is known as offset.

Question # 25

What is Progressive Transmission?

Answer:-

- A low resolution of an image is sent first.
- IT needs only few bits for the purpose of encoding.
- The image is then updated to the required fidelity.
- This is done by transmitting more information.

Question # 26

What is Lossless Channel?

Answer:-

- The lossless channel is described by a channel matrix.
- It is described with only one non-zero element in each column.
- During transmission, no source information is lost.

Question # 27

Do you know about Digram Coding?

Answer:-

- It is one of the static dictionary coding forms.
- The dictionary consists all of the letters of the source alphabet.
- These letters are followed by many pair of letters. These are known as Digrams.
- Two character input is read by digram encoder.
- The dictionary is searched by the encoder for the existence of inputs.
- If input exists, the index is encoded and transmitted.

Question # 28

What is vocoders and what are the types channel vocoders?

Answer:-

- Vocoders stands for Voice Coders.
- Synthetic sound is reproduced with artificial quality.
- Vocoders transmit signals with low bit rate, usually in the range of 1.2 to 2.4 KB.
- Model parameters are used by the receiver along with the transmitted parameters.
- Model parameters then synthesizes the approximation to the source output.
- The channel vocoders are linear predictive coders and code excited linear prediction.

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