

Data Compression

The **hard deadline** for this quiz is **Wed 5 Jun 2013 8:59 PM PDT (UTC -0700)**.

To specify an array or sequence of values in an answer, you must separate the values by a single space character (with no punctuation and with no leading or trailing whitespace). For example, if the question asks for the first ten powers of two (starting at 1), the only accepted answer is:

1 2 4 8 16 32 64 128 256 512

If you wish to discuss a particular question and answer in the forums, please post the entire question and answer, including the seed (which is used by the course staff to uniquely identify the question) and the explanation (which contains the correct answer).

☐ In accordance with the Coursera Honor Code, I (Atul Gupta) certify that the answers here are my own work.

Question 1

(seed = 109225)

Compute the Huffman trie for the following string of length 48?

RZZIDHADZGIZZHDADHIIIRDGDHAIIZZDRDRIZZDGHRAIDRDR

For reference, here are the frequencies of each of the characters in the string:

char	freq
A	4
D	12
G	3
H	5
I	8
R	7
Z	9

Using the encodings from the Huffman trie you computed, how many bits are needed to encode the above string? Do not count the bits to represent the encoding table or any bits used for padding and byte alignment.

Question 2

(seed = 684709)

What is the result of expanding the following LZW-encoded sequence of 11 hexadecimal integers?

41 42 81 41 43 82 85 83 43 41 80

Assume the original encoding table consists of all 7-bit ASCII characters and uses 8-bit codewords. Give your answer as a sequence of characters, with one space between each character.

Question 3

(seed = 284494)

What is the result of compressing the following string of length 15 using LZW compression?

B B A A A C A A C C A B B B A

Assume the original encoding table consists of all 7-bit ASCII characters and uses 8-bit codewords. Give your answer as a sequence of 10 hexadecimal integers, starting with 42 and ending with the stop codeword 80.

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You cannot submit your work until you agree to the Honor Code. Thanks!