Data Compression

Back to Week 5

3/3 points earned (100%)

Quiz passed!

1 / 1 points

1.
(seed = 453695)

Compute the Huffman trie for the following string of length 65?

IFOOQJQQOJOYYJYJOFJOQQJFOJFOFFFEIFQQJIOJOOOJOOFOOIJFFQIOFOOOOYFFJ

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

```
char  freq
----------
   E     1
   F    14
   I     5
   J    12
   O    21
   Q     8
   Y     4
```

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.

163

Correct Response
The correct answer is: 163

Here is the encoding table that results from one Huffman trie:

```
char  freq  encoding  bits
-------------------------
   E     1     10110     5
   F    14        01    28
   I     5      1010    20
   J    12        00    24
   O    21        11    42
   Q     8       100    24
   Y     4     10111    20
-------------------------
                       163
```

Note: different Huffman tries result in different encoding tables, but they all result in 163 bits.

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1 / 1 points

```
(seed = 608030)
What is the result of expanding the following LZW-encoded sequence of 11 hexadecimal integers?

    41 41 43 42 41 84 84 83 86 42 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.
```

2.

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

Correct Response

```
The correct answer is: A A C B A B A B A C B B A B B


41 41 43 42 41 84    84    83    86       42 80
A  A  C  B  A  B  A  B  A  C  B  B  A  B  B

 i  codeword
------------
41    A
42    B
43    C
...
80    [end-of-file]
81    AA
82    AC
83    CB
84    BA
85    AB
86    BAB
87    BAC
88    CBB
89    BABB
```

---

1 / 1 points

```
(seed = 709661)
What is the result of compressing the following string of length 15 using LZW compression?

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

Assume the original encoding table consists of all 7-bit ASCII characters and uses 8-bit
codewords. Give your answer as a sequence of 12 hexadecimal integers, starting with 42
and ending with the stop codeword 80.
```

3.

42 43 43 41 84 43 42 81 41 42 85 80

Correct Response

```
The correct answer is: 42 43 43 41 84 43 42 81 41 42 85 80


B  C  C  A  A  A  C  B  B  C  A  B  A  A  C
42 43 43 41 84    43 42 81    41 42 85       80

 i  codeword
------------
41    A
42    B
43    C
...
80    [end-of-file]
81    BC
82    CC
83    CA
84    AA
85    AAC
86    CB
87    BB
88    BCA
89    AB
8A    BA
```