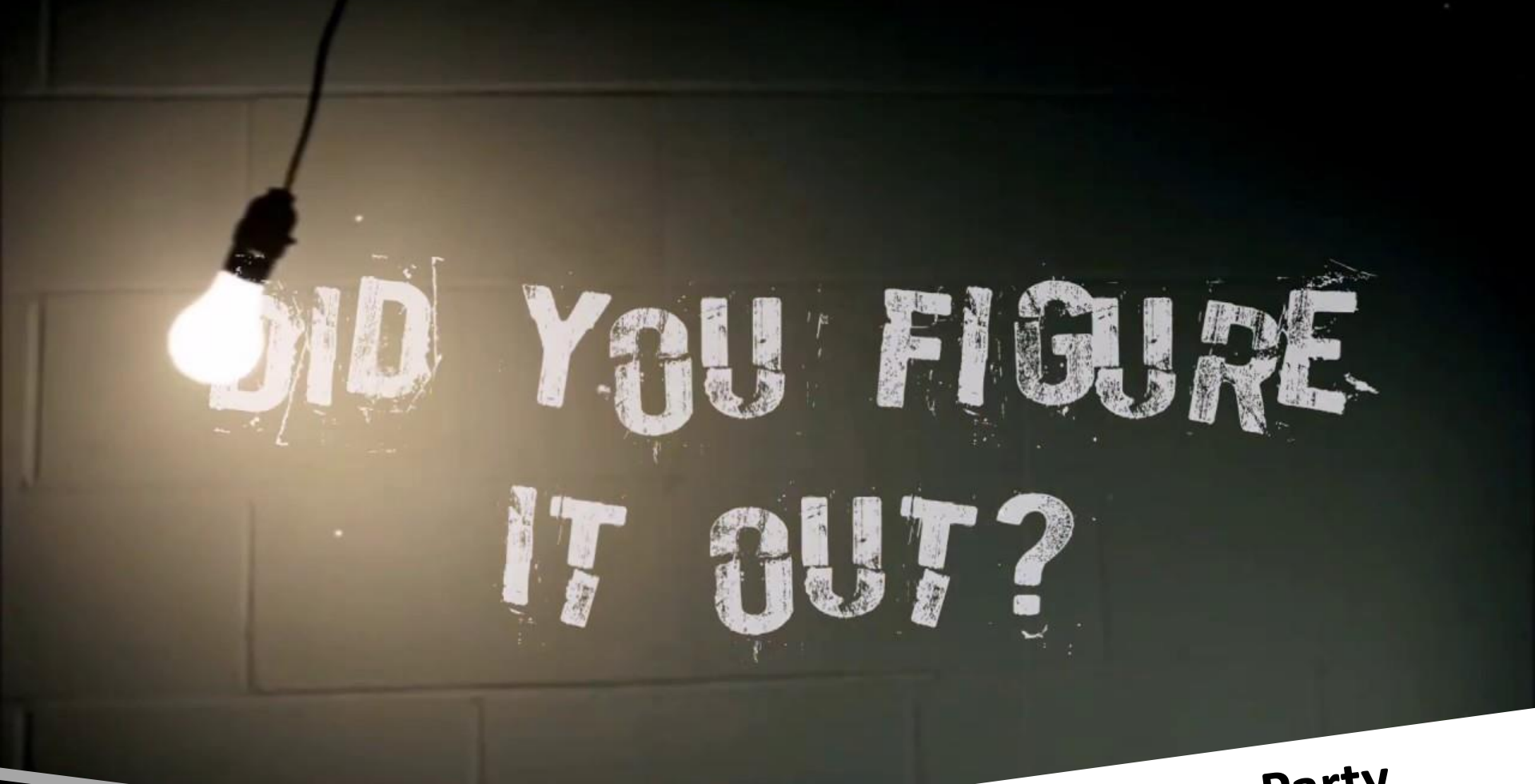

Christmas Party

Dec 27th, 2018

Algorithm Design and Analysis

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Problem 5

Textbook Chapter 16.3 – Huffman codes

Painting

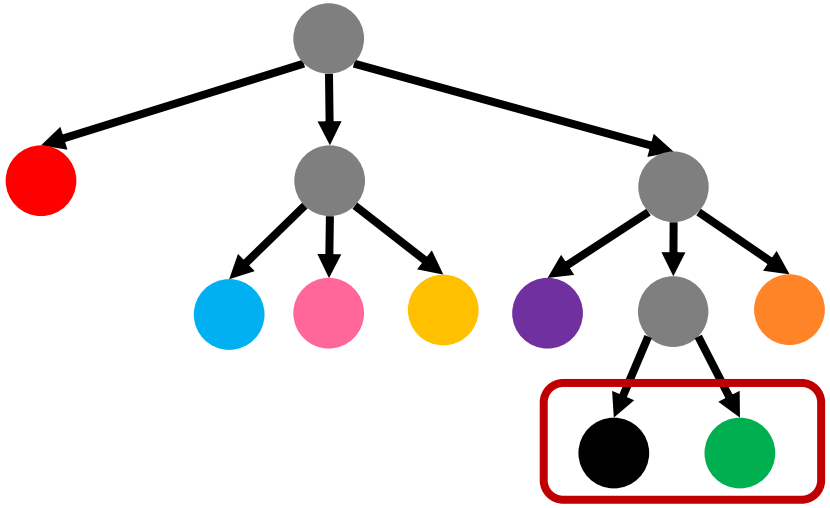
- Put stickers in a single row on each tube to indicate its color.
- There are k types of stickers.
- Tubes with the same color should have the same sticker pattern and should be prefix free.

Color	red	pink	orange	yellow	green	blue	purple	black
#Tubes	25	15	12	19	7	12	8	2

- Minimize the total number of stickers put on all tubes
- 3-ary prefix tree (each node can have at most k children).

3-arry Huffman Coding

Color	red	pink	orange	yellow	green	blue	purple	black
#Tubes	25	15	12	19	7	12	8	2



Why?

- The total length is $25 \cdot 1 + (12 + 15 + 19 + 8 + 12) \cdot 2 + (7 + 2) \cdot 3 = 184$

T/F Question

- Given a file containing a sequence of 8-bit characters (256 characters), if the maximum character frequency is less than *k* of the minimum character frequency in the file, then a *binary Human code* is always worse than or equal to an 8-bit fixed length code (in terms of the length of the encoded file).
- What is the minimal value of *k*?
  - https://stackoverflow.com/questions/8960698/huffman-coding-prove-on-a-8-bit-sequence

Christmas Party Exam!!