5/28 Tree & Boolean algebra

Decision tree
counterfeit - n item — n leaves. → $O(\log_3 n)$ ← lower bound of (what) problem ∴ implementation ↓ optimal alg. (how)

Sorting - n items. $\underline{a_1 \ldots a_n}$

$\underline{n!\ \text{leaves}}$ … $\{a_5 \le a_2 \ldots \le \ldots$ $O(\log_2 n!)$
$n!$ ‖ $O(n \log n)$ worst case!

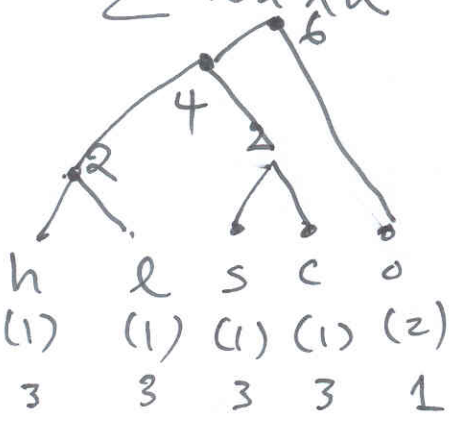
binary comparison

prefix code ⟷ full (regular) binary code

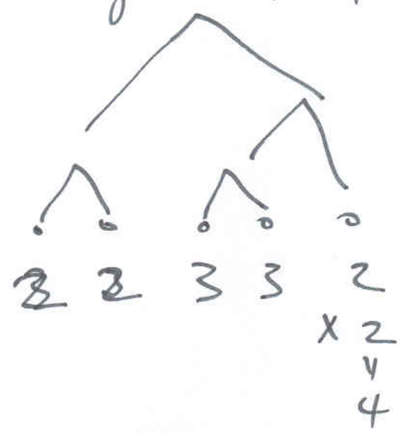
Hoffman coding V school
‖ $a \in V$, $W_a \in \mathbb{N}$ $l_a \in \mathbb{N}$
o 2 h 1
s 1 l 1
c 1

W_a ↓ occurence of a; l_a: length of a (# of bits)

minimise → $\sum W_a \cdot l_a$ ‥ total length (bit) of message



14 bit



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Universal address system

root : ε

subtree : x

infix, prefix, postfix

ambiguous — unambiguous, (# of operand) / stack

↳ precedence — diffnent oper.

associativity — same oper

- left
- right
- no. asso.

a+b*c

a+b+c

1+2+3+ ... +100

= @ + 1 2 3 100

$f(a_1, \cdots, a_n)$

$f\ a_1\ a_2 \cdots a_n$

] prefix