On input a valid chain *chain*, output the sequence of messages m contained in the fruit contained in blocks of *chain*, ordered by:

- the block (which contained the fruit, which contains the message)—that is, messages inside fruits inside earlier blocks, come earlier;
- in the case of ties (i.e., if some block contains multiple fruits), break ties by the pointer of the fruit (giving preference to fruit pointing to earlier blocks), and finally if have the same pointer, just lexicographically.[a]

[a] The method for how we break times among fruit in the *same* block is inconsequential for our results.