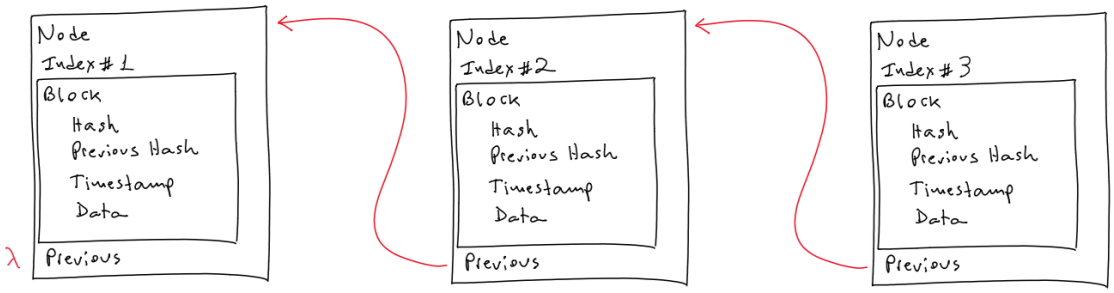
Problem 5: Blockchain

The problem was addressed considering a simple linked list (required in the problem statement) as the data structure to store the blockchain in memory with no persistency.

The algorithm input ***n*** will correspond to the blockchain height, considering the newest block at the top or list head end.



The program considers a class ***Blockchain*** which implements the linked list of ***Node*** class objects. Each node will carry a ***Block*** class object, besides a sequential index number and a pointer to the previous node created. Note that the previous hash field corresponds to a different field inside the block. Thus, a change in one of the blocks will make the chain inconsistent but not broken.

An ***add_block()*** method in ***Blockchain*** class allows including new blocks always at the head end with a time complexity is ***O(1)***. The space complexity will be ***O(n)*** since the algorithm needs one node per block in the chain.