Blockchain

Implementing the blockchain takes a linked list and a hash table. The linked list will maintain the order of the blocks with a pointer to the previous block. It also uses a dictionary that keeps track of the data-hash pair. This implementation makes the space complexity $O(n)$ and for the time complexity, it is done in constant time; Insertion in the list and the dictionary are both done in constant time. I came up with a problem when adding a new block of the same data; collisions occurred, meaning, there were identical hashes. To mitigate this, I used a simple approach of using salting, which was a random number appended to the end of the data, this prevented collisions in the dictionary with a negligible impact on performance.

Sources

Krzyzanowski, P. (2022, March 27). Blockchain and Bitcoin. From
https://people.cs.rutgers.edu/~pxk/419/notes/bitcoin.html