

# Lecture 06 - News, Stocks, Go

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## News

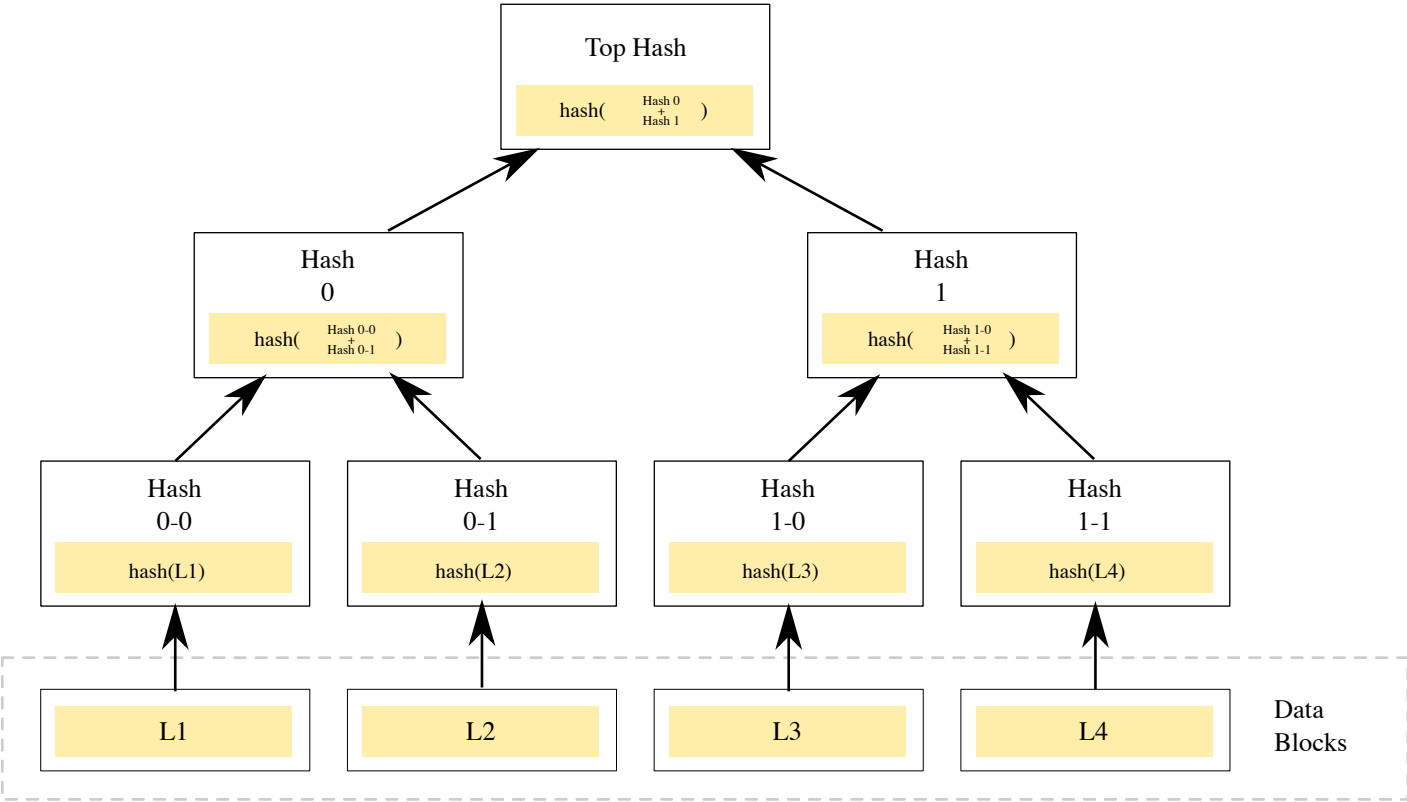
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## Merkle Trees

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### Pseudo Code

1. Create a slice to hold the hashes of the leaves. Each leaf hash is a `[]byte`. So make the data type `[][]byte`. Make this slice of slice of byte then length of the data. That would be `len(data)`. Let's call this `hTmp`.
2. For each data block
  1. Calculate a hash for the data block using `hash.Hash0f()`.
  2. Save this in the slice created in (1) above.
3. Create a `[][]byte` slice to hold the intermediate hashes in the tree. This will need to be no more than `len(data)/2+1` in length. The plus 1 is so that 0 blocks of hashing or an odd number of blocks will have enough space. Let's call this `hMid`.
4. Declare a variable `ln`, and set it to `len(data)/2+1`
5. While `ln >= 1` (Hint: the language only has `for` loops with lots of different ways of doing it)
  1. For each pair of hashes (if you have an odd number just use the single hash)
    - Calculate the hash of the pair using `hash.Keccak256()`. It takes a variable number of arguments so you can pass 1 or 2 arguments to it.
    - Append this to `hMid`.
  2. Replace `hTmp` with `hMid`
  3. Recalculate `ln` set it to `len(hTmp)/2`
  4. Generate a new empty `hMid` of allocated space of `len(hTmp)/2`.
6. Return `hTmp[0]`



Block Data	Hash
L1	21
L2	8
L3	10
L4	40
21+8	5
10+40	72
5+72	14

## Stock Stuff

What is a Stock?

What is a Dividend?

SEC Reg(D)?

SEC Enforcement of Securities Laws.

Wyoming Laws on Stocks.

What is a NFT - and is it a security?

What is a Bond? What is a Fixed Coupon v.s. a Variable Capon?

What is Yield?

How are dividends payed?

Other Investments (Gold, Diamonds, Houses, Apartments)