

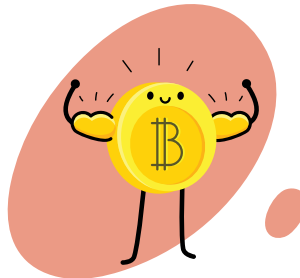
THE BITCOIN HALVING

part 2: see for yourself!

you can observe block subsidies by
using bitcoin-cli to query your node

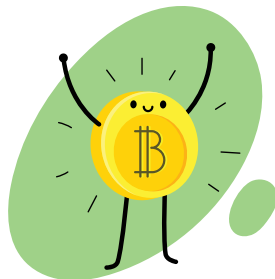
part 2 will walk through some exercises

if you don't have access to a full-node,
you can use a block explorer to access
this information



by amiti

the toolbox



we're going to communicate with our node's
RPC interface using bitcoin-cli

let's learn some relevant commands
to answer our questions!

how long is the current chain?

`getblockcount`

this is also known as block height

what is the current subsidy?

`getblockstats BLOCKHEIGHT`

this command returns lots of
information about a block.

look for the one labeled

`"subsidy"`

(shown in satoshis)

whats the blockhash of the most
recent block?

`getbestblockhash`

a closer look

`getblockstats` is an interesting command,
so lets inspect it more carefully.

there are two ways to invoke it:

`getblockstats BLOCKHEIGHT`

OR

`getblockstats BLOCKHASH`

but be warned! if you pass in a blockhash,
you need the following syntax:

``"BLOCKHASH"'`

your turn !

here are some ideas of questions you
can explore

did the subsidy change
at block 210,000?

was the subsidy actually 50
BTC in the very first block?

has there ever been an
unexpected subsidy?

digging deeper

next up, lets inspect the transaction where the new bitcoin have been generated

for this, we will need two more commands:

takes: blockhash

returns: information about a block
such as its weight, difficulty, and
included transactions

getblock

takes: txid boolean* blockhash**

returns***: information about a transaction
such as its size, inputs & outputs

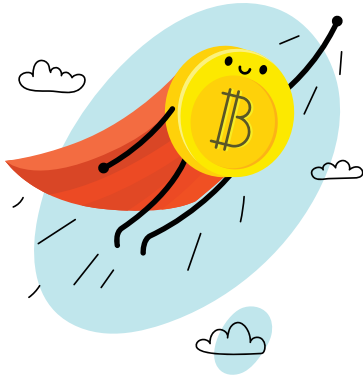
getrawtransaction

* passing true gives us verbose results,
aka can be understood by humans

** this part is unnecessary if you have
txindex enabled

*** if the transaction has been spent, you'll
need txindex enabled to retrieve it

great! let's go!



1. get the blockhash of the chain tip

```
bitcoin-cli getbestblockhash  
-> 0000000000000000000000000000000000000000000000000000000000000000
```

2. find the hash of the coinbase transaction

```
bitcoin-cli getblock [BLOCKHASH]  
{  
  "tx": [  
    "b690854fad...",  
    "cc4d31d24f...",  
    "79bc0f9acb...",  
    [...]  
  ]  
}
```

the coinbase
transaction is always
the first one in the
block

if you're looking for the blockhash
of a different block, try

getblockhash BLOCKHEIGHT

3. PROFIT! some bitcoin for the miners & some learning for us

```
bitcoin-cli getrawtransaction [COINBASE-TXID] true [BLOCKHASH]
{
  [...]
  "vin": [
    {
      "coinbase": "03bf97092c.."
      "sequence": 0
    }
  ],
  "vout": [
    {
      "value": 13.08815547,
      "n": 0,
      "scriptPubKey": [...],
    }
  ],
}
```

these are the **inputs**
they usually point to bitcoin being spent, but here **coinbase** indicates these are **new** bitcoin

these are the **outputs**
the miner provides an address where the newly minted bitcoin get deposited

but hold on...

how can the number of bitcoin
created be > 12.5?

WHAT IS GOING ON HERE?!

block rewards

for each block, the miner is rewarded the
block subsidy + transaction fees

as the subsidy reduces, bitcoin users can incentivize mining blocks
via transaction fees

you can use the information from `getblockstats` to check

outputs <= subsidy + fees

(your node is always doing this for you!)



YOU DID IT !

thanks for playing!

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