

# Work on project. Stage 6/6: Local currency

23 users solved this problem. Latest completion was about 14 hours ago.

Project: [Blockchain](#)

 Hard  9 minutes 

## §1. Description

Today, the most common application of blockchains is cryptocurrencies. A cryptocurrency's blockchain contains a list of transactions: everyone can see the transactions but no one is able to change them. In addition, no one can send a transaction as another person; this is possible using digital signatures. You have actually implemented all of this functionality in the previous stages.

A miner who creates a new block should be awarded some virtual money, for example, 100 virtual coins. This can be remembered in the blockchain if the block stores information about the miner who created this block. Of course, this message also should be proved, so the miner adds this information to the blockchain before starting a search for a magic number.

After that, a miner can spend these 100 virtual coins by giving them to someone else. In the real world, he can buy things and pay for them using these virtual coins instead of real money. These virtual coins go to the company that sells the things, and the company can pay salaries with these virtual coins. The circulation of these coins starts here and suddenly the virtual coins become more popular than real money!

To check how many coins a person has, you need to check all of his transactions and all of the transactions to him, assuming that the person started with zero virtual coins. The transaction should be rejected when the person tries to spend more money than he has at the moment. Create a special method that returns how many coins the person has.

In this stage, you need to implement transactions like this instead of text messages like in the previous stage. For testing reasons you can assume that everyone starts with 100 virtual coins, not 0. But as described above, all the money of the blockchain is initially awards for creating blocks of the blockchain.

## §2. Output example

In the output example, VC stands for Virtual Coins. To be tested successfully, program should output information about first **fifteen** blocks of the blockchain. Blocks should be separated by an empty line.

Block:  
Created by: miner9  
miner9 gets 100 VC  
Id: 1  
Timestamp: 1539866031047  
Magic number: 76384756  
Hash of the previous block:  
0  
Hash of the block:  
1d12cbbb5bfa278734285d261051f5484807120032cf6adcca5b9a3dbf0e7bb3  
Block data:  
No transactions  
Block was generating for 0 seconds  
N was increased to 1

Block:  
Created by: miner7  
miner7 gets 100 VC  
Id: 2  
Timestamp: 1539866031062  
Magic number: 92347234  
Hash of the previous block:  
1d12cbbb5bfa278734285d261051f5484807120032cf6adcca5b9a3dbf0e7bb3  
Hash of the block:  
04a6735424357bf9af5a1467f8335e9427af714c0fb138595226d53beca5a05e  
Block data:  
miner9 sent 30 VC to miner1  
miner9 sent 30 VC to miner2  
miner9 sent 30 VC to Nick  
Block was generating for 0 seconds  
N was increased to 2

Block:  
Created by: miner1  
miner1 gets 100 VC  
Id: 3  
Timestamp: 1539866031063  
Magic number: 42374628  
Hash of the previous block:  
04a6735424357bf9af5a1467f8335e9427af714c0fb138595226d53beca5a05e  
Hash of the block:  
0061924d48d5ce30e97cfc4297f3a40bc94dfac6af42d7bf366d236007c0b9d3  
Block data:  
miner9 sent 10 VC to Bob  
miner7 sent 10 VC to Alice  
Nick sent 1 VC to ShoesShop  
Nick sent 2 VC to FastFood  
Nick sent 15 VC to CarShop  
miner7 sent 90 VC to CarShop  
Block was generating for 0 seconds  
N was increased to 3

Block:  
Created by miner2  
miner2 gets 100 VC  
Id: 4  
Timestamp: 1539866256729  
Magic number: 45382978  
Hash of the previous block:  
0061924d48d5ce30e97cfc4297f3a40bc94dfac6af42d7bf366d236007c0b9d3  
Hash of the block:  
000856a20d767fbbc38e0569354400c1750381100984a09a5d8b1cdf09b0bab6  
Block data:  
CarShop sent 10 VC to Worker1  
CarShop sent 10 VC to Worker2  
CarShop sent 10 VC to Worker3  
CarShop sent 30 VC to Director1  
CarShop sent 45 VC to CarPartsShop  
Bob sent 5 VC to GamingShop  
Alice sent 5 VC to BeautyShop  
Block was generating for 5 seconds

N was increased to 4

... (another 10 blocks, so the output contains 15 blocks)

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✓ **IDE is responding** IntelliJ IDEA 2019.3

✓ **Plugin is responding** 3.2-2019.3-3686

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