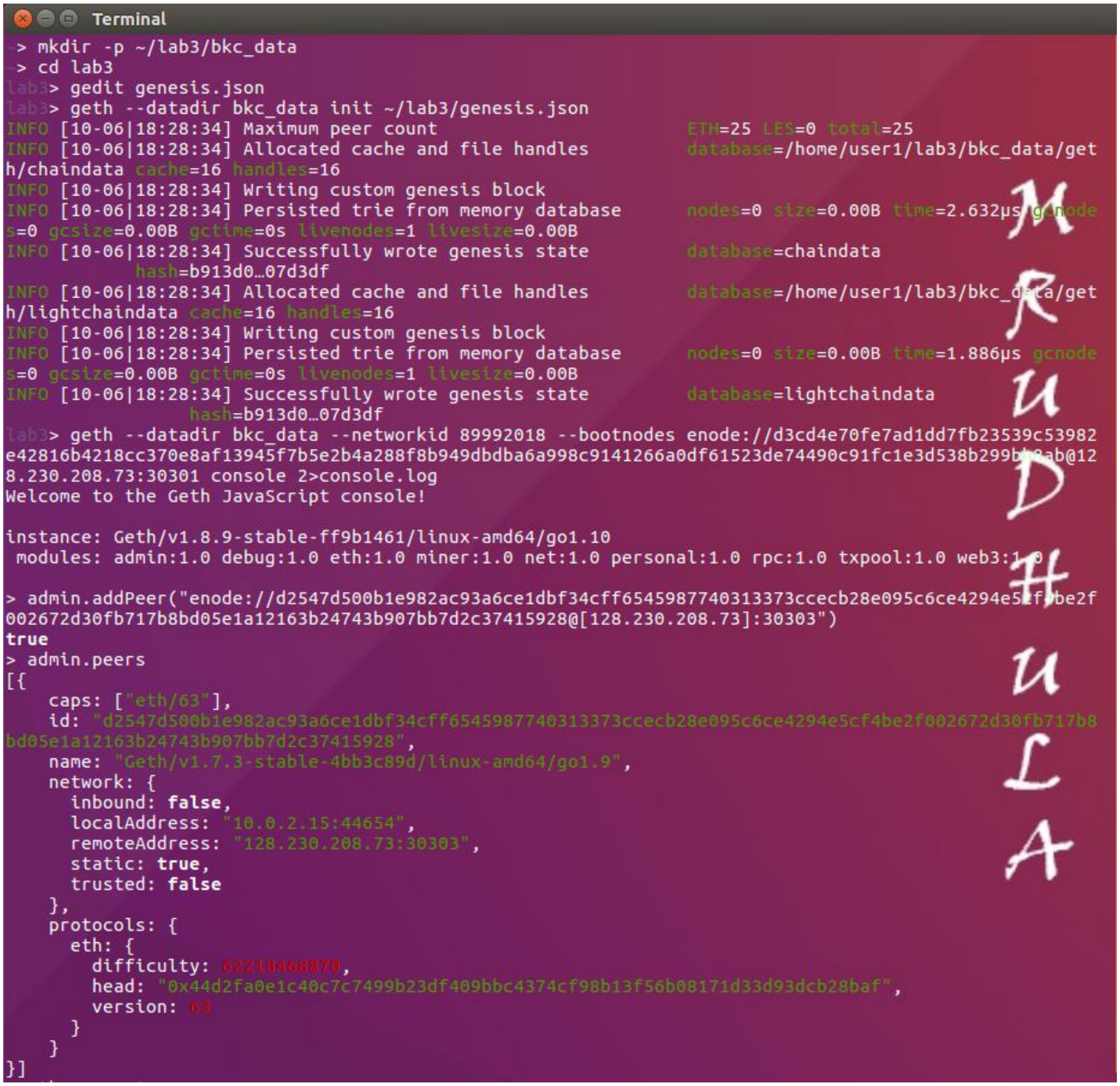
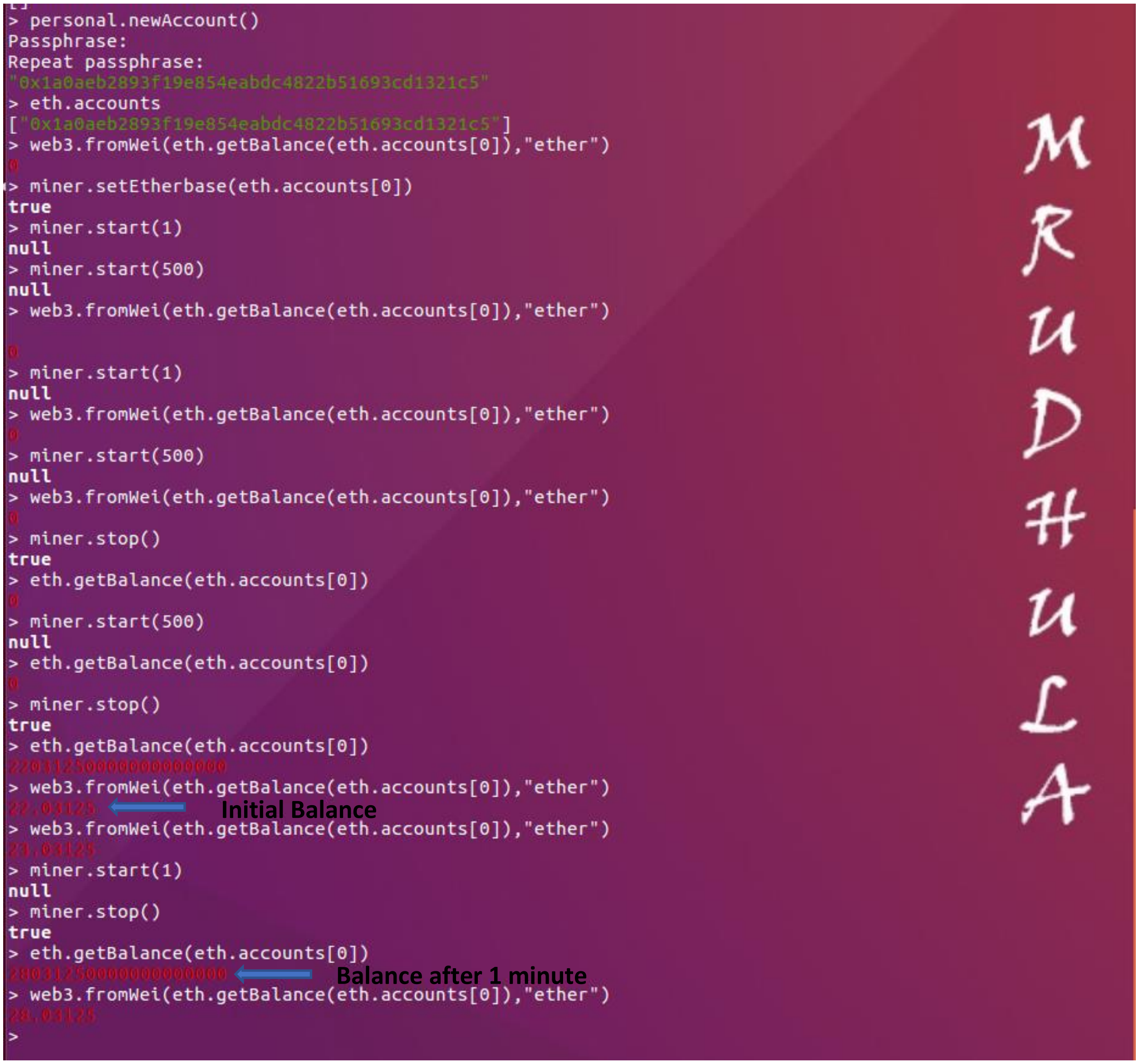
BLOCKCHAIN STORAGE AND MINING ON CAMPUS

INITIAL SETUP



```
-> mkdir -p ~/lab3/bkc_data
-> cd lab3
lab3> gedit genesis.json
lab3> geth --datadir bkc_data init ~/lab3/genesis.json
INFO [10-06|18:28:34] Maximum peer count                       ETH=25 LES=0 total=25
INFO [10-06|18:28:34] Allocated cache and file handles         database=/home/user1/lab3/bkc_data/get
h/chaindata cache=16 handles=16
INFO [10-06|18:28:34] Writing custom genesis block
INFO [10-06|18:28:34] Persisted trie from memory database      nodes=0 size=0.00B time=2.632µs gcnode
s=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [10-06|18:28:34] Successfully wrote genesis state         database=chaindata
            hash=b913d0…07d3df
INFO [10-06|18:28:34] Allocated cache and file handles         database=/home/user1/lab3/bkc_data/get
h/lightchaindata cache=16 handles=16
INFO [10-06|18:28:34] Writing custom genesis block
INFO [10-06|18:28:34] Persisted trie from memory database      nodes=0 size=0.00B time=1.886µs gcnode
s=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [10-06|18:28:34] Successfully wrote genesis state         database=lightchaindata
                 hash=b913d0…07d3df
lab3> geth --datadir bkc_data --networkid 89992018 --bootnodes enode://d3cd4e70fe7ad1dd7fb23539c53982
e42816b4218cc370e8af13945f7b5e2b4a288f8b949dbdba6a998c9141266a0df61523de74490c91fc1e3d538b299b[illegible]ab@12
8.230.208.73:30301 console 2>console.log
Welcome to the Geth JavaScript console!

instance: Geth/v1.8.9-stable-ff9b1461/linux-amd64/go1.10
 modules: admin:1.0 debug:1.0 eth:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0 txpool:1.0 web3:1.0

> admin.addPeer("enode://d2547d500b1e982ac93a6ce1dbf34cff6545987740313373ccecb28e095c6ce4294e5cf4be2f
002672d30fb717b8bd05e1a12163b24743b907bb7d2c37415928@[128.230.208.73]:30303")
true
> admin.peers
[{
    caps: ["eth/63"],
    id: "d2547d500b1e982ac93a6ce1dbf34cff6545987740313373ccecb28e095c6ce4294e5cf4be2f002672d30fb717b8
bd05e1a12163b24743b907bb7d2c37415928",
    name: "Geth/v1.7.3-stable-4bb3c89d/linux-amd64/go1.9",
    network: {
      inbound: false,
      localAddress: "10.0.2.15:44654",
      remoteAddress: "128.230.208.73:30303",
      static: true,
      trusted: false
    },
    protocols: {
      eth: {
        difficulty: 62218468870,
        head: "0x44d2fa0e1c40c7c7499b23df409bbc4374cf98b13f56b08171d33d93dcb28baf",
        version: 63
      }
    }
}]
```

TASK 1:



```
> personal.newAccount()
Passphrase:
Repeat passphrase:
"0x1a0aeb2893f19e854eabdc4822b51693cd1321c5"
> eth.accounts
["0x1a0aeb2893f19e854eabdc4822b51693cd1321c5"]
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
0
> miner.setEtherbase(eth.accounts[0])
true
> miner.start(1)
null
> miner.start(500)
null
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")

0
> miner.start(1)
null
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
0
> miner.start(500)
null
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
0
> miner.stop()
true
> eth.getBalance(eth.accounts[0])
0
> miner.start(500)
null
> eth.getBalance(eth.accounts[0])
0
> miner.stop()
true
> eth.getBalance(eth.accounts[0])
22031250000000000000
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
22.03125
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
23.03125
> miner.start(1)
null
> miner.stop()
true
> eth.getBalance(eth.accounts[0])
28031250000000000000
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
28.03125
>
```

Initial Balance

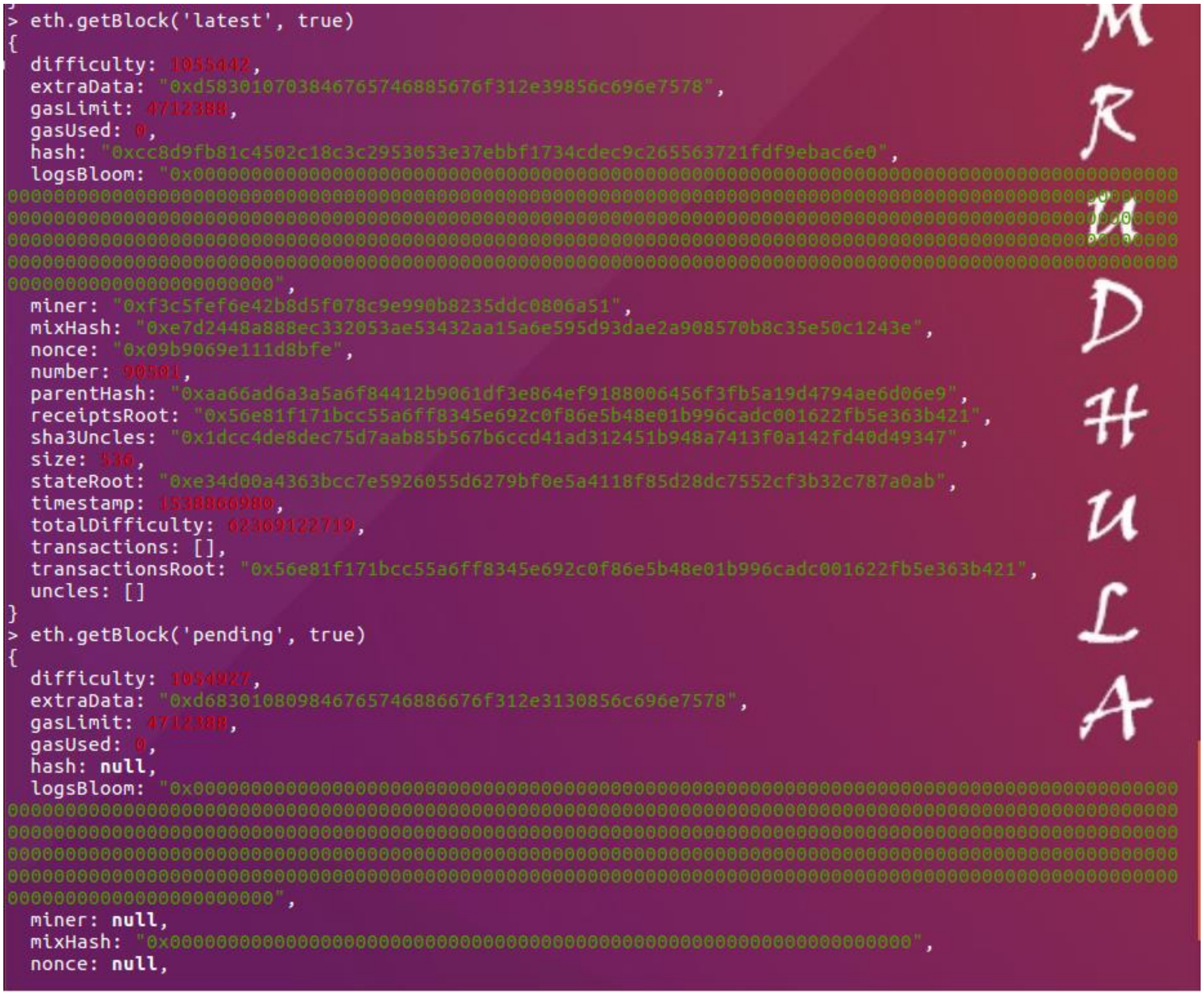
Balance after 1 minute

In this task we start mining, hence we use command *miner.start(1)* where 1 indicates one thread we can increase number of threads to increase the power of mining. I tried mining with different number of threads initially when I checked my balance was 0. After some time I had 22 ethers and then I waited for another 1 minute and saw I had 28 ethers as shown in the above screenshot.

Commands Used:

miner.start(1)
eth.getBalance(eth.accounts[0])
web3.fromWei(eth.getBalace(eth.accounts[0]),"ether")
miner.stop()

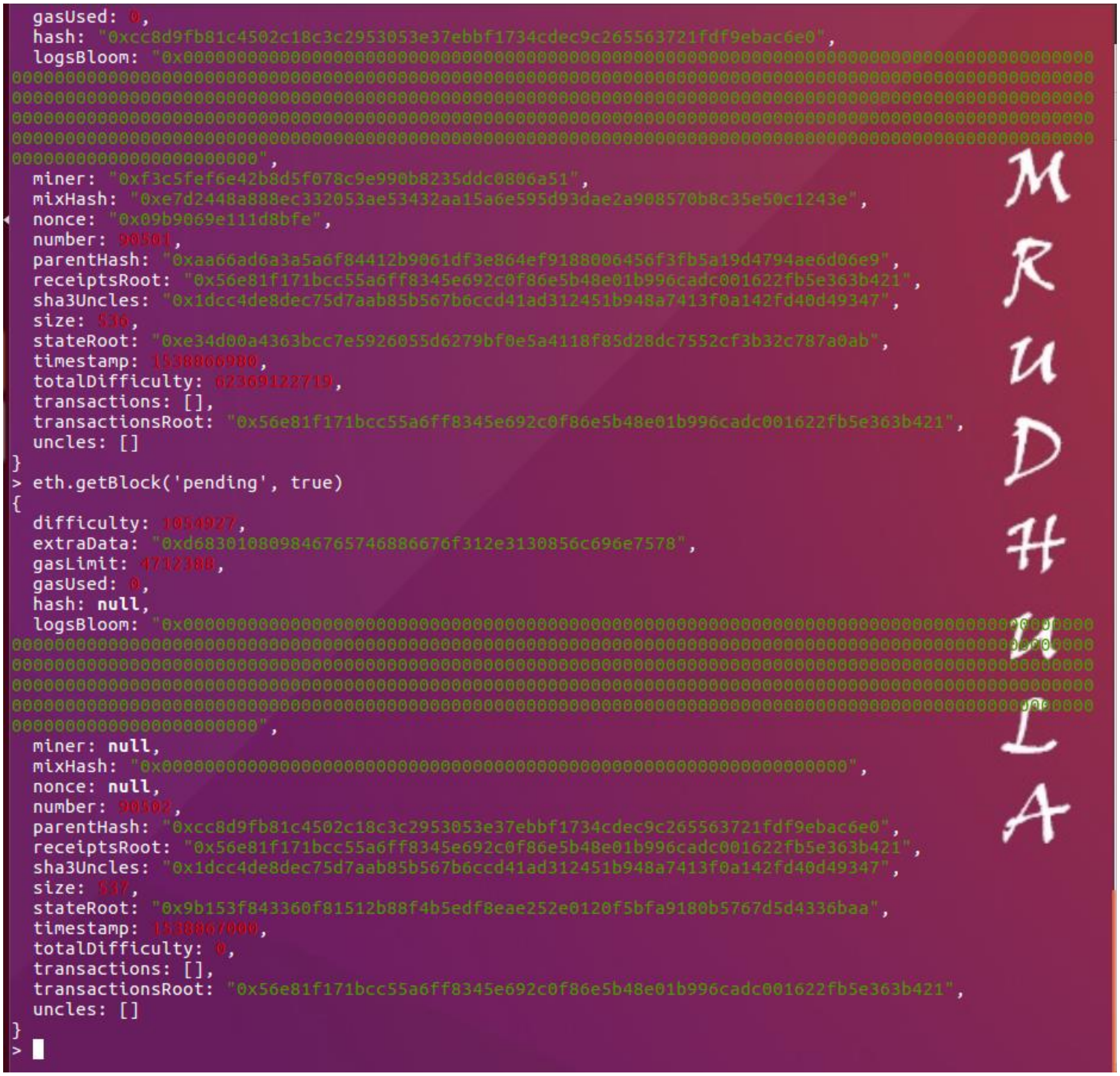
TASK 2:



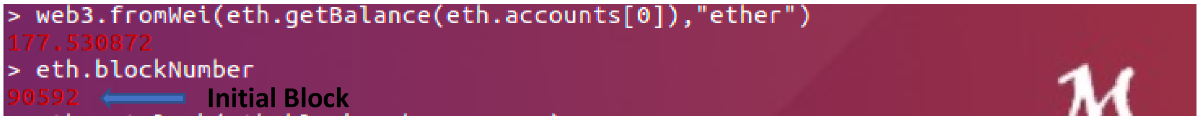
```
> eth.getBlock('latest', true)
{
  difficulty: 1055442,
  extraData: "0xd583010703846765746885676f312e39856c696e7578",
  gasLimit: 4712388,
  gasUsed: 0,
  hash: "0xcc8d9fb81c4502c18c3c2953053e37ebbf1734cdec9c265563721fdf9ebac6e0",
  logsBloom: "0x0000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000",
  miner: "0xf3c5fef6e42b8d5f078c9e990b8235ddc0806a51",
  mixHash: "0xe7d2448a888ec332053ae53432aa15a6e595d93dae2a908570b8c35e50c1243e",
  nonce: "0x09b9069e111d8bfe",
  number: 90501,
  parentHash: "0xaa66ad6a3a5a6f84412b9061df3e864ef9188006456f3fb5a19d4794ae6d06e9",
  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 536,
  stateRoot: "0xe34d00a4363bcc7e5926055d6279bf0e5a4118f85d28dc7552cf3b32c787a0ab",
  timestamp: 1538866980,
  totalDifficulty: 62369122719,
  transactions: [],
  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  uncles: []
}
> eth.getBlock('pending', true)
{
  difficulty: 1054927,
  extraData: "0xd683010809846765746886676f312e3130856c696e7578",
  gasLimit: 4712388,
  gasUsed: 0,
  hash: null,
  logsBloom: "0x0000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000",
  miner: null,
  mixHash: "0x0000000000000000000000000000000000000000000000000000000000000000",
  nonce: null,
```

Commands Used:

eth.getBlock(‘ latest’ ,true)
eth.getBlock(‘pending’,true)

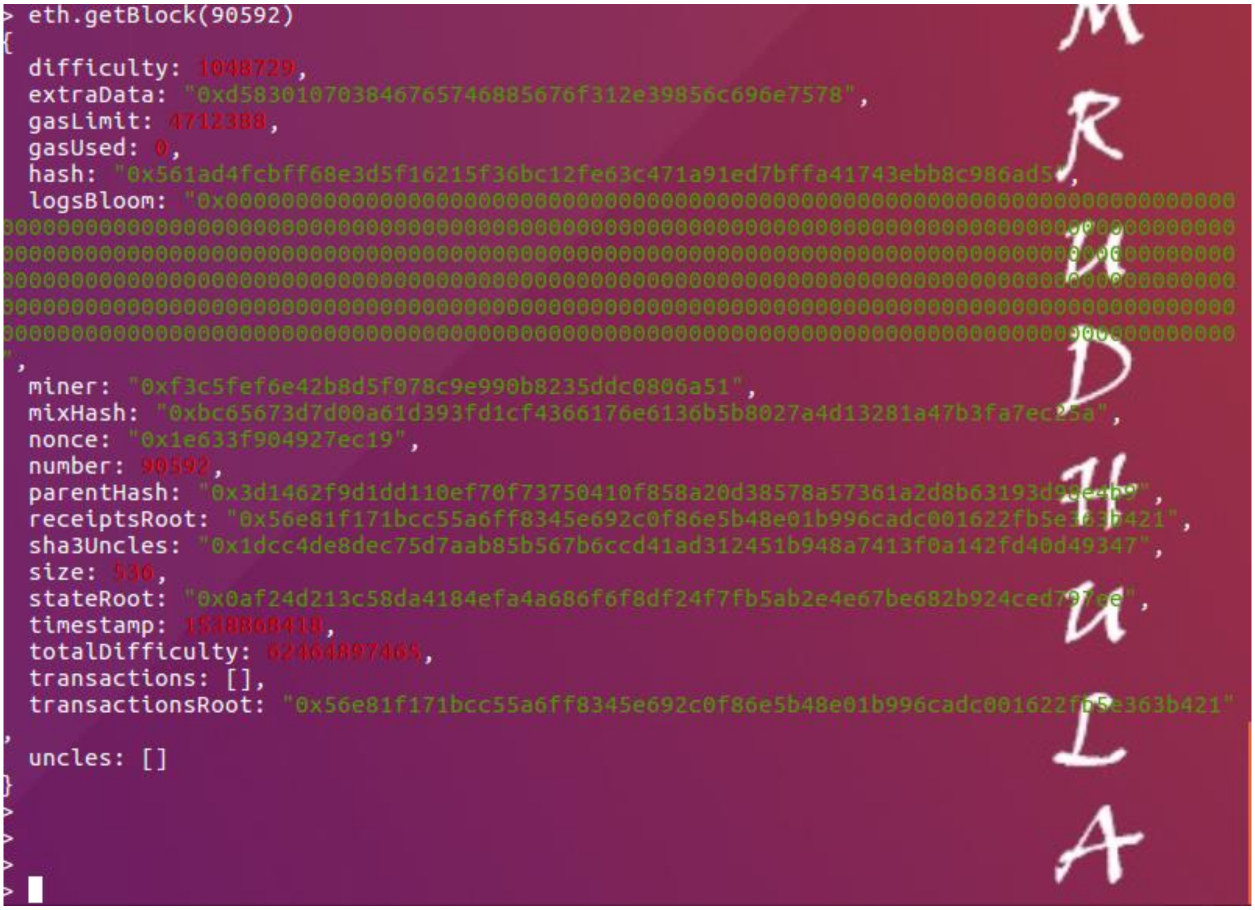


```
  gasUsed: 0,
  hash: "0xcc8d9fb81c4502c18c3c2953053e37ebbf1734cdec9c265563721fdf9ebac6e0",
  logsBloom: "0x0000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000",
  miner: "0xf3c5fef6e42b8d5f078c9e990b8235ddc0806a51",
  mixHash: "0xe7d2448a888ec332053ae53432aa15a6e595d93dae2a908570b8c35e50c1243e",
  nonce: "0x09b9069e111d8bfe",
  number: 90501,
  parentHash: "0xaa66ad6a3a5a6f84412b9061df3e864ef9188006456f3fb5a19d4794ae6d06e9",
  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 536,
  stateRoot: "0xe34d00a4363bcc7e5926055d6279bf0e5a4118f85d28dc7552cf3b32c787a0ab",
  timestamp: 1538866980,
  totalDifficulty: 62369122719,
  transactions: [],
  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  uncles: []
}
> eth.getBlock('pending', true)
{
  difficulty: 1054927,
  extraData: "0xd683010809846765746886676f312e3130856c696e7578",
  gasLimit: 4712388,
  gasUsed: 0,
  hash: null,
  logsBloom: "0x0000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000",
  miner: null,
  mixHash: "0x0000000000000000000000000000000000000000000000000000000000000000",
  nonce: null,
  number: 90502,
  parentHash: "0xcc8d9fb81c4502c18c3c2953053e37ebbf1734cdec9c265563721fdf9ebac6e0",
  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 537,
  stateRoot: "0x9b153f843360f81512b88f4b5edf8eae252e0120f5bfa9180b5767d5d4336baa",
  timestamp: 1538867000,
  totalDifficulty: 0,
  transactions: [],
  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  uncles: []
}
> 
```

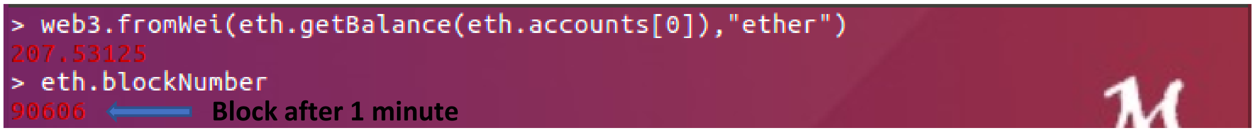


```
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
177.530872
> eth.blockNumber
90592
```

Initial Block

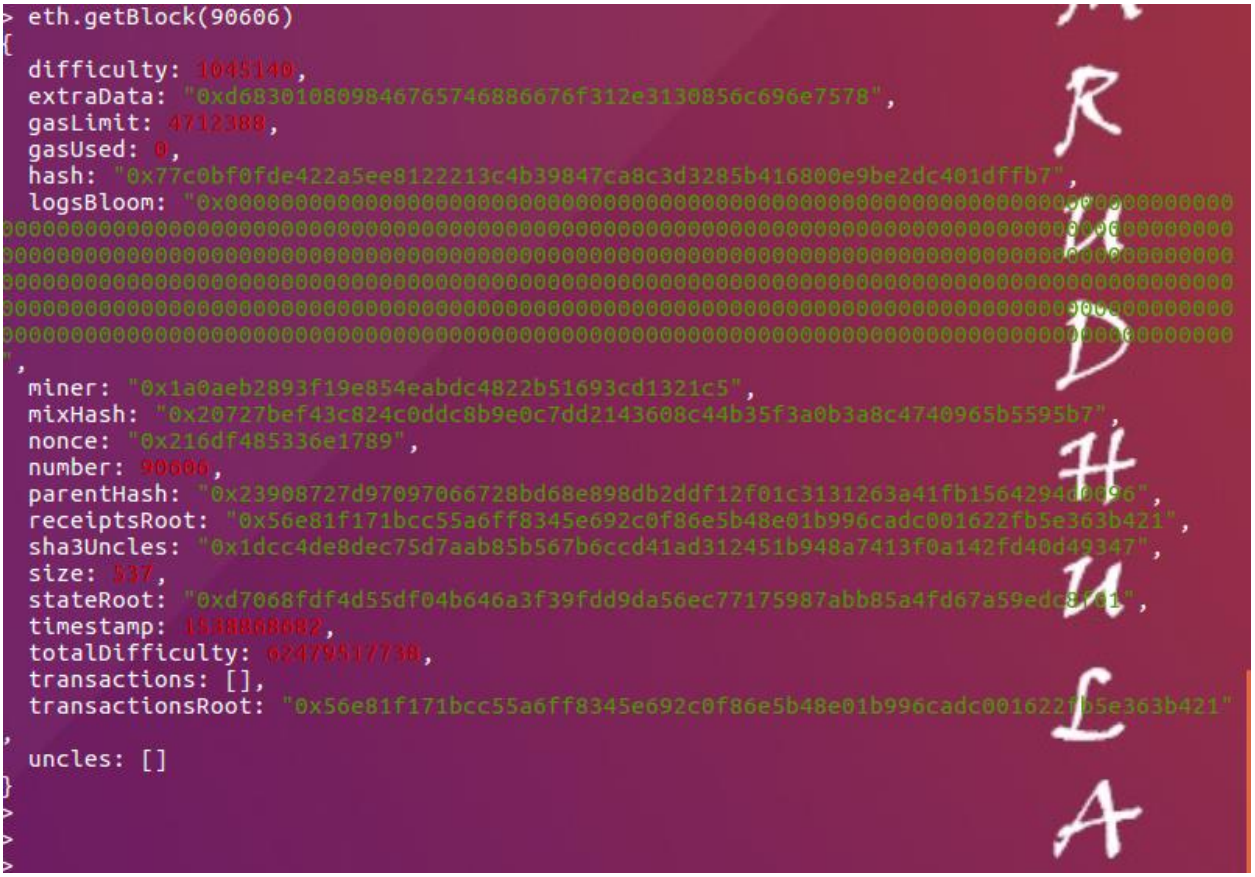


```
> eth.getBlock(90592)
{
  difficulty: 1048729,
  extraData: "0xd583010703846765746885676f312e39856c696e7578",
  gasLimit: 4712388,
  gasUsed: 0,
  hash: "0x561ad4fcbff68e3d5f16215f36bc12fe63c471a91ed7bffa41743ebb8c986ad5",
  logsBloom: "0x000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
",
  miner: "0xf3c5fef6e42b8d5f078c9e990b8235ddc0806a51",
  mixHash: "0xbc65673d7d00a61d393fd1cf4366176e6136b5b8027a4d13281a47b3fa7ec25a",
  nonce: "0x1e633f904927ec19",
  number: 90592,
  parentHash: "0x3d1462f9d1dd110ef70f73750410f858a20d38578a57361a2d8b63193d90e4b9",
  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 536,
  stateRoot: "0x0af24d213c58da4184efa4a686f6f8df24f7fb5ab2e4e67be682b924ced797ee",
  timestamp: 1538868418,
  totalDifficulty: 62464897465,
  transactions: [],
  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421"
,
  uncles: []
}
>
>
>
> 
```

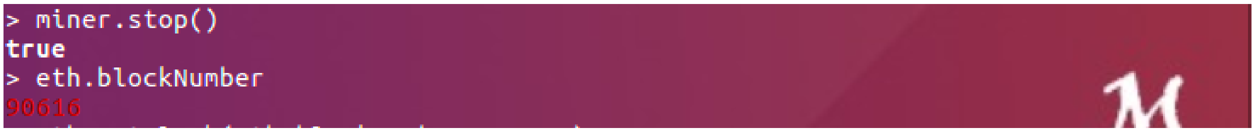


```
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
207.53125
> eth.blockNumber
90606
```

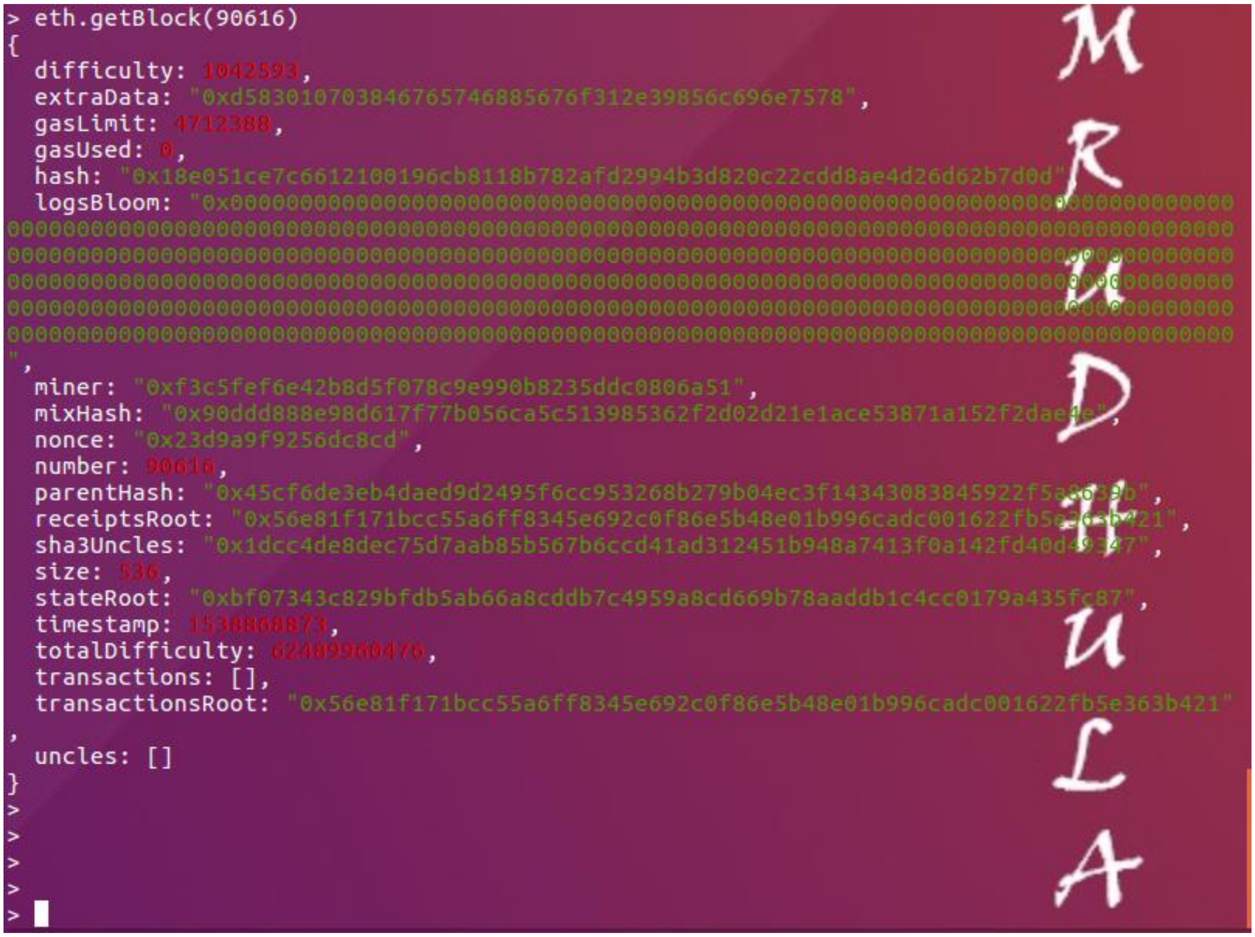
Block after 1 minute



```
> eth.getBlock(90606)
{
  difficulty: 1045140,
  extraData: "0xd683010809846765746886676f312e3130856c696e7578",
  gasLimit: 4712388,
  gasUsed: 0,
  hash: "0x77c0bf0fde422a5ee8122213c4b39847ca8c3d3285b416800e9be2dc401dffb7",
  logsBloom: "0x000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
",
  miner: "0x1a0aeb2893f19e854eabdc4822b51693cd1321c5",
  mixHash: "0x20727bef43c824c0ddc8b9e0c7dd2143608c44b35f3a0b3a8c4740965b5595b7",
  nonce: "0x216df485336e1789",
  number: 90606,
  parentHash: "0x23908727d97097066728bd68e898db2ddf12f01c3131263a41fb1564294d0096",
  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 537,
  stateRoot: "0xd7068fdf4d55df04b646a3f39fdd9da56ec77175987abb85a4fd67a59edc8f01",
  timestamp: 1538868682,
  totalDifficulty: 62479517738,
  transactions: [],
  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421"
,
  uncles: []
}
>
>
>
```



```
> miner.stop()
true
> eth.blockNumber
90616
```



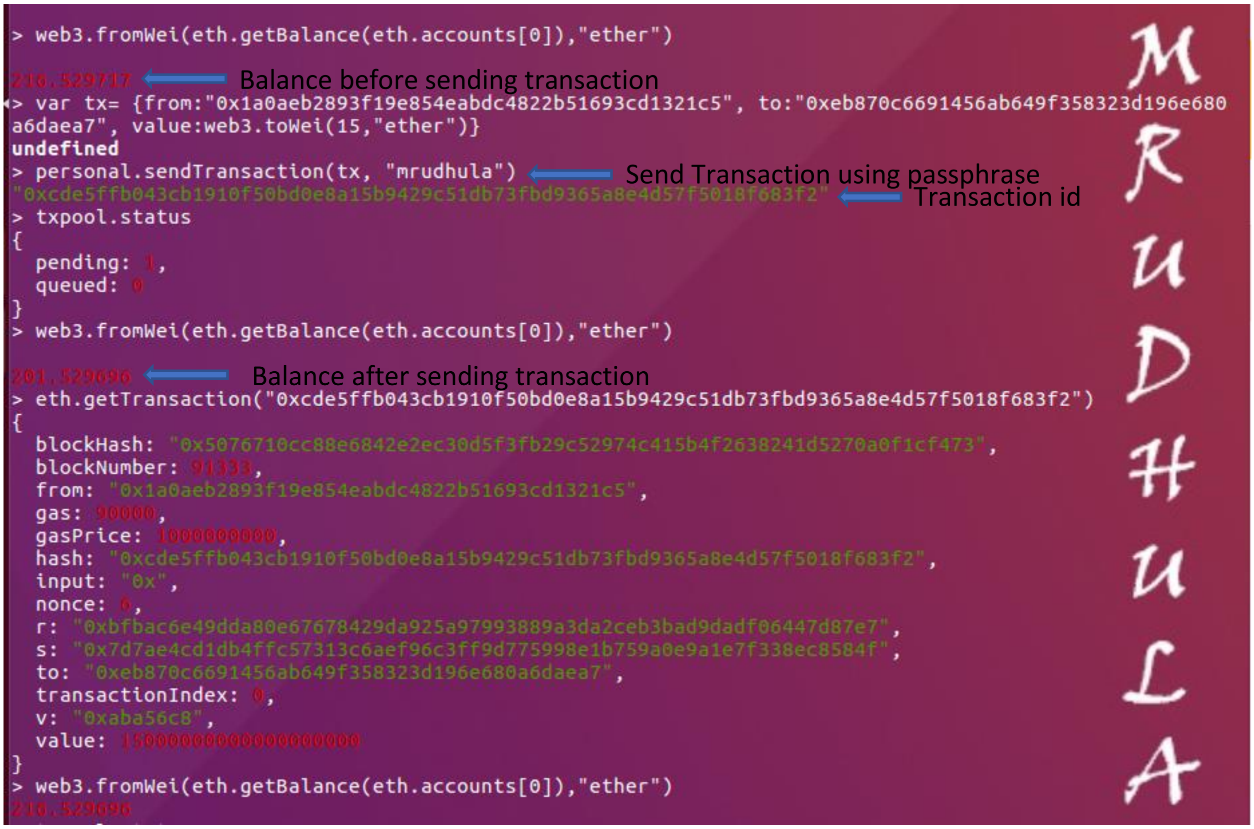
```
> eth.getBlock(90616)
{
  difficulty: 1042593,
  extraData: "0xd583010703846765746885676f312e39856c696e7578",
  gasLimit: 4712388,
  gasUsed: 0,
  hash: "0x18e051ce7c6612100196cb8118b782afd2994b3d820c22cdd8ae4d26d62b7d0d",
  logsBloom: "0x000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
",
  miner: "0xf3c5fef6e42b8d5f078c9e990b8235ddc0806a51",
  mixHash: "0x90ddd888e98d617f77b056ca5c513985362f2d02d21e1ace53871a152f2dae4e",
  nonce: "0x23d9a9f9256dc8cd",
  number: 90616,
  parentHash: "0x45cf6de3eb4daed9d2495f6cc953268b279b04ec3f14343083845922f5a8639b",
  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 536,
  stateRoot: "0xbf07343c829bfdb5ab66a8cddb7c4959a8cd669b78aaddb1c4cc0179a435fc87",
  timestamp: 1538868873,
  totalDifficulty: 62489960476,
  transactions: [],
  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421"
,
  uncles: []
}
>
>
>
>
> 
```

In this task, we notice that while mining when we get a block value and detail is not the same all the time. The block number keeps changing every time whether we are mining, while mining and when mining is stopped.

Commands Used:

eth.blockNumber
eth.getBlock(eth.blockNumber)

TASK 3:



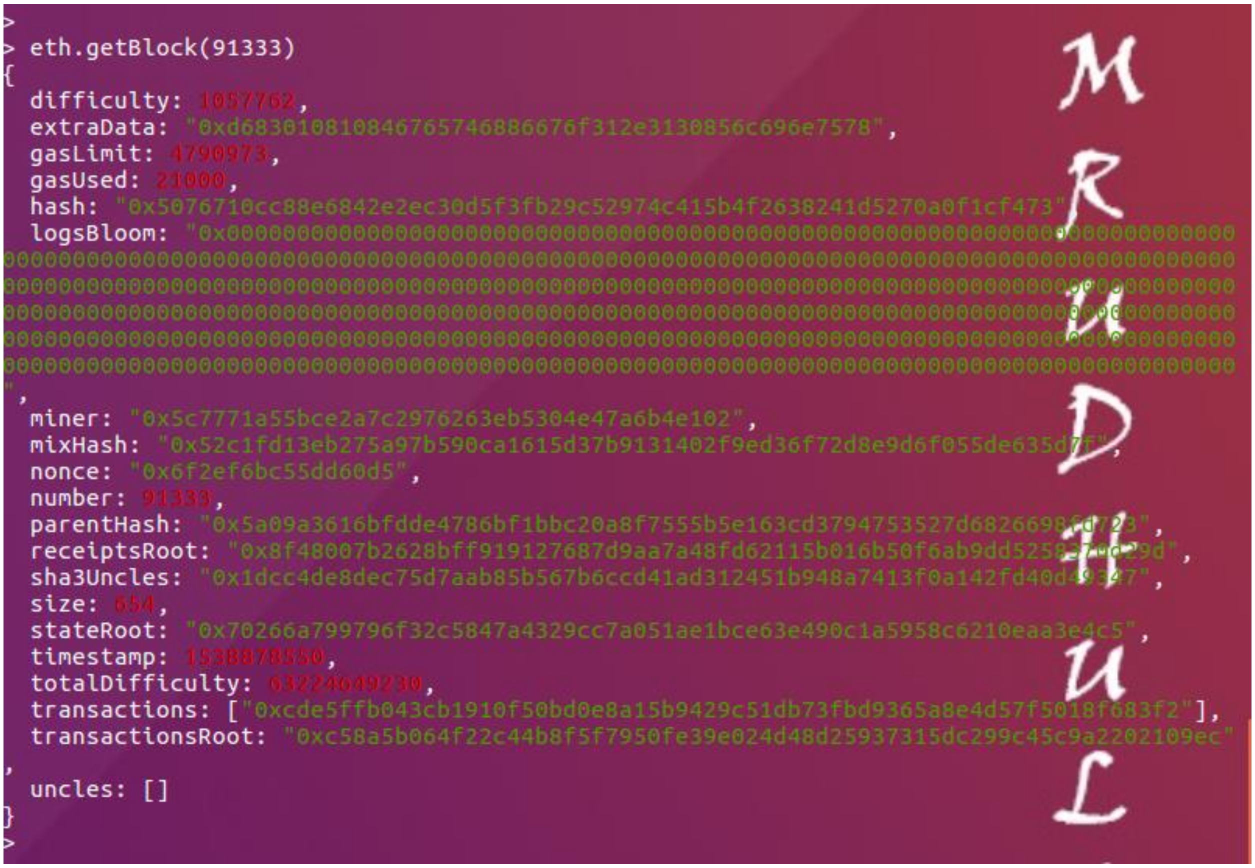
```
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")

216.529717
> var tx= {from:"0x1a0aeb2893f19e854eabdc4822b51693cd1321c5", to:"0xeb870c6691456ab649f358323d196e680
a6daea7", value:web3.toWei(15,"ether")}
undefined
> personal.sendTransaction(tx, "mrudhula")
"0xcde5ffb043cb1910f50bd0e8a15b9429c51db73fbd9365a8e4d57f5018f683f2"
> txpool.status
{
  pending: 1,
  queued: 0
}
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")

201.529696
> eth.getTransaction("0xcde5ffb043cb1910f50bd0e8a15b9429c51db73fbd9365a8e4d57f5018f683f2")
{
  blockHash: "0x5076710cc88e6842e2ec30d5f3fb29c52974c415b4f2638241d5270a0f1cf473",
  blockNumber: 91333,
  from: "0x1a0aeb2893f19e854eabdc4822b51693cd1321c5",
  gas: 90000,
  gasPrice: 1000000000,
  hash: "0xcde5ffb043cb1910f50bd0e8a15b9429c51db73fbd9365a8e4d57f5018f683f2",
  input: "0x",
  nonce: 6,
  r: "0xbfbac6e49dda80e67678429da925a97993889a3da2ceb3bad9dadf06447d87e7",
  s: "0x7d7ae4cd1db4ffc57313c6aef96c3ff9d775998e1b759a0e9a1e7f338ec8584f",
  to: "0xeb870c6691456ab649f358323d196e680a6daea7",
  transactionIndex: 0,
  v: "0xaba56c8",
  value: 15000000000000000000
}
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
216.529696
```

Balance before sending transaction

Send Transaction using passphrase

Transaction id

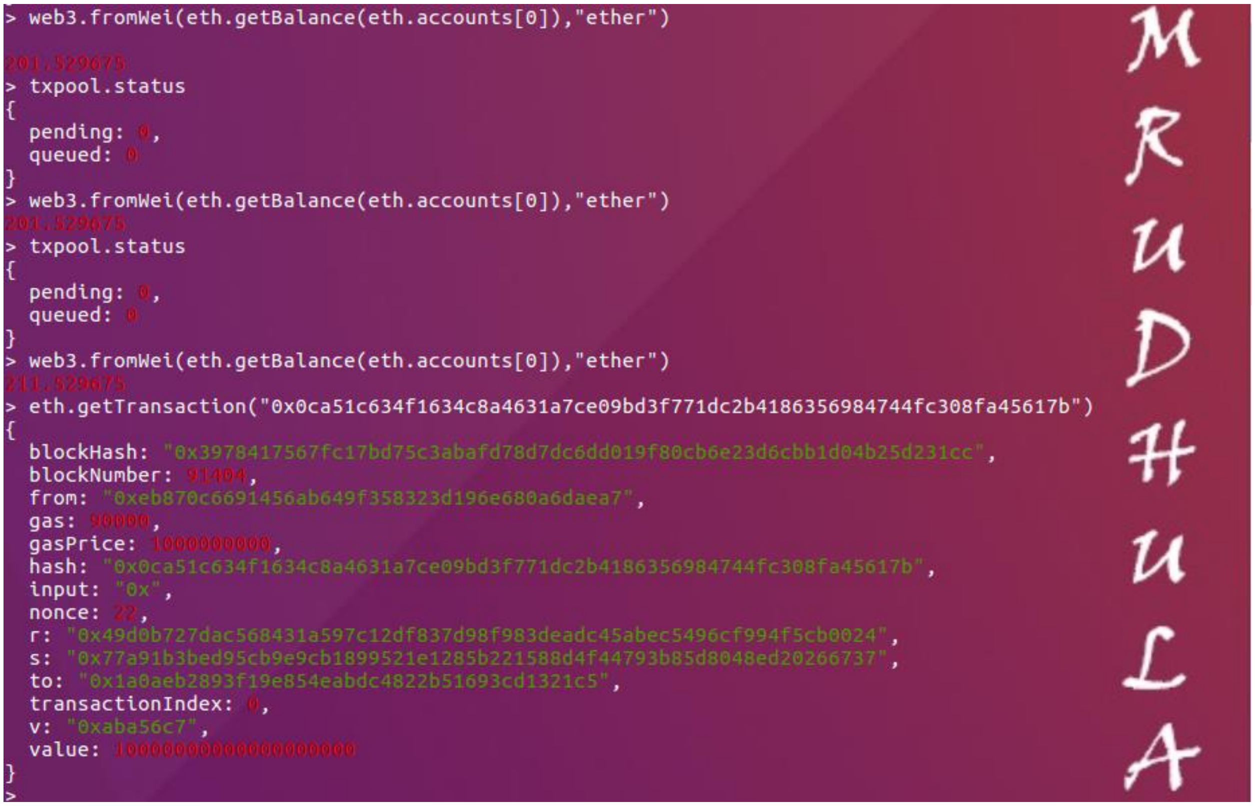
Balance after sending transaction



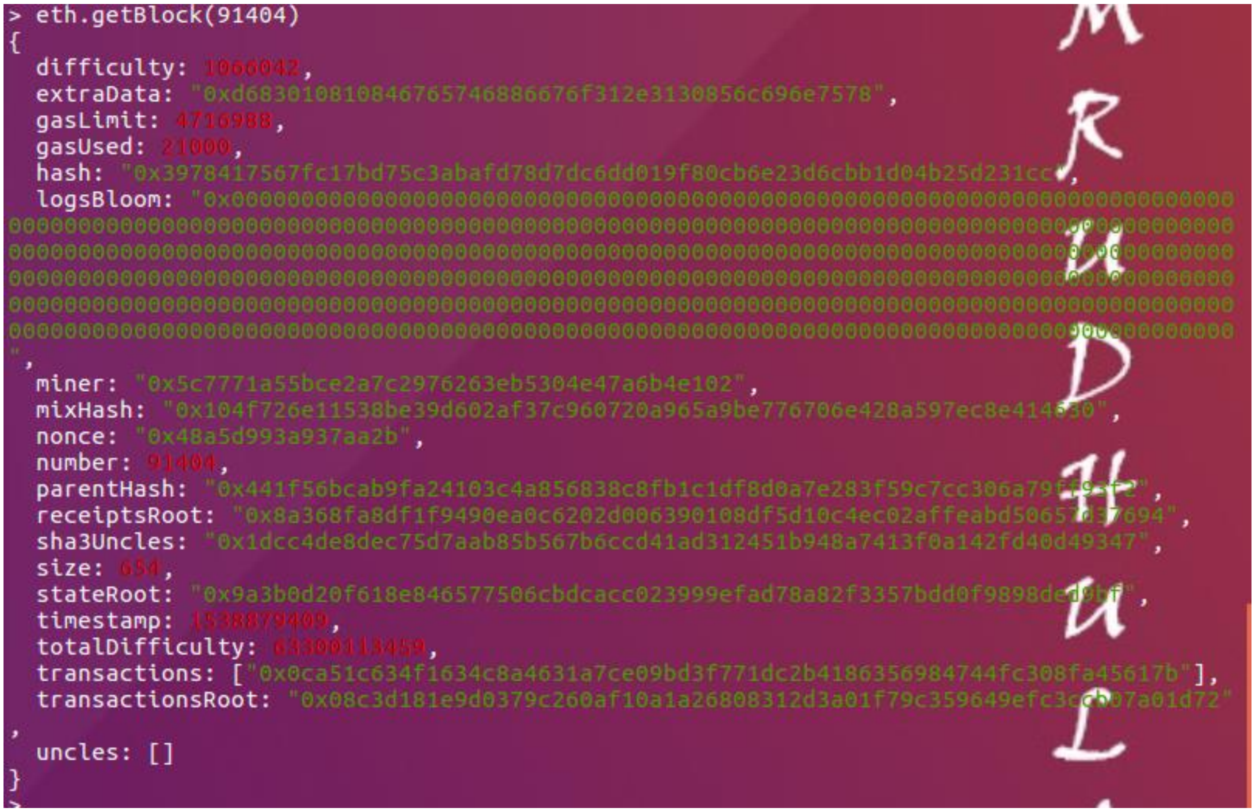
```
>
> eth.getBlock(91333)
{
  difficulty: 1057762,
  extraData: "0xd683010810846765746886676f312e3130856c696e7578",
  gasLimit: 4790973,
  gasUsed: 21000,
  hash: "0x5076710cc88e6842e2ec30d5f3fb29c52974c415b4f2638241d5270a0f1cf473",
  logsBloom: "0x000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
",
  miner: "0x5c7771a55bce2a7c2976263eb5304e47a6b4e102",
  mixHash: "0x52c1fd13eb275a97b590ca1615d37b9131402f9ed36f72d8e9d6f055de635d7f",
  nonce: "0x6f2ef6bc55dd60d5",
  number: 91333,
  parentHash: "0x5a09a3616bfdde4786bf1bbc20a8f7555b5e163cd3794753527d6826698fd723",
  receiptsRoot: "0x8f48007b2628bff919127687d9aa7a48fd62115b016b50f6ab9dd525837cd29d",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 654,
  stateRoot: "0x70266a799796f32c5847a4329cc7a051ae1bce63e490c1a5958c6210eaa3e4c5",
  timestamp: 1538878550,
  totalDifficulty: 63224649230,
  transactions: ["0xcde5ffb043cb1910f50bd0e8a15b9429c51db73fbd9365a8e4d57f5018f683f2"],
  transactionsRoot: "0xc58a5b064f22c44b8f5f7950fe39e024d48d25937315dc299c45c9a2202109ec"
,
  uncles: []
}
>
```

In this task, we send transaction from one account to another and then check initial and final balance. In instance one I initially check my balance and see that I have 216 ethers and the send a transaction to my friend of 15 ethers. To send the transaction from one account to another that is suppose from my account to A's account I will have to send transaction using my passphrase. After that I check for status of that particular transaction and see if it is sent i.e; if it is pending or queued. I notice that it is pending and then we give it another minute and check pending status is 0 and the transaction is been made. Then we check our balance again, now my current balance is 201 ethers. Then we get the details of transaction using the transaction id and we obtain from whom it is sent to who and how much ether is sent with block number. We can obtain the block detail by provide the block number as shown above.

I can send a transaction using my private key and the receiver can obtain using my public key.



```
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")

201.529675
> txpool.status
{
  pending: 0,
  queued: 0
}
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
201.529675
> txpool.status
{
  pending: 0,
  queued: 0
}
> web3.fromWei(eth.getBalance(eth.accounts[0]),"ether")
211.529675
> eth.getTransaction("0x0ca51c634f1634c8a4631a7ce09bd3f771dc2b4186356984744fc308fa45617b")
{
  blockHash: "0x3978417567fc17bd75c3abafd78d7dc6dd019f80cb6e23d6cbb1d04b25d231cc",
  blockNumber: 91404,
  from: "0xeb870c6691456ab649f358323d196e680a6daea7",
  gas: 90000,
  gasPrice: 1000000000,
  hash: "0x0ca51c634f1634c8a4631a7ce09bd3f771dc2b4186356984744fc308fa45617b",
  input: "0x",
  nonce: 22,
  r: "0x49d0b727dac568431a597c12df837d98f983deadc45abec5496cf994f5cb0024",
  s: "0x77a91b3bed95cb9e9cb1899521e1285b221588d4f44793b85d8048ed20266737",
  to: "0x1a0aeb2893f19e854eabdc4822b51693cd1321c5",
  transactionIndex: 0,
  v: "0xaba56c7",
  value: 10000000000000000000
}
>
```



```
> eth.getBlock(91404)
{
  difficulty: 1066042,
  extraData: "0xd683010810846765746886676f312e3130856c696e7578",
  gasLimit: 4716988,
  gasUsed: 21000,
  hash: "0x3978417567fc17bd75c3abafd78d7dc6dd019f80cb6e23d6cbb1d04b25d231cc",
  logsBloom: "0x000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
",
  miner: "0x5c7771a55bce2a7c2976263eb5304e47a6b4e102",
  mixHash: "0x104f726e11538be39d602af37c960720a965a9be776706e428a597ec8e414630",
  nonce: "0x48a5d993a937aa2b",
  number: 91404,
  parentHash: "0x441f56bcab9fa24103c4a856838c8fb1c1df8d0a7e283f59c7cc306a79ff9af2",
  receiptsRoot: "0x8a368fa8df1f9490ea0c6202d006390108df5d10c4ec02affeabd50657d37694",
  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",
  size: 654,
  stateRoot: "0x9a3b0d20f618e846577506cbdcacc023999efad78a82f3357bdd0f9898de09bf",
  timestamp: 1538879409,
  totalDifficulty: 63300113459,
  transactions: ["0x0ca51c634f1634c8a4631a7ce09bd3f771dc2b4186356984744fc308fa45617b"],
  transactionsRoot: "0x08c3d181e9d0379c260af10a1a26808312d3a01f79c359649efc3ccb07a01d72"
,
  uncles: []
}
>
```

In the second instance my friend sends me the ether. For that I initial check my balance and I find that I have 201 ethers, then she sends me 10 ethers then after a minute I check my balance once again and notice that the 10 ethers sent from my friend has been added and now I have a total of 211 ethers. To check for the details of that transaction she sent me her transaction id and then as first instance we do the same get all the details. I can get transaction using my friends public key.

Commands Used:

```
web3.fromWei(eth.getBalace(eth.accounts[0]),”ether”)
var tx={from:”senderAccount”,  to:”receiverAccount”,  value:web3.fromWei(amount, “ether”)}
personal.sendTransaction(tx,”passphrase”)
txpool.status
eth.getTransaction(“transactionId”)
```