

```
FOLDERS
▼ SATWIKHOSAMANI

--> Downloading from https://d29vzk4ow07wi1.cloudfront.net/104bea4cb698b9561cef9f0c55c468997693122bbe139efd44898316dea399237response-c
##### 100.0%
--> Pouring ethereum-1.9.22.catalina.bottle.tar.gz
/usr/local/Cellar/ethereum/1.9.22: 20 files, 296.0MB
<SatwikHosamani>mkdir -p ~/lab1/bkc_data
<SatwikHosamani>cd ~/lab1
<SatwikHosamani>geth --datadir bkc_data init ~/lab1/genesis.json # create a database that uses this genesis block
Fatal: Failed to read genesis file: open /Users/prince/lab1/genesis.json: no such file or directory
<SatwikHosamani>gedit genesis.json
bash: gedit: command not found
<SatwikHosamani>sudo apt-get install software-properties-common
Password:
sudo: apt-get: command not found
<SatwikHosamani>sudo apt-get update
sudo: apt-get: command not found
<SatwikHosamani>geth --datadir bkc_data init ~/lab1/genesis.json
Fatal: Failed to read genesis file: open /Users/prince/lab1/genesis.json: no such file or directory
<SatwikHosamani>geth --datadir bkc_data init ~/lab1/genesis.json
[INFO [09-28|19:32:09.353] Maximum peer count          ETH=50 LES=0 total=50
[INFO [09-28|19:32:09.373] Set global gas cap          cap=25000000
[INFO [09-28|19:32:09.373] Allocated cache and file handles database=/Users/prince/lab1/bkc_data/geth/chaindata cache=16.00MiB handles=16
[INFO [09-28|19:32:09.405] Writing custom genesis block
[INFO [09-28|19:32:09.406] Persisted trie from memory database nodes=0 size=0.00B time="236.28µs" gcnodes=0 gcsiz=0.00B gctime=0s livenodes=1 livesize=0.00B
[INFO [09-28|19:32:09.407] Successfully wrote genesis state database=chaindata hash="b913d0..07d3df"
[INFO [09-28|19:32:09.407] Allocated cache and file handles database=/Users/prince/lab1/bkc_data/geth/lightchaindata cache=16.00MiB handles=16
[INFO [09-28|19:32:09.425] Writing custom genesis block
[INFO [09-28|19:32:09.425] Persisted trie from memory database nodes=0 size=0.00B time="2.174µs" gcnodes=0 gcsiz=0.00B gctime=0s livenodes=1 livesize=0.00B
[INFO [09-28|19:32:09.426] Successfully wrote genesis state database=lightchaindata hash="b913d0..07d3df"
<SatwikHosamani>geth --datadir bkc_data init ~/lab1/genesis.json # create a database that uses this genesis block
[INFO [09-28|19:33:17.097] Maximum peer count          ETH=50 LES=0 total=50
[INFO [09-28|19:33:17.114] Set global gas cap          cap=25000000
[INFO [09-28|19:33:17.114] Allocated cache and file handles database=/Users/prince/lab1/bkc_data/geth/chaindata cache=16.00MiB handles=16
[INFO [09-28|19:33:17.150] Persisted trie from memory database nodes=0 size=0.00B time="6.746µs" gcnodes=0 gcsiz=0.00B gctime=0s livenodes=1 livesize=0.00B
[INFO [09-28|19:33:17.151] Successfully wrote genesis state database=chaindata hash="b913d0..07d3df"
[INFO [09-28|19:33:17.151] Allocated cache and file handles database=/Users/prince/lab1/bkc_data/geth/lightchaindata cache=16.00MiB handles=16
[INFO [09-28|19:33:17.182] Persisted trie from memory database nodes=0 size=0.00B time="1.822µs" gcnodes=0 gcsiz=0.00B gctime=0s livenodes=1 livesize=0.00B
[INFO [09-28|19:33:17.183] Successfully wrote genesis state database=lightchaindata hash="b913d0..07d3df"
<SatwikHosamani>geth --datadir bkc_data --networkid 89992018 --bootnodes enode://7320559847736145843099b94c6c67d52c3abd4af42200dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303 console.log
Welcome to the Geth JavaScript console!

instance: Geth/v1.9.22-stable/darwin-amd64/go1.15.2
at block: 0 (Wed Dec 31 1969 19:00:00 GMT-0500 (EST))
```

Checking network:

```
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datadir: /Users/prince/lab1/bkc_data
modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0 txpool:1.0 web3:1.0

> admin.addPeer("enode://7320559847736145843099b94c6c67d52c3abd4af42200dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303")
true
> admin.peers
[]
> admin.addPeer("enode://7320559847736145843099b94c6c67d52c3abd4af42200dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303")
true
> admin.peers
[]
> admin.addPeer("enode://7320559847736145843099b94c6c67d52c3abd4af42200dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303")
true
> admin.addPeer("enode://7320559847736145843099b94c6c67d52c3abd4af42200dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303")
true
> admin.peers
[]

[[
  caps: ["eth/63", "eth/64", "eth/65"],
  enode: "enode://7320559847736145843099b94c6c67d52c3abd4af42200dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303",
  id: "3fecb30cf93a6c1b7a6b38436d22e86cb3e0886d547cab41667d489c0a2dea25",
  name: "Geth/v1.9.12-stable/linux-amd64/go1.13.3",
  network: {
    inbound: false,
    localAddress: "192.168.1.89:49691",
    remoteAddress: "128.230.208.73:30303",
    static: true,
    trusted: false
  },
  protocols: {
    eth: {
      difficulty: 20130867071,
      head: "0x9f980c59f2c388f2204e804d1b8748122e8d8da445b39d924b4dc7ae699bb3d",
      version: 65
    }
  }
}]
```

```

> admin.peers
[[
  {
    caps: ["eth/63", "eth/64", "eth/65"],
    enode: "enode://7320559847736145843099b94c6c67d52c3abd4af4220dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303",
    id: "3fecb30cf93a6c1b7a6b38436d22e06cb3e0886d547cab41667d489c0a2dea25",
    name: "Geth/v1.9.12-stable/linux-amd64/go1.13.3",
    network: {
      inbound: false,
      localAddress: "192.168.1.89:51408",
      remoteAddress: "128.230.208.73:30303",
      static: false,
      trusted: false
    },
    protocols: {
      eth: {
        difficulty: 31465891771,
        head: "0xda6fd943be571ee082cf1e4df179f4477e068112c4d7592c79b7d5b7a7e75511",
        version: 65
      }
    }
  }, {
    caps: ["eth/63", "eth/64", "eth/65"],
    enode: "enode://366f2c0c2f05ac10efa9a409f35f7144b5994c964e519a1190e637a7f5296ecb4836e1f09585e5bcae1a5a59143eaffeebd1c1905de8e3b6913b60c3bb535e701.69.97.234:59427",
    id: "5dfc5d73ca183eacac4fb95103ee922c9a0ae73a45be61218af640871d4a6ef",
    name: "Geth/v1.9.21-stable-0287d548/linux-amd64/go1.15",
    network: {
      inbound: true,
      localAddress: "192.168.1.89:30303",
      remoteAddress: "1.69.97.234:59427",
      static: false,
      trusted: false
    },
    protocols: {
      eth: {
        difficulty: 31481647589,
        head: "0xc0540b79d84c13bcfc5d4d7c7714ff6bea212ed8c1a63ce21880a17e7f1867b",
        version: 65
      }
    }
  }
]

```

Creating New Account and Checking Balance:

```

> eth.accounts
["0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c"]
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
20
>
> personal.newAccount()
Passphrase:
Repeat passphrase:
"0xe0e249319315ccc6c26c91ed7121cebe9e43fc08"
> eth.accounts
["0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c", "0xe0e249319315ccc6c26c91ed7121cebe9e43fc08"]

```

Task 1: Mining Coins

```

> eth.accounts
["0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c", "0xe0e249319315ccc6c26c91ed7121cebe9e43fc08", "0xc2f2c391bb5681774a31db30ff30126b9600f6d1"]
> personal.unlockAccount("0xe0e249319315ccc6c26c91ed7121cebe9e43fc08", "2702")
true
> miner.start(1)
null
> miner.getHashrate()
0
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
20
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
20
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
60
> miner.getHashrate()
65320
> miner.getHashrate()
65861
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
60
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
60
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
55
> web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
55
> admin.peers
[[
  {
    caps: ["eth/63", "eth/64", "eth/65"],
    enode: "enode://7320559847736145843099b94c6c67d52c3abd4af4220dde25557d58da3f36358b6a029ff37058461ee5e627aed6fb55386c3e334b54fa35480aee4ea73eb610128.230.208.73:30303",
    id: "3fecb30cf93a6c1b7a6b38436d22e06cb3e0886d547cab41667d489c0a2dea25",
    name: "Geth/v1.9.12-stable/linux-amd64/go1.13.3",
    network: {
      inbound: false,
      localAddress: "192.168.1.89:51408",
      remoteAddress: "128.230.208.73:30303",
      static: false,
      trusted: false
    },
    protocols: {
      eth: {
        difficulty: 31465891771,
        head: "0xda6fd943be571ee082cf1e4df179f4477e068112c4d7592c79b7d5b7a7e75511",
        version: 65
      }
    }
  }, {
    caps: ["eth/63", "eth/64", "eth/65"],
    enode: "enode://366f2c0c2f05ac10efa9a409f35f7144b5994c964e519a1190e637a7f5296ecb4836e1f09585e5bcae1a5a59143eaffeebd1c1905de8e3b6913b60c3bb535e701.69.97.234:59427",
    id: "5dfc5d73ca183eacac4fb95103ee922c9a0ae73a45be61218af640871d4a6ef",
    name: "Geth/v1.9.21-stable-0287d548/linux-amd64/go1.15",
    network: {
      inbound: true,
      localAddress: "192.168.1.89:30303",
      remoteAddress: "1.69.97.234:59427",
      static: false,
      trusted: false
    },
    protocols: {
      eth: {
        difficulty: 31481647589,
        head: "0xc0540b79d84c13bcfc5d4d7c7714ff6bea212ed8c1a63ce21880a17e7f1867b",
        version: 65
      }
    }
  }
]

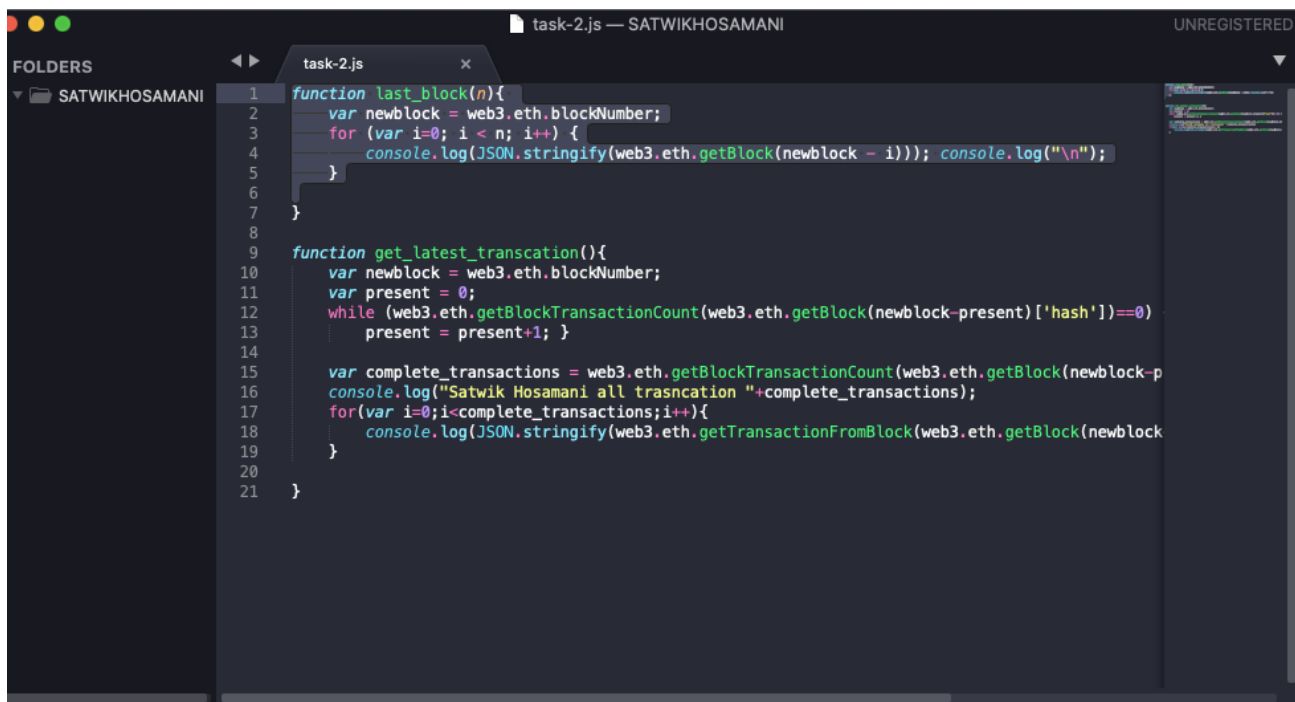
```

Task 2: Show the content (show the latest three blocks and the latest transaction) on the blockchain. Then wait 1 minute, show the blockchain again to see how it is extended over time.

```
function last_block(n){
    var newblock = web3.eth.blockNumber;
    for (var i=0; i < n; i++) {
        console.log(JSON.stringify(web3.eth.getBlock(newblock - i))); console.log("\n");
    }
}

function get_latest_transcation(){
    var newblock = web3.eth.blockNumber;
    var present = 0;
    while (web3.eth.getBlockTransactionCount(web3.eth.getBlock(newblock-present)['hash'])==0) {
        present = present+1; }

    var complete_transactions = web3.eth.getBlockTransactionCount(web3.eth.getBlock(newblock-present)['hash'])
    console.log("Satwik Hosamani all trasncation "+complete_transactions);
    for(var i=0;i<complete_transactions;i++){
        console.log(JSON.stringify(web3.eth.getTransactionFromBlock(web3.eth.getBlock(newblock-present)['hash'], i))); console.log("\n");
    }
}
```



```
task-2.js — SATWIKHOSAMANI
UNREGISTERED

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    task-2.js
      1 function last_block(n){
      2     var newblock = web3.eth.blockNumber;
      3     for (var i=0; i < n; i++) {
      4         console.log(JSON.stringify(web3.eth.getBlock(newblock - i))); console.log("\n");
      5     }
      6 }
      7
      8
      9 function get_latest_transcation(){
     10     var newblock = web3.eth.blockNumber;
     11     var present = 0;
     12     while (web3.eth.getBlockTransactionCount(web3.eth.getBlock(newblock-present)['hash'])==0)
     13         present = present+1; }
     14
     15     var complete_transactions = web3.eth.getBlockTransactionCount(web3.eth.getBlock(newblock-p
     16     console.log("Satwik Hosamani all trasncation "+complete_transactions);
     17     for(var i=0;i<complete_transactions;i++){
     18         console.log(JSON.stringify(web3.eth.getTransactionFromBlock(web3.eth.getBlock(newblock
     19     }
     20 }
     21 }
```


[illegible][illegible]

```

undefined
[> get_latest_transaction()]
Satwik Hosamani all transaction 2
{"blockHash": "0xf4b055b5b5e7195912890f2271f740f262fc043e2a67a7394f467c8f11b75892", "blockNumber": 38567, "from": "0xf168c0197de148ac3c48e3e379d875452c9366ce", "gas": 21000, "gasPrice": "1000000000", "hash": "0x2efbcebd7270d7ff701835956d221528f83917232aa555b1be6e1735eae0234", "input": "0x", "nonce": 0, "to": "0x415a20323b6c23b8ef2833b5fc0d11ece88d906b", "transactionIndex": 0, "value": "1000000000000000000", "v": "0xaba56c8", "r": "0x2081347b7d0c308d1cd3e9e285db6d95c0fb65d69c2bd7406f21243ad3f7c142", "s": "0x46a0087ec16cf7920a45b0654c7a9ca2f404e6dc74c5763c6967d0dfbd4da49e"}

{"blockHash": "0xf4b055b5b5e7195912890f2271f740f262fc043e2a67a7394f467c8f11b75892", "blockNumber": 38567, "from": "0xf168c0197de148ac3c48e3e379d875452c9366ce", "gas": 21000, "gasPrice": "1000000000", "hash": "0xe910372363c22e8e442bbc74cbcf61e4deceacebe794d4fd29e7533e2a748293", "input": "0x", "nonce": 1, "to": "0x415a20323b6c23b8ef2833b5fc0d11ece88d906b", "transactionIndex": 1, "value": "1000000000000000000", "v": "0xaba56c8", "r": "0x130e51caa8b8236f10d9e4fc81535f9de64c14e3d9446bb260a3e6d925e69ee6", "s": "0x2df9e35f8e8dc24892a5f4d0c0fcd56cade2db4cceb713c511394734751b9aff"}

undefined
> 

```

Task 3: 1. Submit a transaction, say tx5, to the blockchain. You create another account as the recipient (seller) of the transaction. 2. Show whether transaction tx5 is included in the Blockchain; if not wait for a while, check again.

```

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SATWIKHOSAMANI 1 > eth.accounts
2 ["0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c", "0xe0e249319315ccc6c26c91ed7121cebe9e43fc08", "0xc2f2c391bb5681774a31db30ff30126b9600f6d1"]
3
4 > personal.unlockAccount(eth.accounts[1])
5 Unlock account 0xe0e249319315ccc6c26c91ed7121cebe9e43fc08
6 Passphrase:
7 true
8
9 > personal.unlockAccount(eth.accounts[0])
10 Unlock account 0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c
11 Passphrase:
12 true
13
14 > web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
15 1441.562584
16
17 > web3.fromWei(eth.getBalance(eth.accounts[1]), "ether")
18 0
19
20 > web3.fromWei(eth.getBalance(eth.accounts[0]), "ether")
21 1441.562584
22
23 > web3.fromWei(eth.getBalance(eth.accounts[1]), "ether")
24 0
25
26 > web3.fromWei(eth.getBalance(eth.accounts[1]), "ether")
27 0
28
29 > eth.sendTransaction({from: "0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c", to: "0xe0e249319315ccc6c26c91ed7121cebe9e43fc08", value: web3.toWei(1, "ether")})
30 "0x051eb24f467c3db61d4b51c3a65d4c9fa63cdd597f52774767703a2cd6129a46"
31 > eth.getTransaction("0x051eb24f467c3db61d4b51c3a65d4c9fa63cdd597f52774767703a2cd6129a46")
32 {
33   blockHash: "0xecd7db95586fb2e25462d3020053a2b1b22784e0ce5143f81086f3cd1f2f2d4a",
34   blockNumber: 38814,
35   from: "0xdf37b09f50fd3ac8993c00e2c8de3651010f7f6c",
36   gas: 21000,
37   gasPrice: 1000000000,
38   hash: "0x051eb24f467c3db61d4b51c3a65d4c9fa63cdd597f52774767703a2cd6129a46",
39   input: "0x",
40   nonce: 0,
41   r: "0x8c7c686557a2a16e4e747ef60658485ab4e5413a9df391ec65b793c87951f089",
42   s: "0x7dabf3a69a3aa8b1682fd03d07b1f636cbe998277e39277ba7678d0ed1ba3f40",
43   to: "0xe0e249319315ccc6c26c91ed7121cebe9e43fc08",
44   transactionIndex: 0,
45   v: "0xaba56c8",
46   value: 1000000000000000000
47 }
48 > eth.blockNumber
49 38832
50 > eth.blockNumber
51 38901
52 > eth.getBlock(38829, true)
53 {
54   difficulty: 3017218,
55   extraData: "0xd683010915846765746886676f312e3135856c696e7578",
56   gasLimit: 8000000,
57   gasUsed: 0,

```

CIS 600 – BLOCKCHAIN AND CRYPTOCURRENCIES LAB-1