**Homework 1**

1. Total points: **110**
2. Deadline: **Oct. 16 11:59pm**
3. Submission: <https://classroom.google.com/u/0/c/NDQxNzQ2NDYxOTJa>

**Install Geth**

You will find the instructions for installing geth [here](https://geth.ethereum.org/docs/install-and-build/installing-geth).

**Check the version of geth**

|  |
| --- |
| $ geth version Geth Version: 1.8.16-unstable Git Commit: 62e94895da80838ec694b4ba19eeac80c9dc88c1 Architecture: amd64 Protocol Versions: [63 62] Network Id: 1 Go Version: go1.11 Operating System: darwin GOPATH=/Users/changwu/golang GOROOT=/usr/local/opt/go/libexec |

**[Paste your geth version here.] (5%)**

**Run a local devnet**

|  |
| --- |
| $ geth --dev --dev.period 5 --rpc --rpcapi "eth,web3,personal" |

What do the above command and its options mean?

**[Please answer the question here.] (10%)**

**geth**啟動指令碼

- -dev **:** 使用POA共識網路

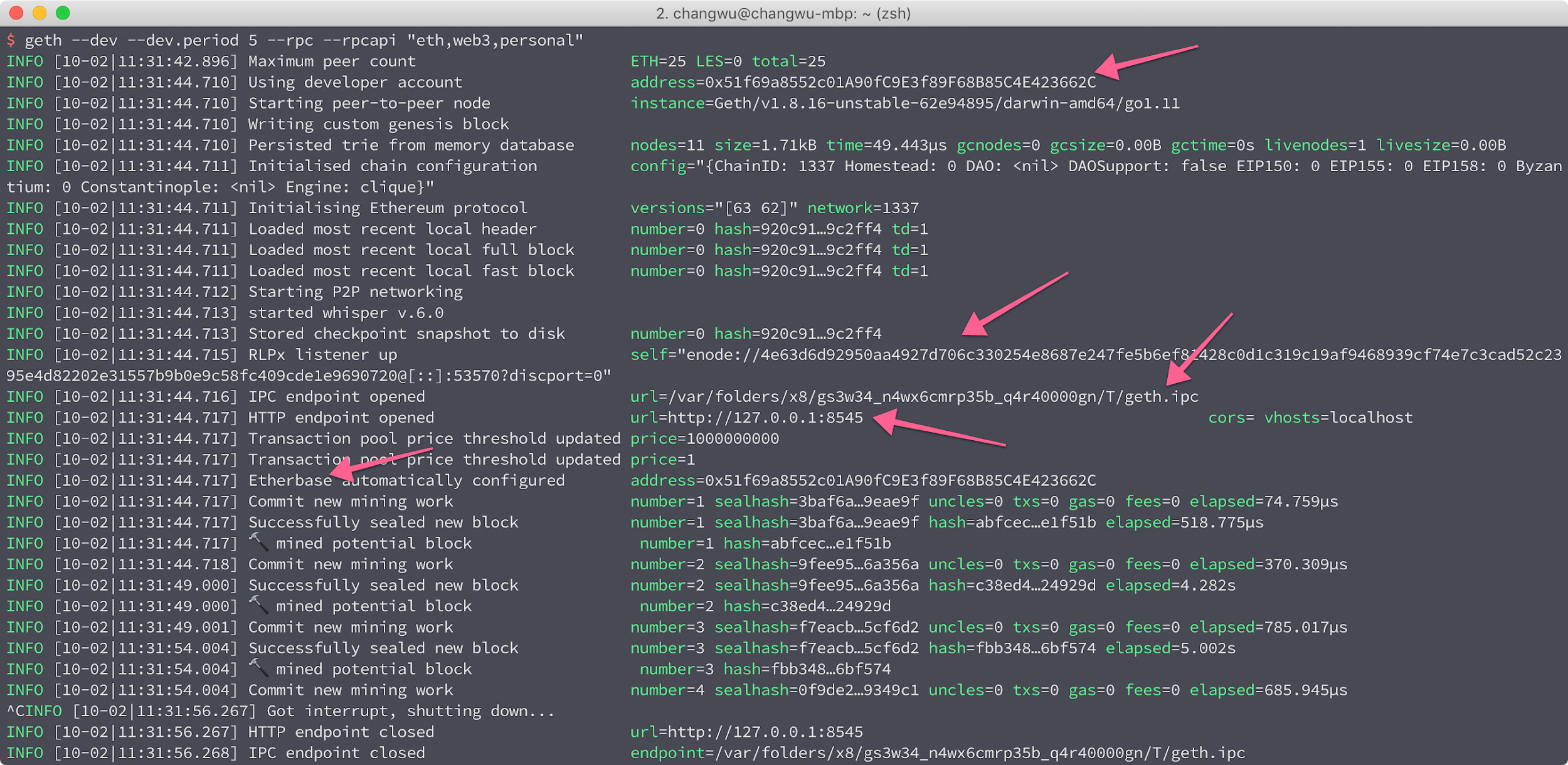
- -dev.period value : 挖礦週期

- -rpc : 啟用HTTP-RPC服務器

- -rpcapi : 基於HTTP-RPC接口提供的API

1. --dev: [???]
2. --dev.period 5: [???]
3. --rpc: [???]
4. --rpcapi "eth,web3,personal": [???]

**Client log**

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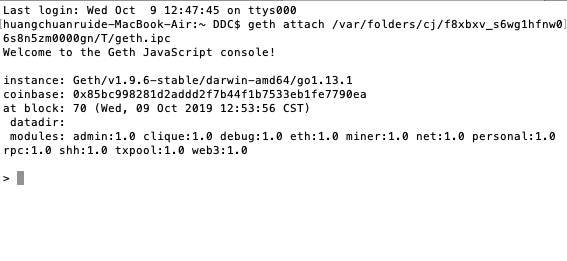
**[Please answer the question here.] (25%)**

1. What is address? 類似於電子郵件地址：它用於在區塊鍊網絡上接收和發送資金（就像使用電子郵件地址發送和接收消息一樣），並代表加密貨幣支付的目的地。
2. What is enode id in Ethereum? enode是一種以URI形式描述以太坊節點的方法。
3. What is geth.ipc used for? 只有當Geth運行的時候才存在，本機透過 geth 與 Ethereum 做互動的管道
4. What is Ethereum HTTP or Websocket endpoint? Ethereum HTTP :對外的一個端口Websocket :This protocol is used to connect to Geth using sockets.
5. What is Etherbase? 獲得挖礦獎勵的默認帳戶

**Attach to local geth console**

Find the path of geth.ipc from the log.

|  |
| --- |
| $ geth attach /var/folders/x8/gs3w34\_n4wx6cmrp35b\_q4r40000gn/T/geth.ipc Welcome to the Geth JavaScript console!  instance: Geth/v1.8.16-unstable-62e94895/darwin-amd64/go1.11 coinbase: 0x049d00a5021081d9da04cbb52665dd0f33e9bd9b at block: 2 (Wed, 02 Oct 2019 11:43:25 CST)  datadir:  modules: admin:1.0 clique:1.0 debug:1.0 eth:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0 shh:1.0 txpool:1.0 web3:1.0 > eth.coinbase "0x049d00a5021081d9da04cbb52665dd0f33e9bd9b" |

**[Please paste your operation here.] (5%)**

**Questions**

|  |
| --- |
| > eth.getBlock(10) {  difficulty: 2,  extraData: "0xd783010810846765746886676f312e31318664617277696e00000000000000005e3ce39d3629e171a792f9480a0185cf34b49b1905892a48f77753093efe72762cbc56bbf83be61ef5dbc83e3823a67cf24501ea05e58e5774d1ebbf5491f63100",  gasLimit: 6344797,  gasUsed: 0,  hash: "0x704d97e9a1bfebcf1353d1daea46db32dd817a3d4ca68d45a1dfcb6baa5814c1",  logsBloom: "0x00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000",  miner: "0x0000000000000000000000000000000000000000",  mixHash: "0x0000000000000000000000000000000000000000000000000000000000000000",  nonce: "0x0000000000000000",  number: 10,  parentHash: "0xdde6787c8465b3a1abbcc48c6a24cbc0c46eacfa594d5577fa71aadb37c6b396",  receiptsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",  sha3Uncles: "0x1dcc4de8dec75d7aab85b567b6ccd41ad312451b948a7413f0a142fd40d49347",  size: 606,  stateRoot: "0x4931658a78fa51c77c7f0ab095389937da3340adf6434c62eb7de64362a9aebb",  timestamp: 1569987845,  totalDifficulty: 21,  transactions: [],  transactionsRoot: "0x56e81f171bcc55a6ff8345e692c0f86e5b48e01b996cadc001622fb5e363b421",  uncles: [] } |

#### **1. Please get the info of block number 10**

**[Paste your result here.] (5%)**

#### **2. Please get the latest block info.**

**[Paste your command and result here.] (5%)**

#### **3. Create a new account with password "nccu"**

**[Paste your command and result here.] (5%)**

#### **4. Please check the balance of eth.coinbase.**

|  |
| --- |
| > web3.fromWei(eth.getBalance(eth.coinbase), 'ether') |

**[Paste your command and result here.] (5%)**

#### **5. Please check the balance of your new account.**

|  |
| --- |
| **web3.fromWei("YOUR\_NEW\_ACCOUNT\_ADDRESS", 'ether')** |

**[Paste your command and result here.] (5%)**

#### **6. Transfer 100 ETH from eth.coinbase to your new account.**

Tip: use eth.sendTransaction

**[Paste your command and result here.] (10%)**

#### **7. Check the transaction status.**

Tip: use eth.getTransactionReceipt

**[Paste your command and result here.] (10%)**

**Other questions**

1. What is mainnet and testnet? (10%)

mainnet：實際運行的分布式帳本，具有真實的經濟價值，是一條真正的區塊鏈，且任何任都可以使用．

testnet : 和mainnet具有相同技術，唯一差別就是假的，除測試功能外，不具備真正經濟 價值

1. How many testnets in Ethereum? (10%) Three Ropsten/Rinkeby/Kovan

**References**

1. <https://github.com/ethereum/go-ethereum/wiki/Command-Line-Options>
2. <https://github.com/ethereum/go-ethereum/wiki/Managing-your-accounts>
3. <https://github.com/ethereum/wiki/wiki/JSON-RPC>