

# Practical Project - Build A Blockchain Network

## Test Document

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### Description:

In this document we are testing the Kings Blockchain Network. In our test case , we have 5 users are participating and below are their roles and Identity details :

<b>Alice</b>	nodemon main.js --port=1550
<b>Bob</b>	
<b>Charlie</b>	nodemon main.js --port=3550 --mining=yes
<b>David</b>	nodemon main.js --port=4550 --mining=yes
<b>Elvis</b>	

### Their Private keys:

<b>Alice</b>	0x3802817c79c18fb5e49cdf0d38ab5044c68eb00fd130a25b3b68f5624062e897	Node
<b>Bob</b>	0x40433a49b442904f967207881af9ee119b6388edad43edb57b00fe979e2f4126	User
<b>Charlie</b>	0x0dd4f789eb11607f2a560e7c66e4dba7d8e59f8fb1d1267fb09bc77607f995e9	Node Miner
<b>David</b>	0x2570985e1dcf6db87287a761d217fed96960d3373a8033e1a3d3c64b3a00e1f1	Node Miner
<b>Elvis</b>	0xbc645fdec284192508f8af9c2b6ab207fdbd79b2cdeadad0c973e6fa8717a669a	User

### And Wallet addresses:

<b>Alice</b>	0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3
<b>Bob</b>	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
<b>Charlie</b>	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
<b>David</b>	0xdB87fd8098D081aE2613C00172CbABb5c11Cae3
<b>Elvis</b>	0x35c737abaA242e94795F1354FCA1EFA0D266F238

In this test , we consider that Nodes are not started yet and Alice is the first one to start the node in his system then others follow his node and expand the chain. Each actions by the participants are considered as activities in the network. Let start our first activity by Alice.

## Activity – 01:

Alice staring Kings Blockchain in his system( port 1550). Alice is not mining so only keeping the block records in his node.

**Command:** nodemon main.js --port=1550

Node has been started for Alice:

```
MacBook-Pro:Kingsland-Blockchain-2018-Group2-Project — node • node /usr/local/bin/nodemon main.js --port...
[nodemon] 1.18.10
[nodemon] to restart at any time, enter `rs`
[nodemon] watching: ***!
[nodemon] starting `node main.js --port=1550`
Is blockchain valid?true
localhost:1550 is added
Living at URL http://localhost:1550
2019-03-02 12:58:10 info : 1550: Chain Living at URL http://localhost:1550
2019-03-02 12:58:10 info : 1550: Socket connected, ID PAapkWyHWE8rk8-UAAAAA
```

### Alice Node Dashboard:

With Chain ID , Node ID with other Network Details

The screenshot shows the Alice Node Dashboard interface. At the top, there's a navigation bar with back, forward, and refresh buttons, and a URL field showing `localhost:1550/home?`. The main title is **Kings Blockchain Project**. Below the title are three buttons: **Faucet**, **Wallet**, and **Block Explorer**.

**Blockchain Information**

Chain ID	<b>1f8abb338d8ec021</b>
Node ID	<b>b7e357bef35b157a</b>
Started on	<b>Saturday, March 2nd, 2019, 12:58:10 PM</b>
Length	<b>1</b>
Nodes connected	<b>1</b>
Confirmed Transactions	<b>0</b>
Pending Transactions	<b>0</b>
Difficulty	<b>4</b>
Nonce	<b>10001</b>

**Add New Node**

Host ID:   
Port #:

**Add Node**

**Debug** **Reset Chain**

## Activity - 02 :

Alice Requesting Coins from Faucet. Alice Wallet **Address**:  
0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3

10 Free Coins sent to Wallet and it will be under his pending balance

The screenshot shows the Kings Faucet application interface. At the top, there's a navigation bar with back, forward, and refresh icons, followed by the URL 'localhost:1550/faucet'. The main title 'Kings Faucet' is displayed prominently. Below it, a 'Home' button is visible. The 'Faucet Status' section shows the address 'oxaoF2E777Ffd73E3158c4a979b266A57840FE69F7' and a balance of '40000000'. In the 'Receive Coin' section, there's a form to enter an address ('0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D') and a 'Receive Coin' button. A green notification box at the bottom states '10 Free Coins Sent Successfully to 0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3'.

Record is added to Pending Transaction:

The screenshot shows the Block Explorer interface. At the top, there are three buttons: 'Faucet', 'Wallet', and 'Block Explorer'. The 'Block Explorer' button is active. The 'Blockchain Information' section displays various metrics: Chain ID (1f8abb338d8ec021), Node ID (b7e357bef35b157a), Started on (Saturday, March 2nd, 2019, 12:58:10 PM), Length (1), Nodes connected (1), Confirmed Transactions (0), Pending Transactions (1), Difficulty (4), and Nonce (10001).

Alice Current Balance:

The screenshot shows a wallet application interface. At the top, there are three buttons: "Home" (orange), "Create New Wallet" (blue), and "Create from Private Key" (blue). Below the buttons, the title "Wallet Information" is displayed. A table provides the following details:

Address	oxaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3
SafeBalance	0
ConfirmedBalance	0
PendingBalance	10

A green message box at the bottom states: "New Wallet created from Private key provided 0x3802817c79c18fb5e49cdf0d38ab5044c68eb00fd130a25b3b68f5624062e897".

### Activity – 03:

Bob Requesting Coins from Faucet, his Wallet **Address**:

0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0

The screenshot shows the Kings Faucet application interface. At the top, the title "Kings Faucet" is displayed. Below the title, there is a "Home" button. The main area is titled "Faucet Status". A table provides the following details:

Address	oxaoF2E777Ffd73E3158c4a979b266A57840FE69F7
Balance	40000000

The next section is titled "Receive Coin". It has a form field for "Address" containing "0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D" and a blue "Receive Coin" button.

A green message box at the bottom states: "10 Free Coins Sent Successfully to 0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0".

## Activity – 04:

Bob is trying to request more coins:

And he failed to get it

The screenshot shows the Kings Faucet homepage. At the top, the title "Kings Faucet" is displayed. Below it, a "Home" button is visible. The main content area is titled "Faucet Status". It shows an "Address" field containing `oxa0F2E777Ffd73E3158c4a979b266A57840FE69F7` and a "Balance" field containing `40000000`. Below this, there is a "Receive Coin" section. It has an "Address" input field containing `0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0`, a "Receive Coin" button, and a message box stating "Please wait for an hour to get your next coins..Freee..!!".

Bobs current Balance:

The screenshot shows the Kingsland University wallet information page. At the top, there are three buttons: "Home" (orange), "Create New Wallet" (blue), and "Create from Private Key" (blue). The main content area is titled "Wallet Information". It displays the following balance details:

Address	<code>0xF4AA21d14526297Af26B34785D3E1B46e7Cofedo</code>
SafeBalance	<code>0</code>
ConfirmedBalance	<code>0</code>
PendingBalance	<code>10</code>

A message box at the bottom states "New Wallet created from Private key provided" followed by the private key value `0x40433a49b442904f967207881af9ee119b6388edad43edb57b00fe979e2f4126`.

## Activity – 05:

Charlie starting Kings Blockchain (port 3550) and activating mining in his node

```
MacBook-Pro:Kingsland-Blockchain-2018-Group2-Project — node < node /usr/local/bin/nodemon main.js --port=3550 --mining=yes
[nodemon] 1.18.10
[nodemon] to restart at any time, enter `rs`
[nodemon] watching: ***!
[nodemon] starting `node main.js --port=3550 --mining=yes`
Is blockchain valid?true
localhost:3550 is added
Living at URL http://localhost:3550
2019-03-02 13:13:50 info : 3550: Chain Living at URL http://localhost:3550
2019-03-02 13:13:50 info : 3550: Socket connected, ID n45h6Oip87R5NIhXAAAA
```

### Charlie's Node Dashboard:

Charlie not yet added his node to existing network, so he has use own chain ID with no nodes connected

The screenshot shows the Kings Blockchain Project Node Dashboard. At the top, there is a navigation bar with links for 'Faucet', 'Wallet', 'Block Explorer', and 'Mining Console'. Below the navigation bar, the main content area is titled 'Blockchain Information' and displays the following data:

Chain ID	f4856be75eaco46b
Node ID	30bc9905fd61769f
Started on	Saturday, March 2nd, 2019, 1:13:50 PM
Length	1
Nodes connected	1
Confirmed Transactions	0
Pending Transactions	0
Difficulty	4
Nonce	10001

Below this section is a form titled 'Add New Node' with fields for 'Host ID' (localhost) and 'Port #' (5550), and a blue 'Add Node' button.

At the bottom of the dashboard, there are two buttons: 'Debug' and 'Reset Chain'.

Alice Adding Charlie's node to his node:

The screenshot shows the Kings Blockchain Project web application. At the top, there are three buttons: 'Faucet' (disabled), 'Wallet' (disabled), and 'Block Explorer'. Below these, a section titled 'Blockchain Information' displays the following data:

Chain ID	1f8abb338d8eco21
Node ID	b7e357bef35b157a
Started on	Saturday, March 2nd, 2019, 12:58:10 PM
Length	1
Nodes connected	2
Confirmed Transactions	0
Pending Transactions	2
Difficulty	4
Nonce	10001

Below this, there is a 'Add New Node' form with fields for 'Host ID' (localhost) and 'Port #' (5550). A blue 'Add Node' button is present. A green message box at the bottom indicates: 'http://localhost:3550 successfully added'.

You can see new node is added to chain:

The screenshot shows the 'Connected Nodes' section of the application. It lists two nodes: 'localhost:1550' and 'localhost:3550', each with a small 'X' icon to its right.

### Charlie's Dashboard after adding to current network:

Charlies Chain ID is now synced with Alice network and both nodes are connected to share information.

The screenshot shows a web-based blockchain dashboard titled "Kings Blockchain Project". At the top, there are four navigation buttons: "Faucet", "Wallet", "Block Explorer", and "Mining Console".

The main section is titled "Blockchain Information" and displays the following data:

Chain ID	<b>1f8abb338d8ec021</b>
Node ID	<b>30bc9905fd61769f</b>
Started on	<b>Saturday, March 2nd, 2019, 12:58:10 PM</b>
Length	<b>1</b>
Nodes connected	<b>2</b>
Confirmed Transactions	<b>0</b>
Pending Transactions	<b>2</b>
Difficulty	<b>4</b>
Nonce	<b>10001</b>

Below this, there is a form titled "Add New Node" with fields for "Host ID" (localhost) and "Port #" (5550), and a blue "Add Node" button.

### Charlie running mining Job:

We can notice, the 2 transactions triggered by Alice and Bob are still in pending transactions. Miner has to mine the transactions after validating it.

The screenshot shows a web-based blockchain dashboard titled "Kings Blockchain Project". The main section is titled "Blockchain Information" and displays the following data:

Chain ID	<b>1f8abb338d8ec021</b>
Node ID	<b>30bc9905fd61769f</b>
Started on	<b>Saturday, March 2nd, 2019, 12:58:10 PM</b>
Length	<b>1</b>
Nodes connected	<b>2</b>
Confirmed Transactions	<b>0</b>
Pending Transactions	<b>2</b>
Difficulty	<b>4</b>
Nonce	<b>10001</b>

## Requesting for Mining:

Charlie requesting mining job information from Alice's Node with his Reward Wallet address. If the block is successfully mined the reward and transaction fees are credited to Charlies Wallet address.

The screenshot shows a web-based mining application. At the top, it says "Mining". Below that is a "Home" button. The main area has two sections: "Request for Mining" and "Received Data".

**Request for Mining:**

- Node Hostname: localhost:1550
- Reward Address: 0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
- Request Job button

Mining Started, Block will be added once completed.. !! x

**Received Data:**

	Received Data
Index	1
TransactionIncluded	2
ExpectedReward	11
RewardAddress	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
BlockDataHash	60f892a3df7c3a5c8b6ae8555d33d48e02fde184373136a2aa5f679705206a64
Nonce	10001

New Block successfully mined by Charlie and added to Chain:

The screenshot shows a "Blockchain Information" page with the following data:

Blockchain Information	
Chain ID	1f8abb338d8ec021
Node ID	b7e357bef35b157a
Started on	Saturday, March 2nd, 2019, 12:58:10 PM
Length	2
Nodes connected	2
Confirmed Transactions	5
Pending Transactions	0
Difficulty	4
Nonce	10002

We can click the Chain Length to see newly added block information with Block proof hex and signature

Blocks# 1	
<input type="text" value="Enter Block# or Transaction# to search"/> <input type="button" value="Search"/>	
<b>Index</b>	1
<b>TimeStamp</b>	Saturday, March 2nd, 2019, 1:23:29 PM
<b>Datenow</b>	1551504209552
<b>PreviousBlockHash</b>	2806882a7fa78270cafd0122f6661bf672d7d9dbc8d2c67e10d945724337d3fa
	<b>id :</b> 3db3db3e6786ef3b4008189eeb110307 sender : 0xa0F2E777FFd73E3158c4a979b266A57840FE69F7 receiver : 0xaas5FF1101a7034BffSA1099200BF3cC92fDdcCa3 amount : 10 txreward : 0 description : Giving Away Coin timestamp : Saturday, March 2nd, 2019, 1:02:54 PM datenow : 1551502974061 signature : 0x25bc8de0aa26c5ba9d9e5a1f064f01080732117f21d495217a610c1e6f436a6 7263d14487e5ed3b977c4ca0658cb0d436982d8e8f3524df2046ec55d6ef7c5d e1c minedBlock : 1 <b>id :</b> 6beb5365ee0ed75295538d45ed76e53 sender : 0xa0F2E777FFd73E3158c4a979b266A57840FE69F7 receiver : 0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0 amount : 10 txreward : 0 description : Giving Away Coin timestamp : Saturday, March 2nd, 2019, 1:08:50 PM datenow : 155150330420 signature : 0xa3924f27812c796edae16867d70d399e9d64977b8007fdea34a0167c73eb25 c42258ea8f37bd42a4d65a91c2ccb50413be619a25cb4f31bb8a16fd64c07ad 0a1b minedBlock : 1 <b>id :</b> 4f3c79c8207a06850977571f6bb39d8e sender : 0xa0F2E777FFd73E3158c4a979b266A57840FE69F7 receiver : 0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496 amount : 0.5 txreward : 0 description : Coin Base Transaction for ID: 3db3db3e6786ef3b4008189eeb110307 timestamp : Saturday, March 2nd, 2019, 1:23:28 PM datenow : 1551504208993 signature : No-Sign minedBlock : 1 <b>id :</b> c824b27ed549381fa33865b8794fd2bb sender : 0xa0F2E777FFd73E3158c4a979b266A57840FE69F7 receiver : 0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496 amount : 0.5 txreward : 0 description : Coin Base Transaction for ID: 6beb5365ee0ed75295538d45ed76e53 timestamp : Saturday, March 2nd, 2019, 1:23:28 PM datenow : 1551504208993 signature : No-Sign minedBlock : 1 <b>id :</b> d476fe8c14b7369563900a407e6c760f sender : 0x000 receiver : 0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496 amount : 10 txreward : 0 description : Coin Base Transaction Block Reward timestamp : Saturday, March 2nd, 2019, 1:23:28 PM datenow : 1551504208994 signature : No-Sign minedBlock : 1
<b>Proof</b>	12618
<b>ProofHex</b>	0000e76ba1272c06ebaf24d2ddd8b72e1794c327bc1f6e8abdbc4ce190e0561
<b>Nonce</b>	10001
<b>Confirmations</b>	1
<b>Hash</b>	51d7d11bfc29a2441eecc2805062b643ceeb732c3f76cf4d6668b44a738882b3
<input type="button" value="Previous"/>	

### Alice's Current Balance:

Wallet Information	
Address	oxaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3
SafeBalance	0
ConfirmedBalance	10
PendingBalance	0

### Bob's Current Balance:

Wallet Information	
Address	0xF4AA21d14526297Af26B34785D3E1B46e7Cofedo
SafeBalance	0
ConfirmedBalance	10
PendingBalance	0

### Charlie's Current Balance:

Wallet Information	
Address	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
SafeBalance	0
ConfirmedBalance	11
PendingBalance	0

Note: Charlie earned this coins by mining which includes mining reward and transaction fees.  
( Reward = 10; Transaction fees  $5\% = 20 * 5\% = 1$ ; Total =  $10 + 1$ ; )

## Activity – 06 :

Charlie sending 5 coins to David ( Current Balance: David = 0; Charlie = 11 )

### Wallet Addresses:

Charlie	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
David	0xdb87fd8098D081aE2613C00172CBdABb5c11Cae3

**Send Coin**

Sender	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
Receiver	0xdb87fd8098D081aE2613C00172CBdABb5c11Cae3
Amount	5 Fee 5%: 0.25
Miners Reward	0.2
Description	Charlie Sending 5 coins to David
<b>Send</b>	

We can notice transaction is created and current balance is -5 for Charlie because he is sending to Bob

**Wallet Information**

Address	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
SafeBalance	0
ConfirmedBalance	11
PendingBalance	-5

**Send Coin**

Sender	0xOMEAU9RM2367lvsaa726U904cD6397eJKcAe6068Y
Receiver	0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D
Amount	0 Fee 5%:
Miners Reward	Additional Miners Reward
Description	Enter transaction note here
<b>Send</b>	

Transaction successfully sent ID: 0024e15bb15ad05dc0939817b33dff43 x

Transaction is signed by Charlie and signature is added to the transaction information:

<b>Id</b>	0024e15bb15ad05dc0939817b33dff43
<b>Sender</b>	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
<b>Receiver</b>	0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3
<b>Amount</b>	5
<b>Txreward</b>	0.2
<b>Description</b>	Charlie Sending 5 coins to David
<b>Timestamp</b>	Saturday, March 2nd, 2019, 2:01:10 PM
<b>Datenow</b>	1551506470783
<b>Signature</b>	0x4f89d0c2639a3e76d3eaf12c4f96b534fbb184a18b6e4e0895b62355b4ace7494f6fff5d78f0417163e851c92f4b6927117e3e9fbaf0912668d1104e4f3f5fa61c
<b>MinedBlock</b>	<a href="#">2</a>

## Activity – 07:

David is Joining the Node (port = 4550) and activating mining

```
MacBook-Pro:Kingsland-Blockchain-2018-Group2-Project jkumarsv$ nodemon main.js --port=4550 --mining=yes
[nodemon] 1.18.10
[nodemon] to restart at any time, enter `rs`
[nodemon] watching: ***!
[nodemon] starting `node main.js --port=4550 --mining=yes`
Is blockchain valid?true
localhost:4550 is added
Living at URL http://localhost:4550
2019-03-02 13:44:40 info : 4550: Chain Living at URL http://localhost:4550
2019-03-02 13:44:40 info : 4550: Socket connected, ID q_bvRz-gZWm4FGk4AAAA
```

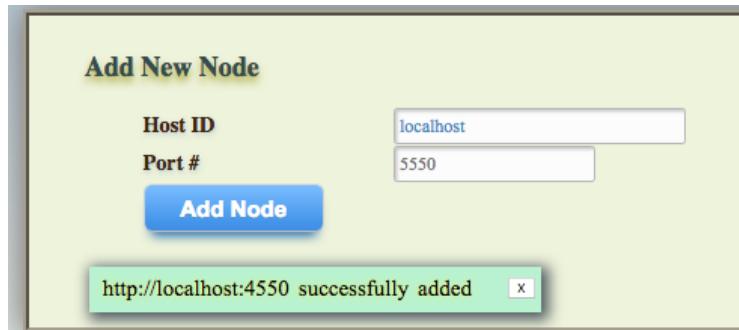
### David Node Dashboard:

Before Joining to existing nodes:

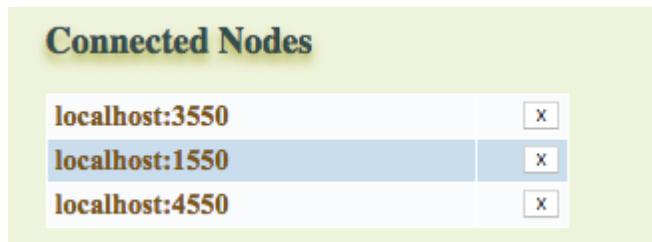
### Blockchain Information

Chain ID	f23f12de2abe238f
Node ID	d4713666eeab2175
Started on	Saturday, March 2nd, 2019, 1:44:39 PM
Length	1
Nodes connected	1
Confirmed Transactions	0
Pending Transactions	0
Difficulty	4
Nonce	10001

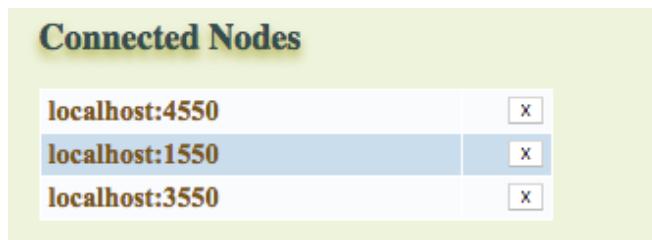
David Joining to Charlies Node:



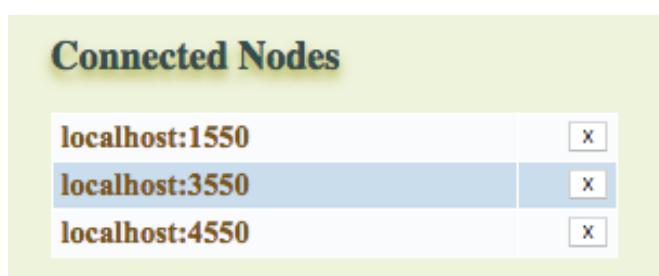
Nodes connected in Charlies Dashboard:



David's Dashboard:



Alice's Dashboard:



All the current nodes in the networks are synced together to communicate and share data.

### David Requesting for mining Job:

Provided the host to provide mining candidate and Reward wallet address

#### Pending Transactions

<b>Id</b>	0024e15bb15ad05dc0939817b33dff43
<b>Sender</b>	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
<b>Receiver</b>	0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3
<b>Amount</b>	5
<b>Txreward</b>	0.2
<b>Description</b>	Charlie Sending 5 coins to David
<b>Timestamp</b>	Saturday, March 2nd, 2019, 2:01:10 PM
<b>Datenow</b>	1551506470783
<b>Signature</b>	0x4f89d0c2639a3e76d3eaf12c4f96b534fb184a18b6e4e0895b62355b4ace7494f6fff5d78f0417 163e851c92f4b6927117e3c9fbaf0912668d1104e4f3f5fa61c

#### Request for Mining

Node Hostname: localhost:4550  
Reward Address: 0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3

**Request Job**

Mining Started, Block will be added once completed.. !! X

#### Received Data

Index	2
TransactionIncluded	1
ExpectedReward	10.45
RewardAddress	0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3
BlockDataHash	b28c94b2195c8ed259fob415aaee3f39bob2920a4537611499fao44956917a21
Nonce	10003

#### Block is mined and added to chain:

We can verify it from the Block chain Logger file

File is under: /Kingsland-Blockchain-2018-Group2-Project/log/Chainlogger.log

```
2019-03-02 14:01:10 info: 4550: Transaction id 0024e15bb15ad05dc0939817b33dff43 signature  
0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496 validated  
2019-03-02 14:02:30 info: 4550: Mined Successfully  
2019-03-02 14:02:30 info: 4550: Block validated and added to chain  
2019-03-02 14:02:30 info: 1550: New Block added ID: 2  
2019-03-02 14:02:30 info: 3550: New Block added ID: 2  
2019-03-02 14:02:30 info: 4550: New Block added ID: 2
```

### Newly added Block Information:

Blocks# 2	
<input type="text" value="Enter Block# or Transaction# to search"/> <input type="button" value="Search"/>	
<b>Index</b>	2
<b>TimeStamp</b>	Saturday, March 2nd, 2019, 2:02:30 PM
<b>Datenow</b>	1551506550503
<b>PreviousBlockHash</b>	51d7d11bfc29a2441eccc2805062b643ceeb732c3f76cf4d6668b44a738882b3 <a href="#">id : 0024e15bb15ad05dc0939817b33dff43</a> sender : 0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496 receiver : 0xB87fd8098D081aE2613C00172CBdABb5c11Cae3 amount : 5 txreward : 0.2 description : Charlie Sending 5 coins to David timestamp : Saturday, March 2nd, 2019, 2:01:10 PM datenow : 1551506470783 signature : 0x4f89d0c2639a3e76d3eaf12c4f96b534fbb184a18b6e4e0895b62355b4ace74 94f6fff5d78f0417163e851c92f4b6927117e3c9fbaf0912668d1104e4f3f5fa61c minedBlock : 2 <a href="#">id : 7a5f20fd44a807f3536897464971c042</a> sender : 0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496 receiver : 0xB87fd8098D081aE2613C00172CBdABb5c11Cae3 amount : 0.45 txreward : 0 description : Coin Base Transaction for ID: 0024e15bb15ad05dc0939817b33dff43 timestamp : Saturday, March 2nd, 2019, 2:02:26 PM datenow : 1551506546328 signature : No-Sign minedBlock : 2 <a href="#">id : 1deb98ebdf5b279f61a1bc31f6f1251d</a> sender : 0x00 receiver : 0xB87fd8098D081aE2613C00172CBdABb5c11Cae3 amount : 10 txreward : 0 description : Coin Base Transaction Block Reward timestamp : Saturday, March 2nd, 2019, 2:02:26 PM datenow : 1551506546328 signature : No-Sign minedBlock : 2
<b>Data</b>	
<b>Proof</b>	77941
<b>ProofHex</b>	00000408a061f5f94a665ed1b63eb709d94390bc7a09f50a6e7b3402ba6677d4
<b>Nonce</b>	10003
<b>Confirmations</b>	1

Block is mined and reward is distributed to miner.

**Current Balance:**

**Alice:**

**Wallet Information**

Address	<b>0xa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3</b>
SafeBalance	<b>0</b>
ConfirmedBalance	<b>10</b>
PendingBalance	<b>0</b>

**Bob:**

**Wallet Information**

Address	<b>0xF4AA21d14526297Af26B34785D3E1B46e7Cofedo</b>
SafeBalance	<b>0</b>
ConfirmedBalance	<b>10</b>
PendingBalance	<b>0</b>

**Charlie:**

**Wallet Information**

Address	<b>0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496</b>
SafeBalance	<b>0</b>
ConfirmedBalance	<b>5.55</b>
PendingBalance	<b>0</b>

**David:**

**Wallet Information**

Address	<b>0xB87fd8098D081aE2613C00172CBdABb5c11Cae3</b>
SafeBalance	<b>0</b>
ConfirmedBalance	<b>15.45</b>
PendingBalance	<b>0</b>

## Activity = 07:

Elvis requesting trying to send some coins to Bob.

Elvis current balance is 0 so system will not allow to send coins:

**Wallet Information**

Address	0x35c737abaA242e94795F1354FCA1EFA0D266F238
SafeBalance	0
ConfirmedBalance	0
PendingBalance	0

New Wallet created from Private key provided  
0xbe645fdec284192508f8af9c2b6ab207fdb79b2cdeadad0c973e6fa8717a669a x

---

**Send Coin**

Sender	0x35c737abaA242e94795F1354FCA1EFA0D266F238
Receiver	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
Amount	100 <small>Fee 5%: 5</small>
Miners Reward	0.5
Description	Elvis sending 100 Coins to Bob

**Send**

Got insufficient Balance error

Insufficient Safe balance, you have only "0" Coins !! x

### 1. Elvis requesting coins from Faucet:

**Faucet Status**

Address	0xa0F2E777Ffd73E3158c4a979b266A57840FE69F7
Balance	39999979

---

**Receive Coin**

Address	0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D
---------	--

**Receive Coin**

10 Free Coins Sent Successfully to 0x35c737abaA242e94795F1354FCA1EFA0D266F238 x

## 2. Alice is send 8 coins to Elvis

**Wallet Information**

Address	oxaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3
SafeBalance	0
ConfirmedBalance	10
PendingBalance	0

New Wallet created from Private key provided  
0x3802817c79c18fb5e49cdf0d38ab5044c68eb00fd130a25b3b68f5624062e897

**Send Coin**

Sender	0xaaf5FF1101a7034Bff5A1099200BF3cC92fDdcCa3
Receiver	0x35c737abaA242e94795F1354FCA1EFA0D266F238
Amount	8 <small>Fee 5%: 0.4</small>
Miners Reward	0.5
Description	Alice Sending 8 coins to Elvis

**Send**

Transaction successfully sent ID: 92edc726f5956989441b88637711ad71

We can see 2 pending transactions in the Dashboard:

**Blockchain Information**

Chain ID	1f8abb338d8ec021
Node ID	b7e357bef35b157a
Started on	Saturday, March 2nd, 2019, 12:58:10 PM
Length	3
Nodes connected	3
Confirmed Transactions	13
Pending Transactions	2
Difficulty	4
Nonce	10004

## Activity – 08:

David running mining Job

**Request for Mining**

Node Hostname	localhost:4550
Reward Address	0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3

**Request Job**

Mining Started, Block will be added once completed.. !! X

**Received Data**

Index	3
TransactionIncluded	2
ExpectedReward	11.4
RewardAddress	0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3
BlockDataHash	60f892a3df7c3a5c8b6ae8555d33d48eo2fde184373136a2aa5f679705206a64
Nonce	10004

Block is added to chain

```
2019-03-02 14:37:39 info: 1550: Transaction ID92edc726f5956989441b88637711ad71 and  
broadcasted  
2019-03-02 14:37:39 info: 4550: Transaction Id 92edc726f5956989441b88637711ad71 signature  
0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3 validated  
2019-03-02 14:37:39 info: 3550: Transaction Id 92edc726f5956989441b88637711ad71 signature  
0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3 validated  
2019-03-02 14:37:39 info: 1550: Transaction Id 92edc726f5956989441b88637711ad71 signature  
0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3 validated  
2019-03-02 14:39:31 info: 4550: Mined Successfully  
2019-03-02 14:39:31 info: 4550: Block validated and added to chain  
2019-03-02 14:39:31 info: 3550: New Block added ID: 3  
2019-03-02 14:39:31 info: 1550: New Block added ID: 3  
2019-03-02 14:39:31 info: 4550: New Block added ID: 3
```

## Current Balance:

Alice:

### Wallet Information

Address	oxaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3
SafeBalance	0
ConfirmedBalance	1.1
PendingBalance	0

Bob:

### Wallet Information

Address	0xF4AA21d14526297Af26B34785D3E1B46e7Cofedo
SafeBalance	0
ConfirmedBalance	10
PendingBalance	0

Charlie:

### Wallet Information

Address	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
SafeBalance	0
ConfirmedBalance	5.55
PendingBalance	0

David:

### Wallet Information

Address	0xdB87fd8098D081aE2613C00172CBdABb5c11Cae3
SafeBalance	0
ConfirmedBalance	26.849999999999998
PendingBalance	0

Elvis:

( 10 Coins from Faucet and 8 Coins from Alice )

### Wallet Information

Address	0x35c737abaA242e94795F1354FCA1EFAoD266F238
SafeBalance	0
ConfirmedBalance	18
PendingBalance	0



### Faucet Home:

A screenshot of the Kings Faucet website. At the top, there's a blue header bar with a "Home" button. Below it, a yellow box displays "Faucet Status" with two entries: "Address" (oxaoF2E777Ffd73E3158c4a979b266A57840FE69F7) and "Balance" (39999968.5). Underneath this is another yellow box titled "Receive Coin" containing an "Address" input field with the value 0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D and a blue "Receive Coin" button. The background of the main content area is light blue.

Users can provide their wallet address and get 10 Free Coins.

#### 1. Alice is requesting 10 coins:

A screenshot of the "Receive Coin" page. It shows an "Address" input field with the value 0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D and a blue "Receive Coin" button. Below the button, a green message box states "10 Free Coins Sent Successfully to 0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3" with a close button (X).

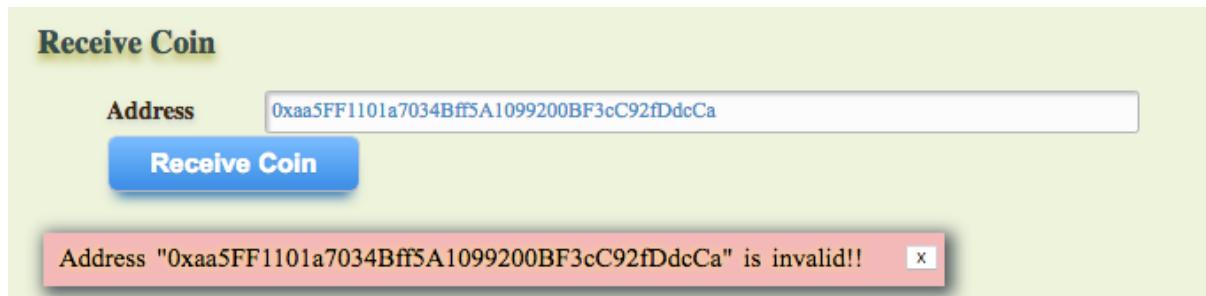
#### 2. Alice is trying to request another 10 coins immediately :

And her request is not successful with error message

A screenshot of the "Receive Coin" page. It shows an "Address" input field with the value 0xaa5FF1101a7034Bff5A1099200BF3cC92fDdcCa3 and a blue "Receive Coin" button. Below the button, a red message box states "Please wait for an hour to get your next coins..Freee..!!" with a close button (X).

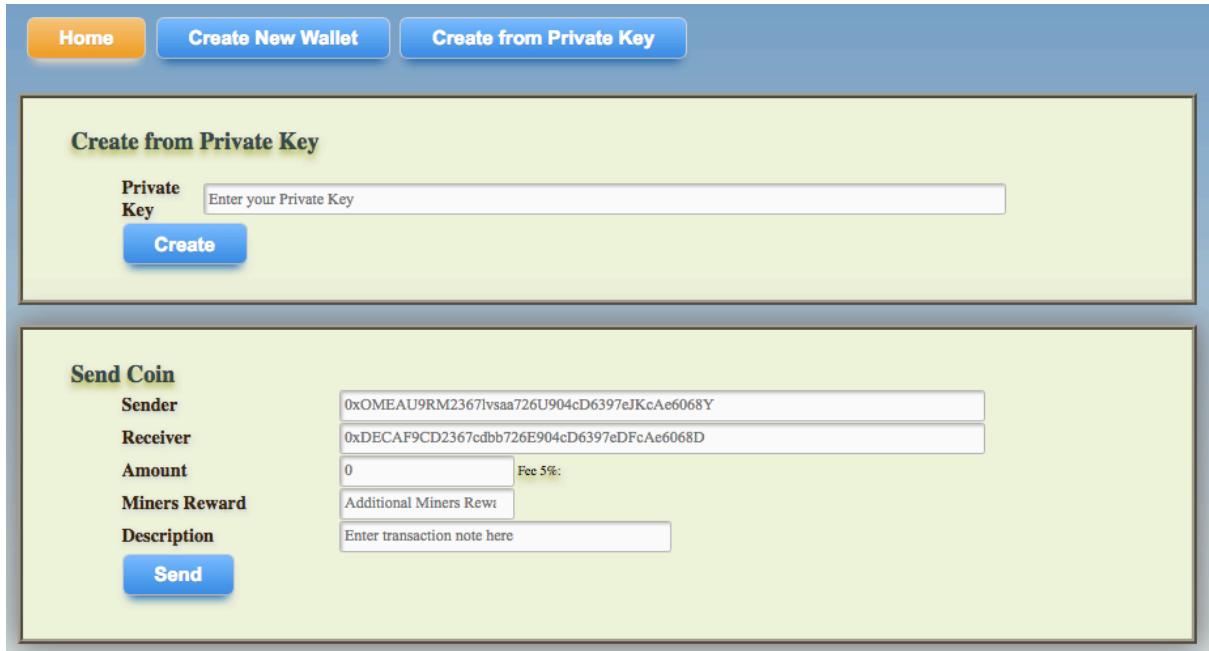
**3. Alice wrongly provided her address and trying to request:**

And got invalid error message



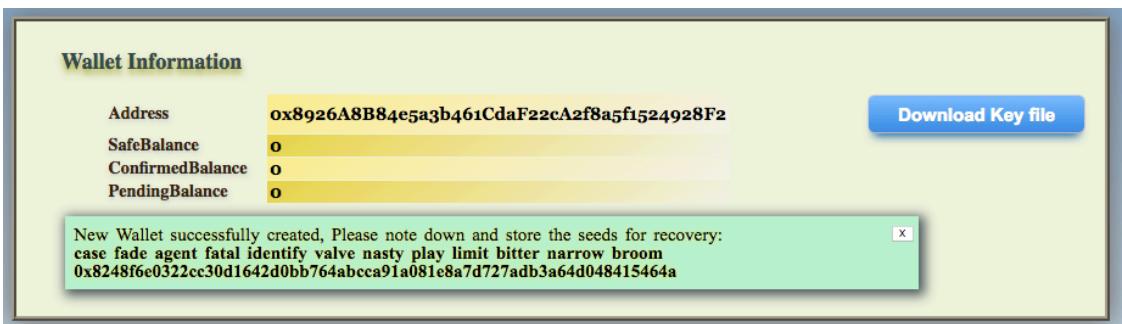
# Kings Wallet

## Wallet Home:



The screenshot shows the Kings Wallet home page. At the top, there are three buttons: "Home" (orange), "Create New Wallet" (blue), and "Create from Private Key" (blue). Below these, there are two main sections. The first section, titled "Create from Private Key", has a "Private Key" input field containing placeholder text "Enter your Private Key" and a "Create" button. The second section, titled "Send Coin", contains fields for "Sender" (0xOMEAU9RM2367lvsaa726U904cD6397eJKcAe6068Y), "Receiver" (0xDECAF9CD2367cdbb726E904cD6397eDFcAe6068D), "Amount" (0 with a note "Fee 5%"), "Miners Reward" (Additional Miners Rewi), and "Description" (Enter transaction note here). A "Send" button is located at the bottom of this section.

1. User can create new wallet and receive seed and private key by Clicking Create New Wallet Button



The screenshot shows a "Wallet Information" panel. It displays the address "ox8926A8B84e5a3b461CdaF22cA2f8a5f1524928F2", safe balance "0", confirmed balance "0", and pending balance "0". A "Download Key file" button is available. A green message box at the bottom states: "New Wallet successfully created, Please note down and store the seeds for recovery: case fade agent fatal identify valve nasty play limit bitter narrow broom 0x8248f6e0322cc30d1642d0bb764abcca91a081e8a7d727adb3a64d048415464a".

2. User can login using private key and see his/her balance by Clicking Create from Private Key Button



The screenshot shows the "Create from Private Key" section. It has a "Private Key" input field containing placeholder text "0x40433a49b442904f967207881af9ec119b6388edad43edb57b00fe979e2f4126" and a "Create" button.

**Wallet Information**

Address	0xF4AA21d14526297Af26B34785D3E1B46e7Cofedo	<a href="#">Download Key file</a>
SafeBalance	0	
ConfirmedBalance	10	
PendingBalance	0	

New Wallet created from Private key provided  
0x40433a49b442904f967207881af9ee119b6388edad43edb57b00fe979e2f4126

And can use the Download Key File Button to download the Encrypted Wallet Information in JSON format



### File Content with JSON format

```

{
  address: "f4aa21d14526297af26b34785d3e1b46e7c0fed0",
  id: "3e9f02c6-bf6d-4b93-b75a-f0cf9039ca6d",
  version: 3,
  - Crypto: {
      cipher: "aes-128-ctr",
      - cipherparams: {
          iv: "7cea9375e1827aef799e3fd707d9f602"
        },
      ciphertext: "0ac1b53e32153542796f2268a5098cea709802254cbef3d3611d3e73fec84350",
      kdf: "scrypt",
      - kdfparams: {
          salt: "55536c64a6ca070c500e77805f4b8e8c62ac759c41c91a1654a6d5f2d2ef3fe1",
          n: 131072,
          dklen: 32,
          p: 1,
          r: 8,
        },
      mac: "fa2caf2f02cf41d91a974e4711417257c148bd3592f3ee0110fad8c430b7642a",
    },
}

```

### 3. Bob is trying to send to wrong address

And got error message

**Send Coin**

Sender	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
Receiver	0x7Af5be4a5A1b708fab78196a781816A66203629
Amount	2 Fee 5%:
Miners Reward	Additional Miners Rewr
Description	Wrong Receiver address

[Send](#)

Receiver address "0x7Af5be4a5A1b708fab78196a781816A66203629" is invalid!!

#### 4. Bob is trying to send negative amount to receiver

Transaction is failed with error message

**Send Coin**

Sender	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
Receiver	0x7Af5be4a5A1b708fab78196a781816A66203629D
Amount	-2 Fee 5%:
Miners Reward	Additional Miners Reward
Description	Sending negative amount

**Send**

Amount cannot be "0" or lesser!! x

#### 5. Bob is trying to send negative Reward amount

Transaction is failed with error message

**Send Coin**

Sender	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
Receiver	0x7Af5be4a5A1b708fab78196a781816A66203629D
Amount	2 Fee 5%:
Miners Reward	Additional Miners Reward
Description	Sending negative amount

**Send**

Reward cannot be "0" or lesser :( x

#### 6. Bob is send more than what he has in his account

Transaction is failed with error message

**Wallet Information**

Address	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
SafeBalance	0
ConfirmedBalance	10
PendingBalance	0

**Send Coin**

Sender	0xF4AA21d14526297Af26B34785D3E1B46e7C0fed0
Receiver	0x7Af5be4a5A1b708fab78196a781816A66203629D
Amount	100 Fee 5%:
Miners Reward	Additional Miners Reward
Description	Sending negative amount

**Send**

Insufficient Safe balance, you have only "10" Coins !! x

# Block Explorer

Block Explorer helps to search for Block details. We can search based on Block # or Transaction #.

## 1. Searching using Block #

Enter Block number in the provided search box and press Search Button

The screenshot shows a search interface for a blockchain block. At the top, there is a search bar with the placeholder "Enter Block# or Transaction# to search" and a blue "Search" button. Below the search bar is a table containing the details of the block. The table has two columns: "Index" and "Data". The "Index" column contains the value "0". The "Data" column contains several fields: "TimeStamp" (Saturday, March 2nd, 2019, 12:58:10 PM), "Datenow" (1551502690215), "PreviousBlockHash" (0x00), "id" (c60e6180448b5de548eb7f01436924b6), "sender" (0x00), "receiver" (0xa0F2E777Fd73E3158c4a979b266A57840FE69F7), "amount" (40000000), "txreward" (0), "description" (Kings Genesis Block), "timestamp" (Saturday, March 2nd, 2019, 12:58:10 PM), "datenow" (1551502690215), and "signature" (No-Sign). There is also a "Proof" field with the value "0" and a "ProofHex" field which is empty. The "Nonce" field has the value "10000" and the "Confirmations" field has the value "1". The "Hash" field contains the value 2806882a7fa78270cafd0122f6661bf672d7d9dbc8d2c67e10d945724337d3fa. At the bottom right of the table area is a blue "Next" button.

Blocks#	
Index	0
TimeStamp	Saturday, March 2nd, 2019, 12:58:10 PM
Datenow	1551502690215
PreviousBlockHash	0x00
	<b>id : c60e6180448b5de548eb7f01436924b6</b> sender : 0x00 receiver : 0xa0F2E777Fd73E3158c4a979b266A57840FE69F7 amount : 40000000 txreward : 0 description : Kings Genesis Block timestamp : Saturday, March 2nd, 2019, 12:58:10 PM datenow : 1551502690215 signature : No-Sign
Proof	0
ProofHex	
Nonce	10000
Confirmations	1
Hash	2806882a7fa78270cafd0122f6661bf672d7d9dbc8d2c67e10d945724337d3fa

**2. Enter Transaction number in the search box and press search**

**Blocks# 3**

**Transaction# d76578a4356665f39c4ddffc33a92042**

Enter Block# or Transaction# to search		Search
<b>Id</b>	d76578a4356665f39c4ddffc33a92042	
<b>Sender</b>	0xa0F2E777Ffd73E3158c4a979b266A57840FE69F7	
<b>Receiver</b>	0x35c737abaA242e94795F1354FCA1EFA0D266F238	
<b>Amount</b>	10	
<b>Txreward</b>	0	
<b>Description</b>	Giving Away Coin	
<b>Timestamp</b>	Saturday, March 2nd, 2019, 2:35:25 PM	
<b>Datenow</b>	1551508525015	
<b>Signature</b>	0xa2b7676e871b355120de0b1d4e993a7cb7511e716ae8750a7c890366f48b5831300ce5d768f2dfe95 168cc241d964fc6a8510782d755b5d4178330ec03d648bf1b	
<b>MinedBlock</b>	<a href="#">3</a>	

**Previous**

# Mining

In Mining Console User can request for current mining candidate using the Node hostname and Miner's Address for Reward to be sent.

1. Provide Node Hostname with Port and Miner's Wallet address and press Request Job

Node will provide the Mining candidate with Transaction count and Block Data Hash To mine.

The screenshot shows the Mining Console interface. At the top, there is a navigation bar with a 'Home' button. Below it, the 'Request for Mining' section contains fields for 'Node Hostname' (localhost:1550) and 'Reward Address' (0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496), and a blue 'Request Job' button. In the 'Received Data' section, there is a table with the following data:

Index	1
TransactionIncluded	2
ExpectedReward	11
RewardAddress	0xd65445daD9DAc4344345Ad9Db1959A919c4Aa496
BlockDataHash	60f892a3df7e3a5c8b6ae8555d33d48e02fde184373136a2aa5f679705206a64
Nonce	10001

# End