

Note : I have created 2 folders in main “Course2_Assignment_MartandKulkarni”, “property-registration” and “property-registration_Local”.

- property-registration : Folder you provided with provided network settings where I added my chaincode folder.
- property-registration_Local : As I had network setup on my MAC localhost, I have made changes to network configuration to have it working. Hence this folder contains all the changes to network folder with my chaincode that worked in my localhost OS
- Alignment of code with indentation is properly formatted and same is visible in VS editor.

The command to bootstrap the network,

Command : sh fabricNetwork.sh up

Screenshots:

```
m0k01h7@m-c02w719xhtd5 network % pwd
/Users/m0k01h7/OneDrive - Walmart Inc/Docs/Adhoc/JS/Fabric/property-registration
m0k01h7@m-c02w719xhtd5 network % sh fabricNetwork.sh up
Starting for channel 'registrationchannel' with CLI timeout of '15' seconds and
Continue? [Y/n]
proceeding ...
Unable to find image 'hyperledger/fabric-tools:latest' locally
docker: Error response from daemon: manifest for hyperledger/fabric-tools:lates
See 'docker run --help'.
LOCAL_VERSION=1.4.3
DOCKER_IMAGE_VERSION=
===== WARNING =====
  Local fabric binaries and docker images are
  out of sync. This may cause problems.
=====
/Users/m0k01h7/OneDrive - Walmart Inc/Docs/Adhoc/JS/Fabric/property-registration

#####
##### Generate certificates using cryptogen tool #####
#####
+ cryptogen generate --config=./crypto-config.yaml
registrar.property-registration-network.com
users.property-registration-network.com
+ res=0
+ set +x

/Users/m0k01h7/OneDrive - Walmart Inc/Docs/Adhoc/JS/Fabric/property-registration
#####
##### Generating Orderer Genesis block #####
#####
+ configtxgen -profile OrdererGenesis -channelID upgrad-sys-channel -outputBlock
2021-07-29 17:05:42.532 IST [common.tools.configtxgen] main -> INFO 001 Loading
2021-07-29 17:05:42.567 IST [common.tools.configtxgen.localconfig] completeInit
2021-07-29 17:05:42.567 IST [common.tools.configtxgen.localconfig] Load -> INFO
2021-07-29 17:05:42.583 IST [common.tools.configtxgen.localconfig] completeInit
2021-07-29 17:05:42.583 IST [common.tools.configtxgen.localconfig] LoadTopLevel
2021-07-29 17:05:42.593 IST [common.tools.configtxgen] doOutputBlock -> INFO 00
2021-07-29 17:05:42.594 IST [common.tools.configtxgen] doOutputBlock -> INFO 00
+ res=0
+ set +x

#####
### Generating channel configuration transaction 'channel.tx' ###
#####
+ configtxgen -profile RegistrationChannel -outputCreateChannelTx ./channel-art
2021-07-29 17:05:42.645 IST [common.tools.configtxgen] main -> INFO 001 Loading
2021-07-29 17:05:42.664 IST [common.tools.configtxgen.localconfig] Load -> INFO
2021-07-29 17:05:42.680 IST [common.tools.configtxgen.localconfig] completeInit
2021-07-29 17:05:42.680 IST [common.tools.configtxgen.localconfig] LoadTopLevel
2021-07-29 17:05:42.680 IST [common.tools.configtxgen] doOutputChannelCreateTx
2021-07-29 17:05:42.680 IST [common.tools.configtxgen.encoder] NewChannelGroup
2021-07-29 17:05:42.699 IST [common.tools.configtxgen.encoder] NewChannelGroup
2021-07-29 17:05:42.713 IST [common.tools.configtxgen] doOutputChannelCreateTx
+ res=0
+ set +x

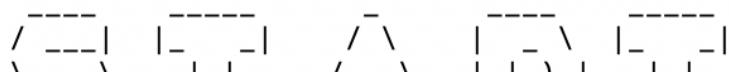
#####
##### Generating anchor peer update for registrarMSP #####
#####
```



```
+ res=0
+ set +x

#####
##### Generating anchor peer update for usersMSP #####
#####
+ configtxgen -profile RegistrationChannel -outputAnchorPeersUpdate ./channel-an
2021-07-29 17:05:42.829 IST [common.tools.configtxgen] main -> INFO 001 Loading
2021-07-29 17:05:42.842 IST [common.tools.configtxgen.localconfig] Load -> INFO
2021-07-29 17:05:42.854 IST [common.tools.configtxgen.localconfig] completeInit
2021-07-29 17:05:42.854 IST [common.tools.configtxgen.localconfig] LoadTopLevel
2021-07-29 17:05:42.854 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate
2021-07-29 17:05:42.854 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate
+ res=0
+ set +x

Creating network "network_registration" with the default driver
Creating volume "network_orderer.property-registration-network.com" with default
Creating volume "network_peer0.registrar.property-registration-network.com" with de
Creating volume "network_peer1.registrar.property-registration-network.com" with de
Creating volume "network_peer0.users.property-registration-network.com" with de
Creating volume "network_peer1.users.property-registration-network.com" with de
Creating volume "network_peer2.users.property-registration-network.com" with de
Creating ca.users.property-registration-network.com ... done
Creating orderer.property-registration-network.com ... done
Creating peer1.users.property-registration-network.com ... done
Creating peer0.users.property-registration-network.com ... done
Creating chaincode ... done
Creating peer2.users.property-registration-network.com ... done
Creating peer0.registrar.property-registration-network.com ... done
Creating ca.registrar.property-registration-network.com ... done
Creating peer1.registrar.property-registration-network.com ... done
Creating cli ... done
CONTAINER ID IMAGE COMMAND CREA
63d70ad6cfa0 hyperledger/fabric-tools:1.4.9 "/bin/bash" 1 se
d07d5cc54447 hyperledger/fabric-peer:1.4.9 "peer node start --p..." 5 se
istration-network.com
addfdd436d43 hyperledger/fabric-ca:1.4.9 "sh -c 'fabric-ca-se..." 5 se
ration-network.com
f2a1468c55f7 hyperledger/fabric-orderer:1.4.3 "orderer" 5 se
n-network.com
8a9b9ff5c137 hyperledger/fabric-peer:1.4.9 "peer node start --p..." 5 se
istration-network.com
704b4a3b5a03 hyperledger/fabric-ccenv:1.4.9 "/bin/bash -c 'sleep..." 5 se
c253c9481161 hyperledger/fabric-peer:1.4.9 "peer node start --p..." 5 se
ation-network.com
11654e7c1d53 hyperledger/fabric-peer:1.4.9 "peer node start --p..." 5 se
ation-network.com
fabf171f6193 hyperledger/fabric-peer:1.4.9 "peer node start --p..." 5 se
ation-network.com
216469bdcf79 hyperledger/fabric-ca:1.4.9 "sh -c 'fabric-ca-se..." 5 se
on-network.com
Sleeping 10s to allow cluster to complete booting
```





```
+ res=0
+ set +x
2021-07-29 11:36:01.636 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:01.671 UTC [cli.common] readBlock -> INFO 002 Received block:
===== Channel 'registrationchannel' created =====

Having all peers join the channel...
+ peer channel join -b registrationchannel.block
+ res=0
+ set +x
2021-07-29 11:36:01.765 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:01.797 UTC [channelCmd] executeJoin -> INFO 002 Successfully s
===== peer0.registrar.registration-network.com joined channel

+ peer channel join -b registrationchannel.block
+ res=0
+ set +x
2021-07-29 11:36:06.909 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:06.942 UTC [channelCmd] executeJoin -> INFO 002 Successfully s
===== peer1.registrar.registration-network.com joined channel

+ peer channel join -b registrationchannel.block
+ res=0
+ set +x
2021-07-29 11:36:12.081 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:12.110 UTC [channelCmd] executeJoin -> INFO 002 Successfully s
===== peer0.users.registration-network.com joined channel 'reg

+ peer channel join -b registrationchannel.block
+ res=0
+ set +x
2021-07-29 11:36:17.194 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:17.229 UTC [channelCmd] executeJoin -> INFO 002 Successfully s
===== peer1.users.registration-network.com joined channel 'reg

+ peer channel join -b registrationchannel.block
+ res=0
+ set +x
2021-07-29 11:36:22.408 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:22.457 UTC [channelCmd] executeJoin -> INFO 002 Successfully s
Updating anchor peers for REGISTRAR...
+ peer channel update -o orderer.property-registration-network.com:7050 -c reg
+ res=0
+ set +x
2021-07-29 11:36:22.601 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:22.618 UTC [channelCmd] update -> INFO 002 Successfully submit
===== Anchor peers updated for org 'registrarMSP' on channel 'reg

Updating anchor peers for USERS...
+ peer channel update -o orderer.property-registration-network.com:7050 -c reg
+ res=0
+ set +x
2021-07-29 11:36:27.796 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser an
2021-07-29 11:36:27.811 UTC [channelCmd] update -> INFO 002 Successfully submit
===== Anchor peers updated for org 'usersMSP' on channel 'reg
```

The command to install and instantiate the chaincode,

Command: sh fabricNetwork.sh install

Screenshot:



```
[m0k01h7@m-c02w719xhtd5 network % sh fabricNetwork.sh install
Installing chaincode for channel 'registrationchannel' with CLI timeout of '15
Continue? [Y/n]
proceeding ...
Unable to find image 'hyperledger/fabric-tools:latest' locally
docker: Error response from daemon: manifest for hyperledger/fabric-tools:lates
See 'docker run --help'.
LOCAL_VERSION=1.4.3
DOCKER_IMAGE_VERSION=
===== WARNING =====
Local fabric binaries and docker images are
out of sync. This may cause problems.
=====
```



Deploying Chaincode REGNET On Certification Network

```
Channel name : registrationchannel
Installing chaincode on peer0.registrar.property-registration-network.com.com ...
+ peer chaincode install -n regnet -v 0.0.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/chaincode/shim
+ res=0
+ set +x
2021-07-29 11:40:04.157 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001
2021-07-29 11:40:04.157 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002
2021-07-29 11:40:04.210 UTC [chaincodeCmd] install -> INFO 003 Installed remote chaincode regnet on peer0.registrar
===== Chaincode is installed on peer0.registrar =====

Installing chaincode on peer1.registrar.property-registration-network.com.com ...
+ peer chaincode install -n regnet -v 0.0.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/chaincode/shim
+ res=0
+ set +x
2021-07-29 11:40:04.328 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001
2021-07-29 11:40:04.328 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002
2021-07-29 11:40:04.343 UTC [chaincodeCmd] install -> INFO 003 Installed remote chaincode regnet on peer1.registrar
===== Chaincode is installed on peer1.registrar =====

Installing chaincode on peer0.users.property-registration-network.com.com ...
+ peer chaincode install -n regnet -v 0.0.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/chaincode/shim
+ res=0
+ set +x
2021-07-29 11:40:04.481 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001
2021-07-29 11:40:04.481 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002
2021-07-29 11:40:04.498 UTC [chaincodeCmd] install -> INFO 003 Installed remote chaincode regnet on peer0.users
===== Chaincode is installed on peer0.users =====
```

```
Instantiating chaincode on channel using peer0.registrar.property-registration...
+ peer chaincode instantiate -o orderer.property-registration-network.com:7050
usersMSP.member'\\''')
+ res=0
+ set +x
2021-07-29 11:40:04.623 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001
2021-07-29 11:40:04.623 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002
```

Following is the workflow + screenshot that I ran to test chaincode sequentially. Users being created are “Buyer” and “Seller”,

Method: requestNewUser

Test Case 1: To successfully create User “Buyer” request

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args": ["org.property-registration-network.user:request-NewUser", "Buyer", "abc@email.com", "9898989898", "aadhar-Number1"]}'

Result: 2021-07-29 11:59:29.372 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay-

load: "{\"name\":\"Buyer\", \"email\":\"abc@email.com\", \"phoneNumber\":\"9898989898\", \"aadharNumber\":\"aadhar-Number1\", \"createdAt\":\"2021-07-29T11:59:29.366Z\", \"updatedAt\":\"2021-07-29T11:59:29.366Z\"}"

Screenshot:

```
[root@8a9b9ff5c137:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args": ["org.property-registration-network.user:request-NewUser", "Buyer", "abc@email.com", "9898989898", "aadharNumber1"]}'  
2021-07-29 11:59:29.372 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload: {"name": "Buyer", "email": "abc@email.com", "phoneNumber": "9898989898", "aadharNumber": "aadhar-Number1", "createdAt": "2021-07-29T11:59:29.366Z", "updatedAt": "2021-07-29T11:59:29.366Z"}  
[root@8a9b9ff5c137:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Test Case 2: To Successfully create user “Seller” request

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args": ["org.property-registration-

network.user:request-

```
NewUser","Seller","xyz@email.com","0000000000","aadhar-  
Number2"]}'
```

Result: 2021-07-29 12:42:59.486 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay-

```
load:"{\"name\":\"Seller\",\"email\":\"xyz@email.com\",\"pho-  
neNumber\":\"0000000000\",\"aadharNumber\":\"aadhar-  
Number2\",\"createdAt\":\"2021-07-29T12:42:59.481Z\",\"up-  
datedAt\":\"2021-07-29T12:42:59.481Z\"}"
```

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincodeInvokeOrQuery -n regnet -C registrationchannel -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c  
'{"Args":["org.property-registration-network.user:request-  
NewUser","Seller","xyz@email.com","0000000000","aadharNumber2"]}'  
2021-07-29 12:42:59.486 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 0  
"aadharNumber2\",\"createdAt\":\"2021-07-29T12:42:59.481Z\",\"updatedAt\":\"2021-07-29T12:42:59.481Z\"}"
```

Test Case 3: Try requesting to create same “Buyer” user again

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:request-
NewUser","Buyer","abc@email.com","9898989898","aadhar-
Number1"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User with name : Buyer and with aadhar : aadharNumber1 is already present"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincodeInvokeOrQuery -n regnet -C registrationchannel -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c  
'{"Args":["org.property-registration-network.user:request-  
NewUser","Buyer","abc@email.com","9898989898","aadharNumber1"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transac
```

Method: approveNewUser

Test Case 1: Since Buyer is not yet approved by registrar, viewUser function for “Buyer” should return “Not Found”

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewUser","Buyer","aadharNumber1"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User : Buyer with aadhar number : aadharNumber1 not found"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewUser","Buyer","aadharNumber1"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User : Buyer with aadhar number : aadharNumber1 not found"
```

Test Case 2: Check if user request is present before approving. For this negative testing, I will test with username: Martand (for which I haven't raised request)

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:approveNewUser","Martand","aadharNumber1"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User request with name : Martand and aadhar number : aadharNumber1 for approval is not found as in network"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:approveNewUser","Martand","aadharNumber1"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User request with name : Martand and aadhar number : aadharNumber1 for approval is not found as in network"
```

Test Case 3: Registrar to approve “Buyer” user and add new field to user object upgradCoins = 0

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:approveNewUser","Buyer", "aadharNumber1"]}'

Result: 2021-07-29 12:56:48.340 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay-load:"{\"name\":\"Buyer\",\"email\":\"abc@email.com\",\"pho-neNumber\":\"9898989898\",\"aadharNumber\":\"aadhar-Number1\",\"createdAt\":\"2021-07-29T12:42:20.016Z\",\"updatedAt\":\"2021-07-29T12:56:48.336Z\",\"upgradCoins\":0}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincodeInvokeNewUser","Buyer", "aadharNumber1"]'  
2021-07-29 12:56:48.340 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 (
```

Test Case 4: Registrar to approve “Seller” user and add new field to user object upgradCoins = 0

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:approveNewUser","Seller", "aadharNumber2"]}'

Result: 2021-07-29 12:59:39.689 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay-

load:"{\"name\":\"Seller\",\"email\":\"xyz@email.com\",\"pho-neNumber\":\"0000000000\",\"aadharNumber\":\"aadhar-Number2\",\"createdAt\":\"2021-07-29T12:42:59.481Z\",\"updatedAt\":\"2021-07-29T12:59:39.684Z\",\"upgradCoins\":0}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -n mycc -c '{"function": "updateUser", "args": ["Seller", "aadharNumber2"]}'  
2021-07-29 12:59:39.689 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke on Seller:  
{"id": "Seller", "aadharNumber": "aadharNumber2", "name": "Seller", "aadharNumber2": "aadharNumber2", "createdAt": "2021-07-29T12:42:59.481Z", "updatedAt": "2021-07-29T12:42:59.481Z"}
```

Method: viewUser (from both user and registrar SC)

Test Case 1: view buyer

```
Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-net-work.user:viewUser","Buyer","aadharNumber1"]}'
```

Result: 2021-07-29 13:03:57.426 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay-

```
load:"{\"name\":\"Buyer\",\"email\":\"abc@email.com\",\"pho-  
neNumber\":\"9898989898\",\"aadharNumber\":\"aadhar-  
Number1\",\"createdAt\":\"2021-07-29T12:42:20.016Z\",\"up-  
datedAt\":\"2021-07-29T12:56:48.336Z\",\"upgradCoins\":0}"
```

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -n Aadhar -c '{"function": "create", "args": ["Buyer", "aadharNumber1"]}'  
2021-07-29 13:03:57.426 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke on peer0 on channel mychannel with args: [{"function": "create", "args": ["Buyer", "aadharNumber1"]}]  
{"id": "1", "status": "Success", "result": "AadharNumber1\\", "createdAt": "\\\"2021-07-29T12:42:20.016Z\\", "updatedAt": "\\\"2021-07-29T12:42:20.016Z\\", "version": "1"}
```

Test Case 2: view seller

```
Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewUser","Seller","aadharNumber2"]}'
```

Result: 2021-07-29 13:04:54.112 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result:

status:200 pay-
load:"{\"name\":\"Seller\",\"email\":\"xyz@email.com\",\"pho-
neNumber\":\"0000000000\",\"aadharNumber\":\"aadhar-
Number2\",\"createdAt\":\"2021-07-29T12:42:59.481Z\",\"up-
datedAt\":\"2021-07-29T12:59:39.684Z\",\"upgradCoins\":0}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args": ["org.property-registration-network.user:viewUser", "Seller", "aadharNumber2"]}'  
2021-07-29 13:04:54.112 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 pay-  
load:"{\"name\":\"Seller\",\"email\":\"xyz@email.com\",\"pho-  
neNumber\":\"0000000000\",\"aadharNumber\":\"aadhar-  
Number2\",\"createdAt\":\"2021-07-29T12:42:59.481Z\",\"updatedAt\":\"2021-07-29T12:59:39.684Z\",\"upgradCoins\":0}"
```

Test Case 3: view seller with wrong aadhar number (basically suggesting invalid user scenario)

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args": ["org.property-registration-network.user:viewUser", "Seller", "aadharNumber3"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User : Seller with aadhar number : aadharNumber3 not found"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args": ["org.property-registration-network.user:viewUser", "Seller", "aadharNumber3"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transac
```

Test Case 4: view Buyer from registrar SC

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args": ["org.property-registration-network.registrar:viewUser", "Buyer", "aadharNumber1"]}'

Result: 2021-07-29 13:10:05.648 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 pay-
load:"{\"name\":\"Buyer\",\"email\":\"abc@email.com\",\"pho-
neNumber\":\"9898989898\",\"aadharNumber\":\"aadharNumber1\",\"cre-
atedAt\":\"2021-07-29T12:42:20.016Z\",\"updatedAt\":\"2021-07-
29T12:56:48.336Z\",\"upgradCoins\":0}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:rechargeAccount","Buyer","aadharNumber1","upg100"]}'  
2021-07-29 13:10:05.648 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke or query completed
```

Method: rechargeAccount

Test Case 1: Invalid bank transaction ID sent for Buyer account. Only upg100, upg500, upg1000 are accepted

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:rechargeAccount","Buyer","aadharNumber1","upg200"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Bank Transaction ID : upg200"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:rechargeAccount","Buyer","aadharNumber1","upg200"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Bank Transaction ID : upg200"
```

Test Case 2: User not in network

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:rechargeAccount","Martand","aadharNumber1","upg100"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: User : Martand with aadhar number : aadharNumber1 not found"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:rechargeAccount","Buyer","aadharNumber1","upg100"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Owner : Martand with aadhar number : abcd not found in network"
```

Test Case 3: Recharge Buyer's account with 100 upgradCoins

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:rechargeAccount","Buyer","aadharNumber1","upg100"]}'

Result: 2021-07-29 13:18:05.151 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay-

load:"{\"name\":\"Buyer\",\"email\":\"abc@email.com\",\"phoneNumber\":\"9898989898\",\"aadharNumber\":\"aadharNumber1\",\"createdAt\":\"2021-07-29T12:42:20.016Z\",\"updatedAt\":\"2021-07-29T13:18:05.148Z\",\"upgradCoins\":100}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:rechargeAccount","Buyer","aadharNumber1","upg100"]}'  
2021-07-29 13:18:05.151 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 pay:  
load:"{\"name\":\"Buyer\",\"email\":\"abc@email.com\",\"phoneNumber\":\"9898989898\",\"aadharNumber\":\"aadharNumber1\",\"createdAt\":\"2021-07-29T12:42:20.016Z\",\"updatedAt\":\"2021-07-29T13:18:05.148Z\",\"upgradCoins\":100}"
```

Method: propertyRegistrationRequest

Test Case 1: Check if owner is in network. To carry out this negative test case, I will check if user "Martand" who is not in network is unable to register his property

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args": ["org.property-registration-network.user:propertyRegistrationRequest","Martand","abcd","1234","100"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Owner : Martand with aadhar number : abcd not found in network"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:propertyRegistrationRequest","Martand","abcd","1234","100"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property with ID Martand is not found for provided propertyID"
```

Test Case 2: Successfully Register property with propertyID : 1234 by Seller and price :100 upgradCoins, status : “registered” and owner : seller + aadharNumber (composite key)

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:propertyRegistrationRequest","Seller","aadharNumber2","1234","100"]}'

Result: 2021-07-29 13:41:44.872 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"name\\":\\"Seller\\",\\"aadharNumber\\":\\"aadharNumber2\\",\\"propertyID\\":\\"1234\\",\\"price\\":\\"100\\",\\"owner\\":\\"\\u0000org.property-registration-network.user\\u0000Seller-aadharNumber2\\u0000\\",\\"status\\":\\"registered\\"}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewProperty","1234"]}'  
2021-07-29 13:41:44.872 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"name\\":\\"Seller\\",\\"aadharNumber\\":\\"aadharNumber2\\",\\"propertyID\\":\\"1234\\",\\"price\\":\\"100\\",\\"owner\\":\\"\\u0000org.property-registration-network.user\\u0000Seller-aadharNumber2\\u0000\\",\\"status\\":\\"registered\\"}"
```

Test Case 3: viewProperty for propertyID: 1234. Since property is not yet approved, this method should “Not Found”

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewProperty","1234"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property with ID 1234 is not found for provided propertyID"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewProperty","1234"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property with ID 1234 is not found for provided propertyID"
```

Method: approvePropertyRegistration by registrar

Test Case 1: Check if property is requested for registration by wrong ID: 12345

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.registrar:approvePropertyRegistration","1234"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Request for Property with ID : 12345 is not found in network"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:approvePropertyRegistration","12345"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Request for Property with ID : 12345 is not found in network"
```

Test Case 2: Approve property: 1234 which was requested previously

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.registrar:approvePropertyRegistration","1234"]}'

Result: 2021-07-29 13:49:50.102 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\"name\":\"Seller\",\"aadharNumber\":\"aadharNumber2\",\"proper-tyID\":\"1234\",\"price\":\"100\",\"owner\":\"\\u0000org.property-registration-network.user\\u0000Seller-aadhar-Number2\\u0000\",\"status\":\"registered\"}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:viewProperty","1234"]}'  
2021-07-29 13:49:50.102 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{"name":"Seller","aadharNumber":"aadharNumber2","proper-tyID":"1234","price":"100","owner":"\u0000org.property-registra-tion-network.user\u0000Seller-aadhar-Number2\u0000","status":"registered"}"
```

Test Case 3: view approved property: 1234. Now we will be able to view this property

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.registrar:viewProp-erty","1234"]}'

Result: 2021-07-29 13:53:27.988 UTC [chaincodeCmd] chaincodeIn-vokeOrQuery -> INFO 001 Chaincode invoke successful. result: sta-tus:200 payload:"{"name":"Seller","aadharNumber":"aadhar-Number2","proper-tyID":"1234","price":"100","owner":"\u0000org.property-registra-tion-network.user\u0000Seller-aadhar-Number2\u0000","status":"registered"}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.registrar:viewProperty","1234"]}'  
2021-07-29 13:53:27.988 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{"name":"Seller","aadharNumber":"aadharNumber2","proper-tyID":"1234","price":"100","owner":"\u0000org.property-registra-tion-network.user\u0000Seller-aadharNumber2\u0000","status":"registered"}"
```

Test Case 4: To prevent re-registration of property already available in network

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:propertyRegistra-tionRequest","Seller","aadharNumber2","1234","100"]}'

Result: Error: endorsement failure during invoke. response: sta-tus:500 message:"transaction returned with failure: Error: Property : 1234 about to be registered is already in network"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:viewProperty","1234"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Improper
```

Test Case 5: viewProperty is also available in User SC

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args": ["org.property-registration-network.user:viewProperty", "1234"]}'

Result: 2021-07-29 13:56:01.657 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\"name\":\"Seller\",\"aadharNumber\":\"aadharNumber2\",\"propertyID\":\"1234\",\"price\":\"100\",\"owner\":\"\\u0000org.property-registration-network.user\\u0000Seller-aadharNumber2\\u0000\",\"status\":\"registered\"}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args": ["org.property-registration-network.user:viewProperty","1234"]}'  
2021-07-29 13:56:01.657 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\"name\":\"Seller\",\"aadharNumber\":\"aadharNumber2\\u0000Seller-aadharNumber2\\u0000\",\"status\":\"registered\"}"
```

Method: updateProperty by Seller as onSale

Test Case 1: Check if provided status to update property is either registered or onSale, throw error if its not

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args": ["org.property-registration-network.user:updateProperty", "1234", "Seller", "aadharNumber2", "onSale1"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Improper

status value provided, accepted values are only registered or onSale : onSale1"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:updateProperty","1234","Seller", "aadharNumber2", "onSale1"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property is not found for provided propertyID : 1234"  
root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Test Case 2: To check if property exist in network before updating. To test this negative test case, using propertyID : 12345

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:updateProperty","12345","Seller", "aadharNumber2", "onSale"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property is not found for provided propertyID : 12345"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:updateProperty","12345","Seller", "aadharNumber2", "onSale"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property is not found for provided propertyID : 12345"  
root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Test Case 3: Wrong Owner trying to update property status instead of Seller, Martand tries to update status

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:updateProperty","1234","Martand", "aadharNumber2", "onSale"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: UnAuthorized user Martand with aadhar number aadharNumber2 is trying to update status of property"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:updateProperty","1234","Seller", "aadharNumber2", "onSale"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property 1234 is not found for provided propertyID"
```

Test Case 4: Successfully update property: 1234 by Seller (Owner)

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:updateProperty","1234","Seller", "aadharNumber2", "onSale"]}'

Result: 2021-07-29 14:14:14.306 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"name\\":\\"Seller\\",\\"aadharNumber\\":\\"aadharNumber2\\",\\"propertyID\\":\\"1234\\",\\"price\\":\\"100\\",\\"owner\\":\\"\\u0000org.property-registration-network.user\\u0000Seller-aadharNumber2\\u0000\\",\\"status\\":\\"onSale\\"}"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:updateProperty","1234","Seller", "aadharNumber2", "onSale"]}'  
2021-07-29 14:14:14.306 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"name\\":\\"Seller\\",\\"aadharNumber\\":\\"aadharNumber2\\",\\"propertyID\\":\\"1234\\",\\"price\\":\\"100\\",\\"owner\\":\\"\\u0000org.property-registration-network.user\\u0000Seller-aadharNumber2\\u0000\\",\\"status\\":\\"onSale\\"}"
```

Method: purchaseProperty

Test Case 1: Check if property to be purchased is in network, testing with wrong propertyID 12345

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:purchaseProperty","12345","Seller", "aadharNumber2"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property 12345 is not found for provided propertyID"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:updateProperty","1234","Seller", "aadharNumber2", "registered"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property 1234 is not for sale"
```

Test Case 2: Check if Property is up for sale. For this test case, will update property 1234 back to “registered” and trigger purchaseProperty method

Command:

```
peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c  
'{"Args":["org.property-registration-network.user:updateProperty","1234","Seller", "aadharNumber2", "registered"]}'  
peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c  
'{"Args":["org.property-registration-network.user:purchaseProperty","1234","Seller", "aadharNumber2"]}'
```

Result:

```
2021-07-29 14:17:11.960 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\"name\":\"Seller\",\"aadharNumber\":\"aadharNumber2\",\"proper-  
tyID\":\"1234\",\"price\":\"100\",\"owner\":\"\\u0000org.property-  
registration-network.user\\u0000Seller-aadhar-  
Number2\\u0000\",\"status\":\"registered\"}"
```

Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Property 1234 is not for sale"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -n property -c '{"Args":["Seller","aadharNumber2"]}' -C mychannel -P "OR ('Org1MSP.member','Org2MSP.member')"
2021-07-29 14:17:11.960 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 OR ('Org1MSP.member','Org2MSP.member')
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode query -n property -c '{"Args":["Seller","aadharNumber2"]}' -C mychannel
Error: endorsement failure during invoke. response: status:500 message:"transaction failed
```

Updated property status 1234 back to “onSale”

Test Case 3: Check if Buyer is in network, to test this negative test case, I have passed “Martand” as buyer

```
Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","1234","Martand", "aadharNumber2"]}'
```

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Buyer Martand with aadhar: aadharNumber2 is not registered in network"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -C mychannel -n mycc -v 1.0 -c '{"function": "add", "args": ["property", "1234", "Martand", "aadharNumber2"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction failed, errors at application layer:  
[{"code": 123, "msg": "The transaction failed because it violated the business logic of the application."}]
```

Test Case 4: To successfully buy property 1234, from seller to buyer

Buyer world state: Notice buyer has 100 upgradCoins

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -n Aadhar -c '{"function": "create", "args": ["Buyer", "aadharNumber1"]}'  
2021-07-29 14:33:20.034 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke on peer0 on channel mychannel with args: [{"function": "create", "args": ["Buyer", "aadharNumber1"]}]  
{"id": "1", "buyer": "Buyer", "aadharNumber": "aadharNumber1", "createdAt": "2021-07-29T12:42:20.016Z", "updatedAt": "2021-07-29T12:42:20.016Z"}
```

Seller world state: upgradCoins held by Seller is 0

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -n Seller -v 1 -c '{"function": "create", "args": ["Seller", "aadharNumber2"]}'  
2021-07-29 14:34:09.493 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke on chain main with args: [{"function": "create", "args": ["Seller", "aadharNumber2"]}]  
2021-07-29 14:34:09.493 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke on chain main with args: [{"function": "create", "args": ["Seller", "aadharNumber2"]}]
```

Property world state: Notice, owner of the property is seller and this property is onSale and price of property is 100 upgradCoins

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","1234","Buyer", "aadharNumber1"]}'  
2021-07-29 14:35:02.314 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"\000org.property-registration-network.property\0001234\000"
```

Now, Buyer performs successful purchase of property 1234 from seller

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c
'{"Args":["org.property-registration-network.user:purchaseProperty","1234","Buyer", "aadharNumber1"]}'

Result: 2021-07-29 14:38:18.866 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"\000org.property-registration-network.property\0001234\000"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","1234","Buyer", "aadharNumber1"]}'  
2021-07-29 14:38:18.866 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"\000org.property-registration-network.property\0001234\000"  
root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Update state of Buyer: Notice, Buyer's upgradCoins is reduced to 0 (as price of property was 100)

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:updateProperty","1234","Buyer", "aadharNumber1"]}'  
2021-07-29 14:40:25.608 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"\000org.property-registration-network.property\0001234\000"
```

Updated state of Seller: Notice, upgradCoins now held by Seller has increased to 100 as he has sold his property of worth 100

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","1234","Buyer", "aadharNumber1"]}'  
2021-07-29 14:41:39.994 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke or query completed
```

Updated state of property: Notice, owner of property is changed to Buyer and status of property is updated back to registered

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","1234","Buyer", "aadharNumber1"]}'  
2021-07-29 14:43:08.340 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke or query completed
```

Test Case 4: Now Buyer with 0 upgradCoins trying to buy another registered property with ID: 9999

Command: peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","1234","Buyer", "aadharNumber1"]}'

Result: Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Buyer Buyer doesn't have sufficient balance to buy this property"

Screenshot:

```
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.user:purchaseProperty","9999","Buyer", "aadharNumber1"]}'  
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Buyer Buyer doesn't have sufficient balance to buy this property"  
[root@4f94c1f5fe1a:/opt/gopath/src/github.com/hyperledger/fabric/peer# ]
```