

READ ME FOR PROGRAMMING ASSIGNMENT 2 - BITS F452 BLOCKCHAIN TECHNOLOGY

DETAILS

Dexter's Consensus Algorithm

Improving the security of his Dexter's blockchain by incorporating a consensus algorithm in it.

Delegated Proof-of-Stake (DPoS) has been applied to Dexter's Blockchain.

GROUP Number - 51

GROUP MEMBERS

MANAN AGRAWAL – 2019A3PS0400H

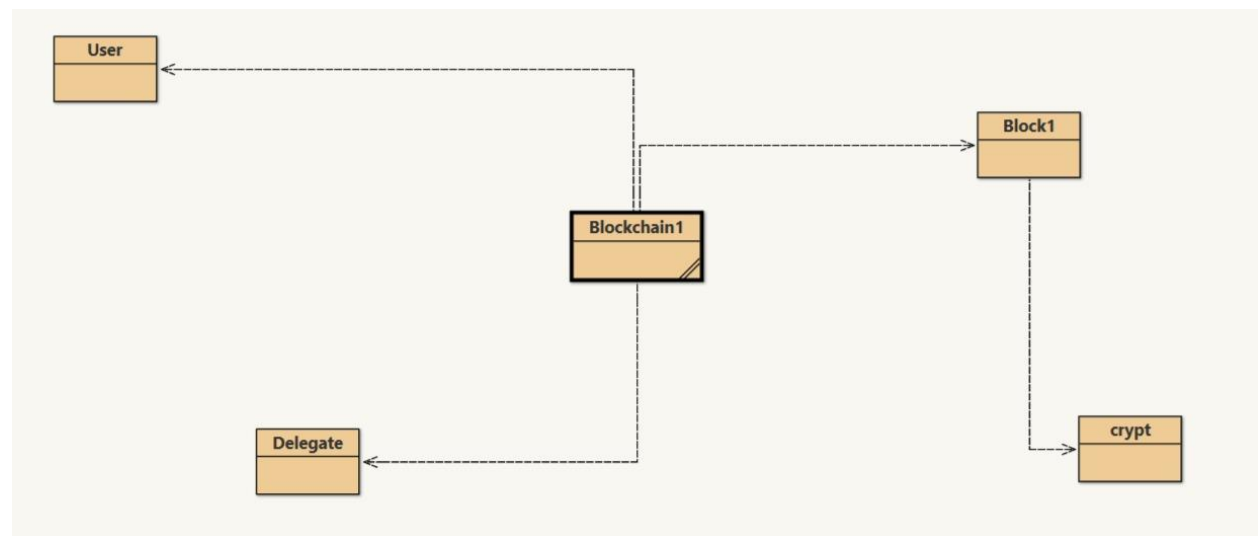
JUHIL DESAI - 2019A7PS0153H

TOSHIT CHEELI - 2019A3PS0462H

DELEGATED PROOF-OF-STAKE (DPoS)

Delegated Proof of Stake is robust under every conceivable natural network disruption and even secure in the face of corruption of a large minority of producers.

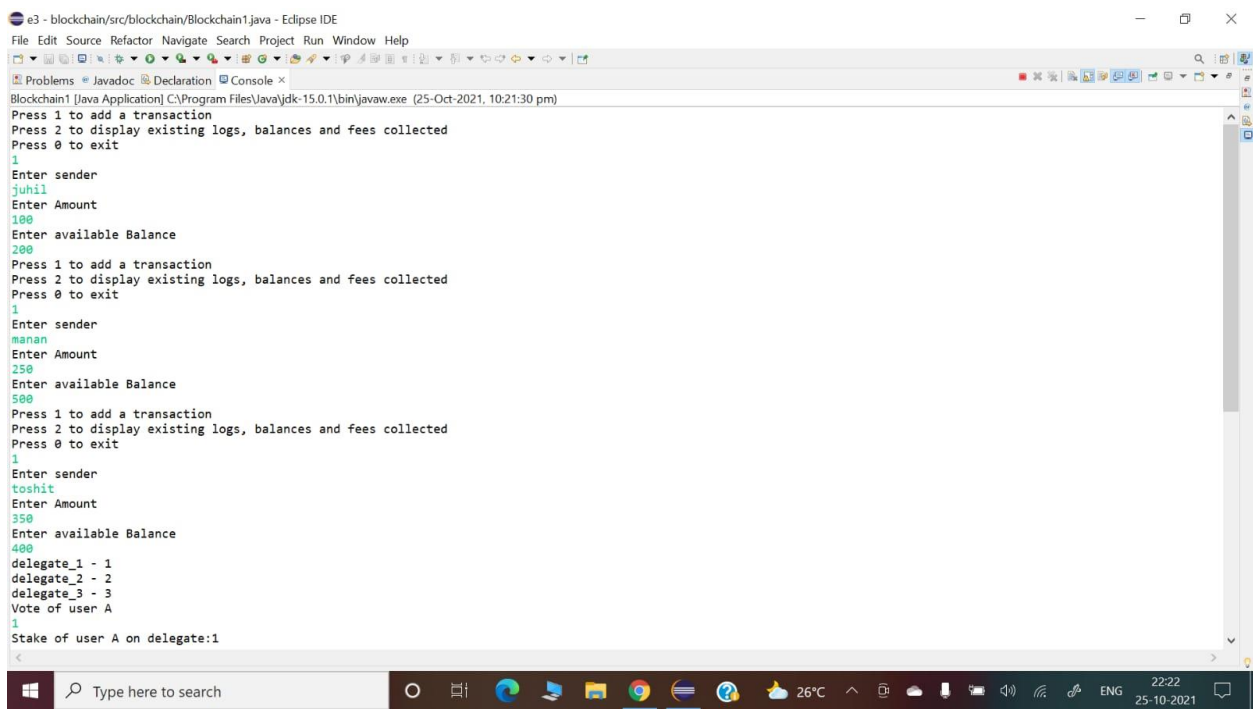
The DPoS algorithm is electing a group of block producers and scheduling production. The election process makes sure that stakeholders are ultimately in control because stakeholders lose the most when the network does not operate smoothly.



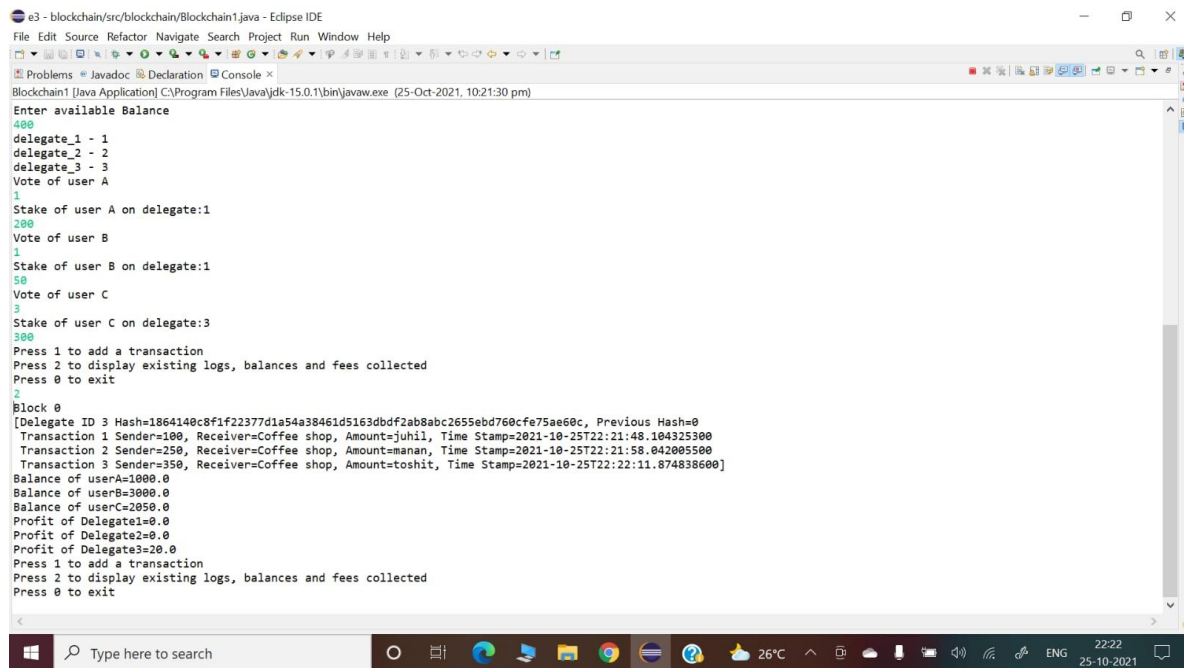
EXECUTING PROGRAM

- 1) Feed in sender's name and amount to transaction amount.
- 2) Users' needs to vote for the delegates.
- 3) Voted delegate creates a block for the 3 three transactions .
- 4) Verification is done by the voted delegate and other delegates validates.

(Screenshots of a block creation is attached below)



```
e3 - blockchain/src/blockchain/Blockchain1.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Blockchain1 [Java Application] C:\Program Files\Java\jdk-15.0.1\bin\javaw.exe (25-Oct-2021, 10:21:30 pm)
Press 1 to add a transaction
Press 2 to display existing logs, balances and fees collected
Press 0 to exit
1
Enter sender
juhil
Enter Amount
100
Enter available Balance
200
Press 1 to add a transaction
Press 2 to display existing logs, balances and fees collected
Press 0 to exit
1
Enter sender
manan
Enter Amount
250
Enter available Balance
500
Press 1 to add a transaction
Press 2 to display existing logs, balances and fees collected
Press 0 to exit
1
Enter sender
toshit
Enter Amount
350
Enter available Balance
400
delegate_1 - 1
delegate_2 - 2
delegate_3 - 3
Vote of user A
1
Stake of user A on delegate:1
```



```
e3 - blockchain/src/blockchain/Blockchain1.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Blockchain1 [Java Application] C:\Program Files\Java\jdk-15.0.1\bin\javaw.exe (25-Oct-2021, 10:21:30 pm)
Enter available Balance
400
delegate_1 - 1
delegate_2 - 2
delegate_3 - 3
Vote of user A
1
Stake of user A on delegate:1
200
Vote of user B
1
Stake of user B on delegate:1
50
Vote of user C
3
Stake of user C on delegate:3
300
Press 1 to add a transaction
Press 2 to display existing logs, balances and fees collected
Press 0 to exit
2
Block 0
[Delegate ID 3 Hash=1864140c8f1f22377d1a54a38461d5163dbdf2ab8abc2655ebd760cfe75ae60c, Previous Hash=0
Transaction 1 Sender=100, Receiver=Coffee shop, Amount=juhil, Time Stamp=2021-10-25T22:21:48.104325300
Transaction 2 Sender=250, Receiver=Coffee shop, Amount=manan, Time Stamp=2021-10-25T22:21:58.042005500
Transaction 3 Sender=350, Receiver=Coffee shop, Amount=toshit, Time Stamp=2021-10-25T22:22:11.874838600]
Balance of userA=1000.0
Balance of userB=3000.0
Balance of userC=2050.0
Profit of Delegate1=0.0
Profit of Delegate2=0.0
Profit of Delegate3=20.0
Press 1 to add a transaction
Press 2 to display existing logs, balances and fees collected
Press 0 to exit
```

IMPORTANT NOTES

- 1) 3 users and 3 delegates are considered in this program.
- 2) Reward after every successful block production is fixed (for now) 50 units for users and 20 units for the delegate.
- 3) Voted delegate takes the incentive and remaining delegates validate.
- 4) After block has been created by delegate, it is synced to the block chain.

FUNCTIONALITIES

1) Voting –

Users get to vote for their delegate and add stake for their vote, the major voted delegate creates the block and adds to the block chain.

2) Verification-

Verification is done by checking the amount in the balance of the sender with the amount he is sending.

If the sending amount is more than the senders balance then the transaction is not successful and the transition is invalid, in alter case the transition is successful and validated.

3) Synchronization –

Each node has its own blockchain, when the voted delegate creates a block it is added in his blockchain and after validation it is synchronized with all the blockchains.

4) Profit Splitting –

The voted delegate gets a fixed amount of 50 units and the stake holders get the portion of 20 units depending on the stake.