K. J. Somaiya College of Engineering, Mumbai-77

Department of Computer Engineering

Batch: A2 Roll No.: 16010121045
Experiment No. 1

Title: Implementation of PoS and POW in Blockchain

Objective: Implementation of PoS and POW in Blockchain

Expected Outcome of Experiment:

CO	Outcome

Books/ Journals/ Websites referred:

Implementation Details:

```
import hashlib

# initializing string
string = "pargat"

nonce = 10000

while(True):
    new_string = string + str(nonce)
    result = hashlib.sha256(new_string.encode("utf-8"))
    print(result.hexdigest())
    nonce += 1
    if(result.hexdigest()[0:3] == "0000"):
        break

print(result.hexdigest())
print(nonce)
```

PoW:

```
c3fe82a121ce0692878ed38704d78af75281af1f0b758144c63f7d311afd00d3
097f00aa3cceb2f9a5553ac5f12a883a54bc00acb30da64f9f81798ce8ef4045
c084fc371da6e1ac135205e9bb034ea3e0bed5fcd20fc0d06c7ab36f8600e2db
971e7486da23ace0f95f345c1c4701765e4606606b49c83676f54fb1d9e5f45f
48ed608ee932b4aa81de3543864732a830e6ccf95463d37ac5131e82ff748f6e
a0011997aa68deb1180d798d576e7f1424a44481a844f878e7c1004a7071fcc5
9fc8c50bb0bc3a46f3df521d5226f939e011a57fb3162ebdf3bb08b3fda3ede1
cd5a55fc19331934d537948778aefc90394d815c893dac4c2d3ef5bfde808595
d378ffecfa6476381af5a3822122ce335f6f7784dea9bb2fb0caa220662c80bb
776f6da5e566ff71910e1780f6ff96ca36b158d3b9ce86730c280cf8562e2d05
1a4565a332e8d7144667086eea4b98c87d94e9a14160750945420660da23defa6
653302b07836ea00c0c2e325789fc94c3bbc7b4e6a4cdb1ef4e04b3217016943
a205a6e79153963b194ad9c0f2f6b5e4f19e8314d71d4e53c90c5d930156feeb
33ce164aa4f1c1b40d3da815d6799ec2f0523c59175a8a8f1282b8e910ef970b
64fd20b6ea943290d4348911db0a6999c50cbdf1823bc416c69b0c7cc3d8eb06
caa0c7813d57989a20e6406c08e3b9771fefc9291049e860db1fae16b791ede1
ccd72a3dbf434ed3c3e65c0d65a2b5ee4061844ed2209ff11e04aa5c5c814f44
5779d3f7eb126f49155b5ba1864a09a86bcfbacd18bd2e6ffe0763b3bcee2d9d
196ab4bb1c98733ae242408b8f0604b866951d516239196dec410d6e4ce49f22
9019c29799ce92ea6c860d0802d41db93b70411712229a08ac7082c873574904
1e45e3f78e198ea5e256d066ff8b4d5ba2e125b7bb3ce367dc30735175b6435c
ff1ecb729a97712dfc3098905fc0be30b77e50e17353292073d4330701da843b
9118a3c984a310052f89f33b800e43193de10edb7740581748ff2c3f73485603
f5672f87a446c94812f9a6ecef27f87677c144a2bda22515265ac3eab8691506
c4aa3da1d2a69e00b8805c8418ca541b21f96216c45f5a475b363d88d9f9d20b
2efc972fefa96a5ecdb9be77167c6db6b8f64af1f1451fb4e0fae1ab55cc709a
08696440ac8f22b5248ff25e9ad8b90625f77c972850ac7242ba83689ea8485c
0588071296f057dcdca6dd86ecfd56ca4bdc185779b40aaf8f6049756d8f6f28
576eb814be50b3d762a28ec5615f801b477c91b6363890ba5a446e6f8a22b4d0
08f83f800e9c45711437d22481b3407d3350dcafab629d94f4c7e95a8f0fa560
d636fe18a60b07a6f96ade9764ac0eb64eb3532565cd133aa8dc15ca37504825
9581063291a97810143d5ced772e0760292f07037fc5b08ab7b9565ccf24cc94
c11a66a9e4f996e23e6f19daa78fdeba9d41161e087fb2d2ddfe206499cafe69
e4225b0673cf01b7fc1c363a4ab6655c9131f7492d205f8ca95d4fe824dffe8f
8d7105c8746db59ff225bdda8d8145cf35fc5192ec2d5bb2f5098e3090663114
463b0719579bfcfaf71007a8411cef9e91ddecdbd07fcf3e31b39a32058daf7a
93a61123e15d885e7358d6485e5a0b28c90d5611f40cb0f950fa50d54cf598f7
7091e2114b83b712c275849d9fb8178a9f1a9f5de1f17752d2bfa490024b871e
20550e0dd96767bc077c96843608385f0f7b9b4f80ca545a528921454e09fd93
c6fda78842c9630652ca1ad915fc745c928fc42cf4d1f534f40ebf3366a3b7ca
9e95b5e50019cab8e03a90a3a8e92097dae9674b14dbfffd63ca2a32a732af8c
126695f990b47affa1a5597f6868b2399b740df6e203584ebf60b4700193773
2f290a6af4336e76203719b8992c3339788318bc6e73d806d4fe7368d8421fea
2b718f0cfd66ad489710f4781a008b00122e881376057391e5a1269c5e165c15
3386a87d261f5635edc59255c897684e523c7a642cbe0cd189d8118d4f0ad020
588ed8d0cbc34246e4f58c65175a34179ce472bacc50855c2d2e7479699dfe0d
0002154a0460fb5224a19887b555434f7cf61b492123e1b626bd02366a1d87cc
23026
```

PoS:

```python
import random

arr = ['P0', 'P1', 'P2', 'P3', 'P4']

def randSelection(arr):
    print(arr[random.randint(0, 4)])

def voteSelection(arr):
    voteArr = [0, 0, 0, 0, 0]
    for i in range(len(arr)):
        while True:
            newVote = int(input("Who does " + arr[i] + " vote for (just enter their number): "))
            if 0 <= newVote <= 4:
                break
```

```
            print("Enter a valid input again!\n")
        voteArr[newVote] += 1
    print(arr[voteArr.index(max(voteArr))])

def coinAgeSelection(arr):
    ageArr = [0, 0, 0, 0, 0]
    for i in range(len(arr)):
        while True:
            newAge = int(input("What is the coin age of " + arr[i] + ": "))
            if newAge >= 0:
                break
            print("Enter a valid input again!\n")
        ageArr[i] = newAge

    for t in range(5):
        print(arr[ageArr.index(max(ageArr))])

    for j in range(len(ageArr)):
        print(ageArr[j], "\n")
        ageArr[j] = ageArr[j] + 1

    ageArr[ageArr.index(max(ageArr))] = 0

randSelection(arr)
voteSelection(arr)
coinAgeSelection(arr)
```

```
❯ python3 -u "/Users/pargatsinghdhanjal/Desktop/So
P4
Who does P0 vote for (just enter their number): 1
Who does P1 vote for (just enter their number): 2
Who does P2 vote for (just enter their number): 1
Who does P3 vote for (just enter their number): 1
Who does P4 vote for (just enter their number): 1
P1
What is the coin age of P0: 4
What is the coin age of P1: 5
What is the coin age of P2: 2
What is the coin age of P3: 1
What is the coin age of P4: 1
P1
P1
P1
P1
P1
4

5

2

1

1
```

Conclusion:-

In this experiment, we learnt about PoS (Proof of Stake) and PoW (Proof of Work) in respect to blockchain technology, and how each of them is useful in their own way.