# Question-1

```
# # Welcome to Jupyter!
get_ipython().system('pip install dict_hash')

from IPython.display import clear_output
from dict_hash import sha256
import time

def mineBlock(ditBlock):
    flag = True
    nonce = 0
    start = time.time()
    while flag:
        dit["nonce"] = nonce
        hsh = sha256(ditBlock)
        pos1 = hsh[0]
        pos2 = hsh[1]
        pos3 = hsh[2]
        pos4 = hsh[3]
        pos5 = hsh[4]
        pos6 = hsh[5]
        pos7 = hsh[6]
        pos8 = hsh[7]
        pos9 = hsh[8]
        pos10 = hsh[9]


        if pos1 == '0' and pos2 == "0" and pos3 == "0" and pos4 == "0"and pos5 == "0"and pos6 ==
"0"and pos7 == "0"and pos8 == "0"and pos9 == "0"and pos10 == "0":
            flag = False
            dit["hash"] = hsh
            print(ditBlock)
            end = time.time()
            print(f"Runtime of the program is {end - start}")
        else:
            print(nonce)
#             clear_output(wait=False)
            nonce = nonce + 1




dit = {}
dit["Block Number"] = 1
dit["Trxns"] = "Record1 Record2 Record3 Record4 Record5 Record6 Record7 Record8 Record9
Record10"
```

```
dit["nonce"] = 0
dit["previousHash"] = ""


dit["hash"] = sha256(dit)
dit
  mineBlock(dit)
```

***Code taking too much time for giving output so unable to find Nonce and time of execution***

# ***Question-2***

## *Difference between Proof of work (Pow) and Proof of stake (Pos)*

***1. Definitions -*** In a PoW system, transactions are verified by “miners”, who use their computer hardware to solve complex mathematical equations for the right to add new groups of transactions (blocks) to the blockchain (record of all blocks and the transactions in them).
But Proof of Stake works a bit differently. Instead of miners, there are “validators” (also called other names, such as “bakers” on Tezos). These validators don’t use hardware to solve complex mathematical puzzles. Instead, they lock up or “stake” their crypto as collateral for the right to verify transactions.

***2. Energy Consumption -*** When it comes to Proof of Stake vs Proof of Work, one of the main arguments for using PoS is its minimal *energy consumption*. The complex mathematical puzzles miners have to solve in PoW are very

computationally intensive. In other words, their hardware uses a lot of electricity to try and solve those problems.
PoS, on the other hand, requires very little energy to run. This could be better for the environment in the long term, as crypto mining will probably only grow bigger and bigger moving forward thanks to the bright future of cryptocurrency.

***3.Decentralization -*** When it comes to the decentralization of Proof of Stake vs. Proof of Work, which is more decentralized? Since mining requires the purchase of hardware, the technical know-how to set it up, and high energy consumption, not everyone is interested in becoming a miner. Meanwhile, becoming a validator is far easier by comparison, requiring just some cryptocurrency.

***4. Security -*** Proof of Work has shown its resilience, at least on Bitcoin, the first and oldest cryptocurrency. In Bitcoin's existence of more than a decade, Proof of Work has yet to fail. On the other hand, Proof of Stake might seem like a good idea in some respects, but it just isn't as proven or tested, which isn't good when peoples' money is on the line.