**What is mining? Why is it important in the field of blockchain?**

[- Mining in the case of blockchain is the process of validating transactions, creating a block by solving complex computational problems to find the correct Hash value to the Block and getting rewarded the transaction fees (plus newly mined cryptocurrencies in case of crypto mining)

- Mining aids security as all active miners work in unison to validate new blocks, ultimately validating the transaction recorded in that block. Mining also helps the miner economically sustain as they are rewarded with the transaction fee - this reward system attracts new miners and ultimately helps in growing the miner network and aiding in decentralization of the network]

In the realm of blockchain, mining is a pivotal process encompassing the validation of transactions and the creation of blocks through the resolution of intricate computational problems. Miners diligently work to identify the correct hash value for a block, which involves solving complex mathematical puzzles. As a reward for their computational efforts, miners receive transaction fees alongside newly minted cryptocurrencies in the case of crypto mining.

Beyond its economic incentives, mining plays a crucial role in enhancing the security of the blockchain. Active miners collaborate harmoniously to validate new blocks, thereby validating the transactions recorded within those blocks. This collaborative effort fortifies the integrity of the blockchain, making it resistant to fraudulent activities. Moreover, the reward system associated with mining serves as an economic sustenance mechanism for miners, attracting new participants to join the network. This, in turn, fosters network growth and contributes to the decentralization of the blockchain network, ensuring a distributed and resilient infrastructure.

**What is a Block? List out the elements inside the Block.**

A block is a fundamental unit of data containing information about transactions, along with a unique identifier called a hash linked together in a chain to form a blockchain.

1. Block Number

2. Timestamp

3. Nonce

4. Current and Previous Hash

5. Transaction Data

**What is Nonce and Target in Blockchain Mining?**

[- Nonce is a random number assigned to each Block. Maybe it is used to track a transaction in a chain of blocks

- Target is a character of the hash of a new Block that is preset by the system (which miners need to solve to get the reward)]

Nonce, short for "number only used once," is a cryptographic term that plays a crucial role in specific consensus mechanisms, particularly in proof-of-work (PoW) blockchain systems. The nonce is a random or semi-random number that miners modify in their attempts to find a hash value that meets certain criteria and satisfies the difficulty target set by the network.

In blockchain mining, the "target" refers to a specific numerical value set by the network as part of the proof-of-work (PoW) consensus mechanism. The target plays a crucial role in determining the difficulty level of mining and, consequently, in regulating the rate at which new blocks are added to the blockchain. The target is a part of the mining process used to find a valid hash for a new block.