Distributed systems:

* Distributed Database (collection of data)
  + Storage devices are not attached to a common processor
* Distributed database system consists of loosely coupled sites that share no physical components.
* Users should be able to interact with the system as if it was one logical unit
* Database integrity across multiple databases
* There are two principal approaches to store a relation r in a distributed database system:
  + A) [Replication](https://en.wikipedia.org/wiki/Database_replication)
  + B) Fragmentation/[Partitioning](https://en.wikipedia.org/wiki/Partition_(database))
* A distributed database can be run by independent or even competing parties as, for example, in [bitcoin](https://en.wikipedia.org/wiki/Bitcoin)

Blockchain:

* A blockchain is a [distributed database](https://en.wikipedia.org/wiki/Distributed_database) that is used to maintain a continuously growing list of [records](https://en.wikipedia.org/wiki/Record_(computer_science)), called blocks. Each block contains a [timestamp](https://en.wikipedia.org/wiki/Trusted_timestamping) and a link to a previous block.
* Block chain is a new database, right now we are all centralized, Blockchain is decentralized
* Blockchain, decentralized consensus, trusted computing, smart contracts, and proof of work/stake.
* Now have to learn how to write into the Blockchain instead of the database

Decentralized Consensus:

* A decentralized scheme, on which the bitcoin protocol is based, transfers authority and trust to a decentralized virtual network and enables its nodes to continuously and sequentially record transactions on a public “block,” creating a unique “chain”: the blockchain.
* Each successive block contains a “hash” (a unique fingerprint) of the previous code; therefore, cryptography (via hash codes) is used to secure the authentication of the transaction source and removes the need for a central intermediary.
* The combination of cryptography and blockchain technology together ensures there is never a duplicate recording of the same transaction.

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* As these are not backed by anything, they can be created by software, just as easily as you can write down on a sheet of paper “I hereby create 1 billion fun-coins”. In fact if you did that, and then kept a good record of which friends you gave these to, and if you could record onward transactions as your friends gave them to other friends, you would be doing pretty much the same as what these digital ledgers do