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General Studies
Bitcoins - Cryptocurrency

- Dr. Manishika Jain, NTSE Scholar, UGC NET JRF, CSIR NET JRF
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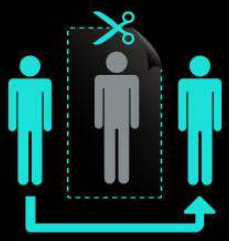

"If you can't explain it simply, you don't understand it well enough." - Albert Einstein

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Why Use Bitcoin?

- Peer to peer
- Account cant be closed
- On digital wallet
- Simple as email
- Secured by Miners (rewarded for maintaining ledger)
- Changing finance
- Minimize transaction fee
- Cannot be frozen & blocked

Cryptocurrency - Anonymous

- Crypto = Hidden
- Key
- Signature
- Bitcoin/Altcoins – 1st decentralized cryptocurrency in 2009

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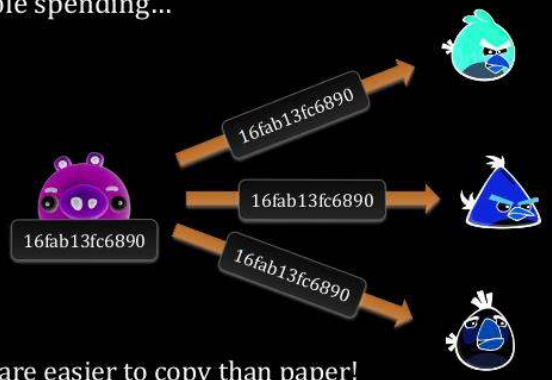
Double Spending Problem

Main problem with the digital money

Double spending...



Bits are easier to copy than paper!

Open Ledger

- Chain of transactions
- Open & public
- Decide valid/not valid
- Centralized place
- Who is doing is private

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Distributed Open Ledger

- Each can have copy of the ledger
- Many Copy – All synchronized (have same version)

Miners

- Special nodes that can hold ledger
- Miners compete among themselves – to validate and add to ledger (check funds)
- Find key – take previous transaction & lock new transaction
- Invest computational power & time
- Gets financial reward (when solved)

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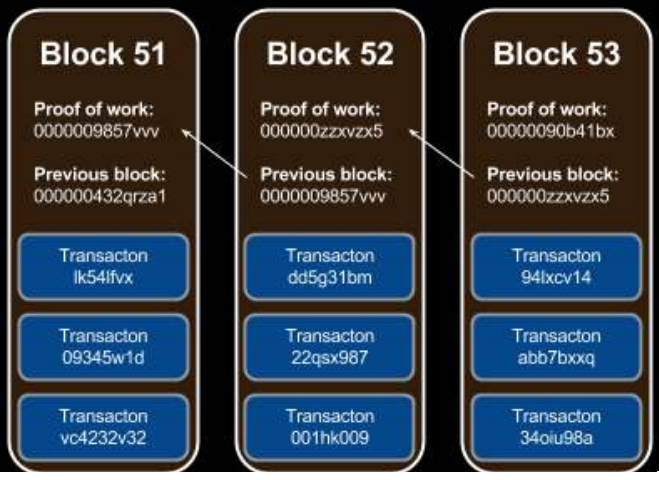
Block Chain

- New group of accepted transactions
- 6 times every hour – blocks made
- Nonce: Arbitrary number may only be used once



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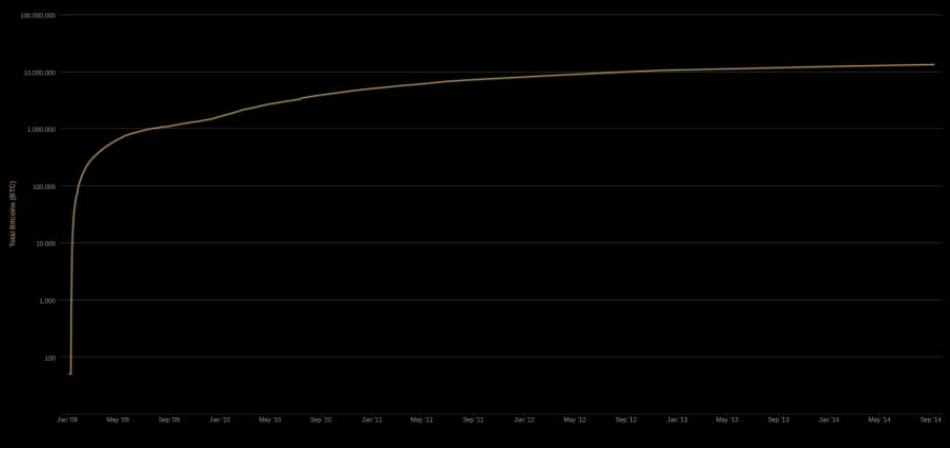
Block Chain – Public Distributed Ledger

- Its not bitcoin but backend of bitcoin
- Ledger is open and public
- Ledger exists in many nodes - decentralized
- Removes dependency on 3rd party
- No trusted entity
- Faster/Immediately
- Cheaper
- For new block – 12.5 BTC
- Every hour $12.5 \times 6 = 75$ BTC
- After 2.1 lakh block (4 years), amount of BTC is halved – ultimately zero BTC – only transaction fee

Bitcoin Circulation

- 21 million bitcoins in 100 years
- About over 13 million bitcoins in circulation by 2014
- 8 million bitcoins will be mined in next 95 years



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History of Cryptocurrency

- 1998: We-Dai – b-money – distributed electronic cash system
- BitGold by Nick Szabo
- 2009: Bitcoin - used SHA-256, a cryptographic hash function, as its proof-of-work scheme
- 2011: Namecoin
- 2011: Litecoin - used scrypt as its hash function
- Peercoin: proof-of-work/proof-of-stake hybrid
- 2014: Treasury

Algorithms

- SHA-2 (Secure Hash Algorithm 2) by NSA - cryptographic hash functions
- Scrypt: Password-based key derivation function – make it difficult to do hardware attacks

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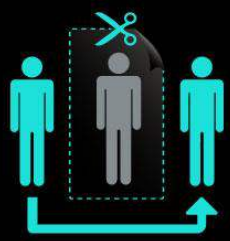
Bitcoin (BTC, XBT or ₿)

- Key and Signature
- Signatures are unique
- By Satoshi Nakamoto
- 31 May 2017: 1 bitcoin = $2257.96 or Rs. 143126.45
- Mathematically limited to 21 million bitcoins



Satoshi

- Satoshi / Austrian – one hundred million of BTC (smallest unit)
- Japanese character シ ("**shi**") - proposed
- Katakana symbol サ ("**sa**") - proposed
- Circled shi (㋿)
- Hiragana shi (し)

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Why Bitcoin Fluctuates?

- Rate in 2010 ($0.08)
- USA (buy – uptick)
- Zambia (sell – downtick) 30 minutes later
- Decrease in Bitcoin rate by:
  - Merchants accepting Bitcoin
  - Miners "cashing out" to pay bills with fiat
  - Redemption of transmission bitcoin
  - Conversion of bitcoin salaries to fiat (increase in unused bitcoin)

Who Accepts?

- More than 1 lakh retailers
- Wallet applications
- Apple
- Dell
- Newegg
- e-Bay
- Dish Network

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Global Scenario

- Japan – Bitcoin made legal (law passed)
- Australia – removed double tax on bitcoin users
- Bangladesh – Illegal – 12 years in jail
- Kyrgyzstan – Illegal (no prohibition from buying and selling)
- Ecuador – banned (creating its own virtual currency)
- Bolivia – Banned
- Vietnam – prohibits credit institutions from dealing in cryptocurrency

Bitcoin in India

- BTCXIndia: 1st bitcoin exchange in India with KYC and AML guidelines
- Unocoin
- Zebpay – 5 lakh app downloads & 2,500 users per day are added
- Fiat is needed to purchase Bitcoin to enter market in India – entry by donations, services or mining
- Still researching on bitcoin to make it legal
- Market acceptance, customer trust, investment security, money laundering, hawala

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Bitcoin Thefts

- **Mt. Gox** –mtgox.com, short for "Magic: The Gathering Online eXchange' in 2006. World's leading bitcoin exchange in 2013-14 - 850,000 bitcoins were stolen which amounted to $450 million & finally bankruptcy declared
- **Bitfinex** - $72 million stolen in Hong Kong based exchange - customers would forfeit 36% of their holdings and be given "BFX tokens" instead that could be redeemed by the exchange or converted to shares in its parent company iFinex.