NFTs are not as complicated as you might think!!!

#blockchaingandalf

A BASIC NFT CONTRACT CONTAINS A TWO COLUMN LIST*:

TOKEN ID	OWNER
1	0xf0950f5a951637e0307cdcb4c672f298b8bc6f29
2	0x9fb2a47fde5bbe18ddd08d17de8bda30ab869cd2
3	0x2a044fea858d6a7ab01fb45c2d104ebae2ea0933
4	0xd053efb1703703ae5bc3dcaddd0d88ebccf6c90b
5	0x7f49f67a538b8ae4123ed2765dc8a028df0dc87e
6	0xef99cc1e4b41488c3a00017b7f45bbbabb21288d
7	0x19b4796f42c006685b69e1b59c4abd0cbd5e91c8
8	0xe8a9a74415cbae81dd9eced463a091ba1c354aec
9	0x16962d78465430915ac360761c22c088c44391e2
...	...

Each NFT in the contract has:

an ID to show which token it is,

an owner, represented by a blockchain public address

* in Solidity, this is called a “mapping”

AN NFT IS THEREFORE JUST A ROW IN A TWO COLUMN SPREADSHEET

That’s basically it.

But there’s more...

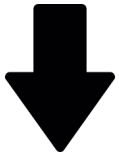
THE NFT CONTRACT ALSO CONTAINS A TRANSFER FUNCTION

A “transfer” simply edits an entry in the “owners” list to be a new address.

It is like a computer program editing a cell in a spreadsheet.

Except the program will only perform the edit if the request is made by the current owner.

2	0x9fb2a47fde5bbe18ddd08d17de8bda30ab869cd2



Request signed by `0x9fb2...cd2`
to change address listed for token 2
to `0x2a04...933`
(for some reason we call this a transfer)

2	0x2a044fea858d6a7ab01fb45c2d104ebae2ea0933

SO WHAT DO I ACTUALLY OWN IF I BUY AN NFT?

If you buy an NFT, what you then own is:

the exclusive right to edit a row in a simple spreadsheet
implemented in a smart contract
on a blockchain,

such that the row has a new owner,

and you lose the exclusive editing right,

and the new owner gains the exclusive editing right.

NFT CONTRACTS ALSO USUALLY CONTAIN A SECOND LIST

TOKEN ID	URI
1	https://www.niftyprimes.com/metadata/1
2	https://www.niftyprimes.com/metadata/2
3	https://www.niftyprimes.com/metadata/3
4	https://www.niftyprimes.com/metadata/4
5	https://www.niftyprimes.com/metadata/5
6	https://www.niftyprimes.com/metadata/6
7	https://www.niftyprimes.com/metadata/7
8	https://www.niftyprimes.com/metadata/8
9	https://www.niftyprimes.com/metadata/9
...	...

In this case each token is also matched to a link to a file on a web server or a decentralized file server

The file is usually a “metadata file”

WHY HAVE METADATA?

It allows us to give the NFT some meaning:

https://www.orthoverse.io/metadata/1:

```
{
    "description": "A picture of a cat",
    "image": "https://www.niftyprimes.com/nft-images/picture-001.png",
    "name": "Special Wizard Cat"
}
```

Although admittedly, sometimes it’s not much meaning...

WHY NOT PUT THE METADATA ON THE CHAIN?

The main reason is because it can be expensive

Most public blockchains are not designed for bulk data storage

A second reason could be that you want to change the data later on

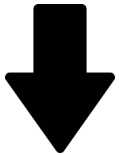
If the data needs to be stored immutably and in a decentralized manner then the IPFS is considered good enough

BONUS: WHAT IS MINTING?

NFT contracts usually contain a “minting” function.

This allows the contract owner to add new rows to the list of tokens:

TOKEN ID	OWNER
1	`0xf0950f5a951637e0307cdcb4c672f298b8bc6f29`
2	`0x9fb2a47fde5bbe18ddd08d17de8bda30ab869cd2`
3	`0x2a044fea858d6a7ab01fb45c2d104ebae2ea0933`



Owner says:
mint new token and give it to `0xd053e...90b`

TOKEN ID	OWNER
1	`0xf0950f5a951637e0307cdcb4c672f298b8bc6f29`
2	`0x9fb2a47fde5bbe18ddd08d17de8bda30ab869cd2`
3	`0x2a044fea858d6a7ab01fb45c2d104ebae2ea0933`
4	`0xd053efb1703703ae5bc3dcaddd0d88ebccf6c90b`

Some contracts only allow minting when they are created
Others allow you to mint whenever you feel like it

BONUS: WHAT ABOUT ROYALTIES?

These are tricky.

A percentage fee has problems:

What if the owner is transferring between their own addresses?

What if the fee is paid “out of band”, e.g. using a bank transfer?

Royalties are usually handled by the NFT auction site,
separately from the actual NFT transfer

In that sense, they’re like royalties from art
selling through an auction house

BUT WHAT DOES IT MEAN?

The mechanics of NFTs are *ridiculously* simple

But then … so are the mechanics of
vehicle registries, land registries,
patent ownership databases, copyright registries,
property titles, degree certificates, voting rights,
carbon credits, canvases with paint on them,
baseball cards, trademark lists, concert tickets,
club membership
...

It’s the meaning we decide to give them that actually provides the value