**GBP-13 Define token format (GRC721)**

**I. Overview**

- GRC721 token format is based on GRC20 token format, and the smart contract is written in decorated JavaScript (djs).

- It contains many state variables:

* \_name [1]
* \_symbol [2]
* \_owners [3]
* \_balances [4]
* \_tokenApprovals [5]
* \_operatorApprovals [6]

And methods:

* constructor(name\_ : string, symbol\_ : string) [1]
* balanceOf(owner : string) : number [2]
* ownerOf(tokenId : number) : string [3]
* name() : string [4]
* symbol() : string [5]
* approve(to : string, tokenId : number) [6]
* getApproved(tokenId : number) : string [7]
* setApprovalForAll(operator : string, approved : boolean) [8]
* isApprovedForAll(owner : string, operator : string) : string [9]
* transferFrom(from : string, to : string, tokenId : number) [10]
* \_exists(tokenId : number) : boolean [11]
* \_isApprovedOrOwner(spender : string, tokenId : number) : boolean [12]
* \_mint(to : string, tokenId : number) [13]
* \_burn(tokenId : number) [14]
* \_transfer(from : string, to : string, tokenId : number) [15]
* \_approve(to : string, tokenId : number) [16]
* \_beforeTokenTransfer(from : string, to : string, tokenId : number) [17]

**II. Contract State**

**[1]:** Token name

**[2]:** Token symbol

**[3]:** Mapping from token ID to owner address

**[4]:** Mapping owner address to token count

**[5]:** Mapping from token ID to approved address

**[6]:** Mapping from owner to operator approvals

**III. Contract’s Methods**

[1]: Initializes the contract by setting a `name` and a `symbol` to the token collection.

[2]: check balances of an account address

[3]: owner of a token

[4]: name of token

[5]: symbol of token

[6]: approve token to other account

[7]: check approval of a token

[8]: set approval for a token

[9]: check wether a account is operator of another’s toke

[10]: transfer token from an account to others.

[11]: check if a address existed

[12]: check if a account own or is approved for a token

[13]: mint a tokenId

[14]: burn a tokenId

[15]: transfer token from an account to others

[16]: approve token for an account.

[17]: do something before transfering token.