



We Are All Winners (SBT)

Kentucky Derby Horse Winners as Soulbound Tokens for Columbia Fintech Bootcamp Graduates





Executive Summary: WAAW Token

1

With no direct Columbia Fintech Bootcamp Alumni Network, our development team looked to connect bootcamp graduates in a unique way: the implementation of soulbound tokens.

2

A soulbound token is an NFT that cannot be transferred, meaning you hold the sole wallet forever.

3

In light of the warming weather and derby season, our development team focused on creating SBTs of past Kentucky Derby Horse Winners.

4

Each Horse NFT contains specific attributes, including names, color, year, number, face, and jockey to satisfy what each graduate likes in a horse.

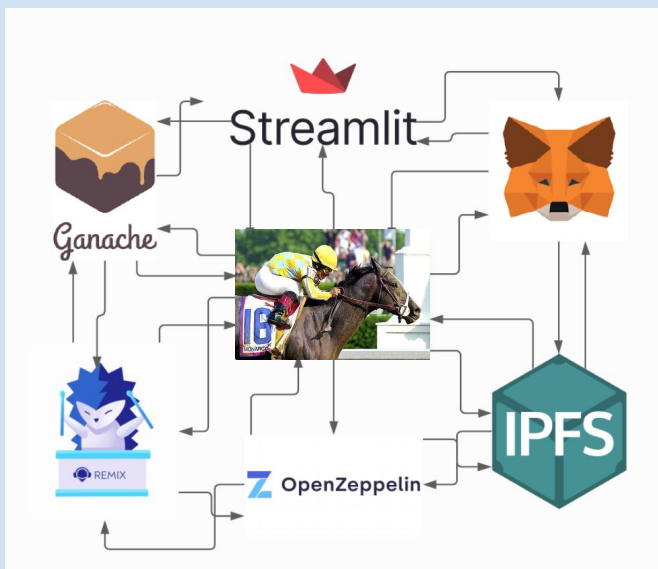




Data Collection & Preparation



- ERC721 Contract & Interaction
 - Reviewing ERC721 contract templates and making project-specific edits.
 - Establish reliable wallet and visual connection to the functional frontend.
- Horse Information
 - Research was conducted and collected on 40 past Kentucky Derby Winners, using physical and background information.
 - The attributes for each horse were to be stored in json files.
- Frontend Display
 - Research options to connect our smart contract to an operable interface.
 - For demo purposes, research relevant libraries to create a mock frontend through Streamlit.
- Implementation of Approach
 - Develop a way for bootcamp graduates to access their WAAWToken NFT for free without recipient minting.



Smart Contract

- Use solidity for ERC721
- Preminted
- Transfer disabled
- IPFS - Pinata
- Permanent metadata via JSON
- Deployed in Polygon Testnet
- ThirdWeb SDK for Marketplace
- OpenZeppelin Defender Gasless transactions
- Alchemy for provider

```
WAAWSBT.sol 3 X
smart_contract > WAAWSBT.sol
1 // SPDX-License-Identifier: MIT
2 pragma solidity ^0.8.2;
3
4 //import Open Zeppelin contracts
5 import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
6 import "@openzeppelin/contracts/utils/Counters.sol";
7 import "@openzeppelin/contracts/utils/Strings.sol";
8
9 contract NFT is ERC721 {
10     using Counters for Counters.Counter;
11     Counters.Counter private currentTokenId;
12
13     constructor() ERC721("WAAWToken", "WAAWT") { }
14
15     // needs to be unlocked for the `_mint()` function in constructor
16     bool locked = false;
17
18     function setLocked(bool _locked) external {
19         locked = _locked;
20     }
21
22     function _beforeTokenTransfer()
23     {
24         address from,
25         address to,
26         uint256 tokenId
27     } internal override {
28         require(!locked, "Cannot transfer - currently locked");
29     }
30
31     //use the mint function to create an NFT
32     function mint()
33     public
34     returns (uint256)
35     {
36         currentTokenId.increment();
37         uint256 newItemId = currentTokenId.current();
38         _mint(msg.sender, newItemId);
39         return newItemId;
40     }
41
42     //in the function below include the CID of the JSON folder on IPFS
43     function tokenURI(uint256 _tokenId) override public pure returns(string memory) {
44         return string(
45             abi.encodePacked(
46                 "https://gateway.pinata.cloud/ipfs/QmdRsCBwY7sCwdXro41HrtqaaR18BgaUDP8aNTm4Q9n8Ex/",
47                 Strings.toString(_tokenId),
48                 ".json"
49             )
50         );
51     }
52
53     // this event freezes the metadata so is no longer changeable by anyone
54     event PermanentURI(string _value, uint256 indexed _id);
55 }
```

Sell



Name - qdp5LSPH3J

Mark Test

Owned by you 2 views

Price History

All Time



No item activity yet

Listings

Offers



No offers yet

Description

Created by you
Kentucky Derby winner

Your transfer has processed!

You just transferred Mark Test. It's been confirmed on the blockchain!



Status Transaction Hash

Complete 0x9717...faba



Polygon Testnet



Connected

Polygon

0xF26...5EA7



0.377 MATIC



Buy



Send



Swap

Assets

Activity



Mint

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-0 MATIC

-0 MATIC

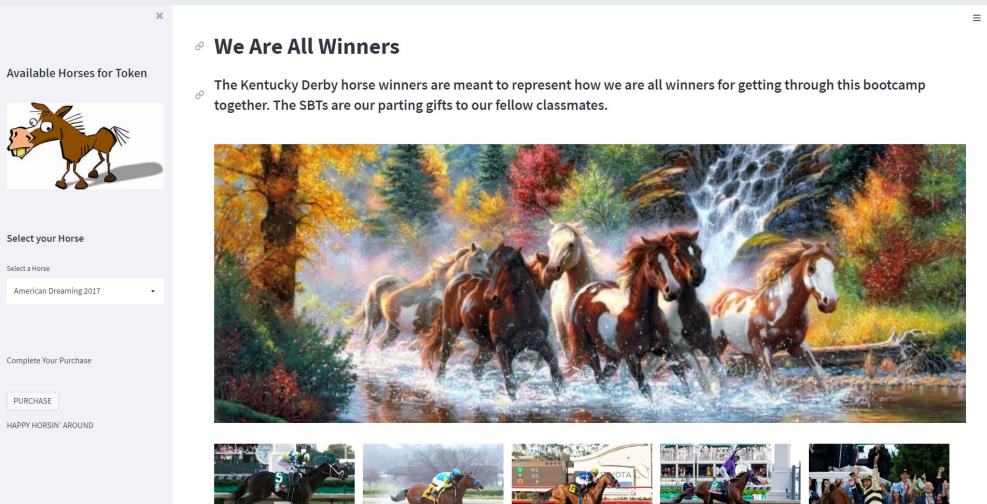


Mint

May 27 · remix.ethereum.org

-0 MATIC

-0 MATIC



```
# Row layout to display each NFT image
# Row A
a1, a2, a3, a4, a5 = st.columns(5)
a1.image(Image.open('We Are All Winners Images/Always Dreaming 2017.png'), caption = 'Always Dreaming 2017')
a1.write("Always Dreaming broke well and settled just behind the early leader State of Honor with good position on t
a1.write("### Value : 10 ETH")
a1.write("")

a2.image(Image.open('We Are All Winners Images/American Pharoah 2015.png'), caption = 'American Pharoah 2015')
a2.write("American Pharoah has won the 141st Kentucky Derby before a record-setting crowd at Churchill Downs.Victor
a2.write("### Value : 5 ETH")
a2.write("")

a3.image(Image.open('We Are All Winners Images/Authentic 2020.png'), caption = 'Authentic 2020')
a3.write("Authentic is by super stud of the moment, Into Mischief. Into Mischief boasts of other progeny you may hea
a3.write("### Value : 6 ETH")
a3.write("")

a4.image(Image.open('We Are All Winners Images/California Chrome 2014.png'), caption = 'California Chrome 2014')
a4.write("For decades it was California dreamin to think that a horse from the Left Coast could win the Kentucky De
a4.write("### Value : 7 ETH")
a4.write("")

a5.image(Image.open('We Are All Winners Images/Country House 2019.png'), caption = 'Country House 2019')
a5.write("Country House has faced several of his Kentucky Derby (G1) rivals in his past three races. The Bill Mott-t
a5.write("### Value : 7 ETH")
a5.write("")

# Row B
```

Streamlit Mock Frontend

- Streamlit
- PIL
- Style.css

```
# General title
st.title("We Are All Winners")
st.markdown("### The Kentucky Derby horse winners are meant to represent how we are all winners
st.text(" \n")

# Real NFT page link for demo

url = "https://sbt-columbia-2022.vercel.app/"

# Sidebar construction
st.sidebar.markdown("# Available Horses for Token")
st.sidebar.image('profile.png')

st.sidebar.write("")
st.sidebar.write("")
st.sidebar.write("")

st.sidebar.markdown("## Select your Horse")
st.sidebar.write("")

st.sidebar.selectbox('Select a Horse', horses)

st.sidebar.write("")
st.sidebar.write("")
st.sidebar.write("")
st.sidebar.write("")
st.sidebar.write("")

st.sidebar.markdown("Complete Your Purchase")
st.sidebar.write("")
st.sidebar.write("")

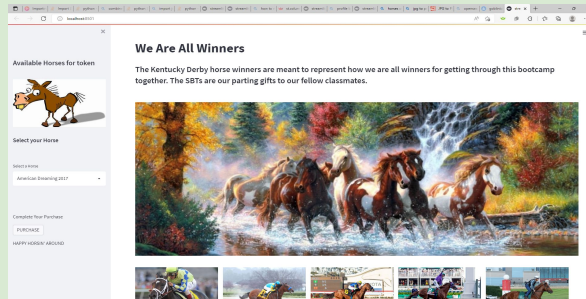
if st.sidebar.button(label = 'PURCHASE'):
    st.sidebar.markdown(url, unsafe_allow_html=True)
else:
    st.sidebar.write("HAPPY HORSIN' AROUND")

# Team logo

st.image('running-horses.png', width =1450)
```

Streamlit Demo & Functional Opensea Page

0
1

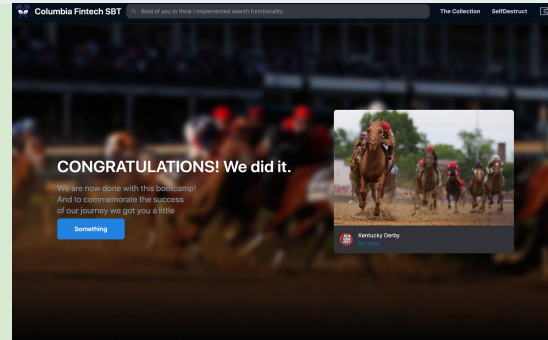



Frontend using Streamlit

Using the Streamlit library, an NFT page for token purchases can be designed. Here, we have designed a mock Streamlit page to display layouts and potential sidebar interactions.

Functional Frontend with Next.js

For a functional page for this project that implements our SBT smart contract with disabled transfer and gasless transactions we recreated OpenSea UI with Next.js, Tailwind, and Sanity





Results, Conclusions, & Next Steps

This was a very ambitious blockchain app given the short amount of time. With more time we want to accomplish the following to further develop our SBT collection and dApp SBT Marketplace

1. SBTs create unique membership ID tokens which can be used as non-transferable avatars for membership in a social metaverse community for networking, employment reasons and as a meet up space for alumni to discuss future startups and organize hackathon meetups.

We feel that our SBT Marketplace is a relevant app to enter the blockchain space for several reasons:

1. It gives users a chance to experience the non monetary potential of smart contracts since the trade value of the asset has been disabled.
2. SBTs create unique membership ID tokens which can be used as non-transferable avatars for membership in a social metaverse community for networking, employment reasons and as a meet up space for alumni to discuss future start-ups and organize hackathon meet-ups.
3. The closed SBT marketplace offers a solution to the fraudulent and copy collections that NFT websites like Opensea face.



Development Team



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Questions from the class? Ask us!

GitHub: <https://github.com/m4rker11/SBT-Columbia-2022>