

Problem

Cryptocurrency has become a booming tradeable currency in the past couple years and continues to expand. One of the major ways cryptocurrency is used is with the monetization of unique Non-Fungible Tokens (NFT's). NFT's are a type of data which is stored to a specific crypto's public blockchain and is stored as a unique asset. NFT's are digital items which users can create, buy and sell on NFT marketplaces, with the use of cryptocurrency. Established NTF marketplaces have some problems, the main ones being the cost and ineffective user interface and experience. Our teams marketplace, NFTies Marketplace, is user a friendly marketplace that will help assist in the creation of NFT's by making the process seamless and less expensive for the users who have created NFT's before and those who are only getting started.

Current System

The current system for our application includes groundwork for smart contracts and basic features for the front-end and back-end. The NFTies collective market place team was split into 3 sub teams: Crypto, Back-end and Front-end. The crypto team's current system includes 2 different types of smart contracts for ETH, each with the ability to mint an NFT to a testnet. Both smart contracts are ERC721 though can be updated to ERC1155 for more accessibility and cheaper gas costs. The Front-end team's current system includes implementation with React.js and Bootstrap in order to create the different web pages necessary. The back-end team worked with Django and Python in order to create the routes and paths to connect the front end to the back-end logic.

Requirements

What was worked on:

This Fall 2021 semester I was part of the Back-End team. The back-end team worked with Django and Python in order to create the routes and paths to connect the front end to the back-end logic. The front-end team worked with React.js and Bootstrap in order to create the different web pages necessary for our NFT Marketplace. The NFT team was able to create a smart contract that successfully mints to a test network.

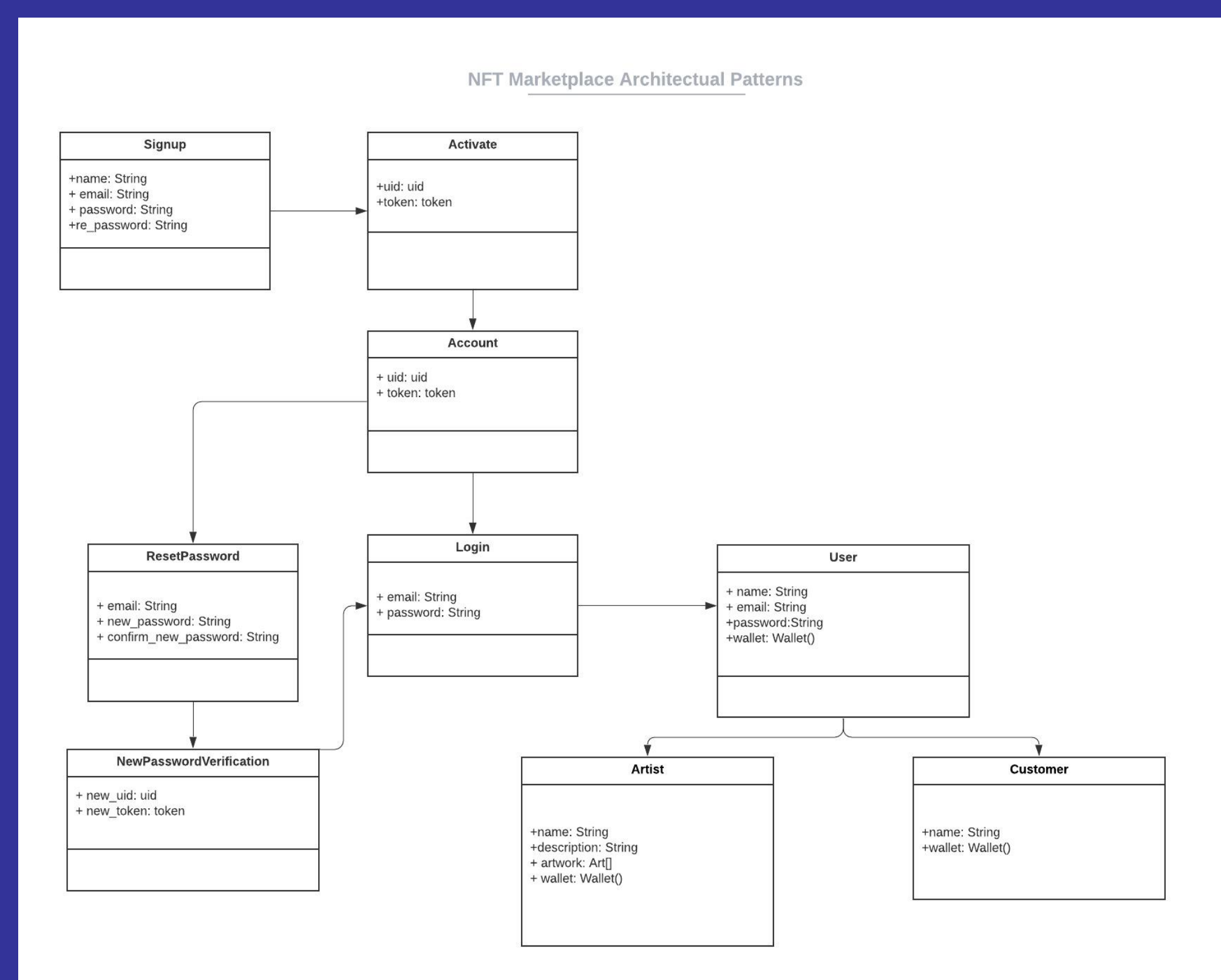
System design:

- **Front-End:** React.js, CSS, HTML, Javascript
- **Back-End:** Python, Django
- **Database:** PostgreSQL/PostgreSQL Terminal
- **Crypto:** Ethereum, solidity based smart contracts

System Design



Object Design



Implementation

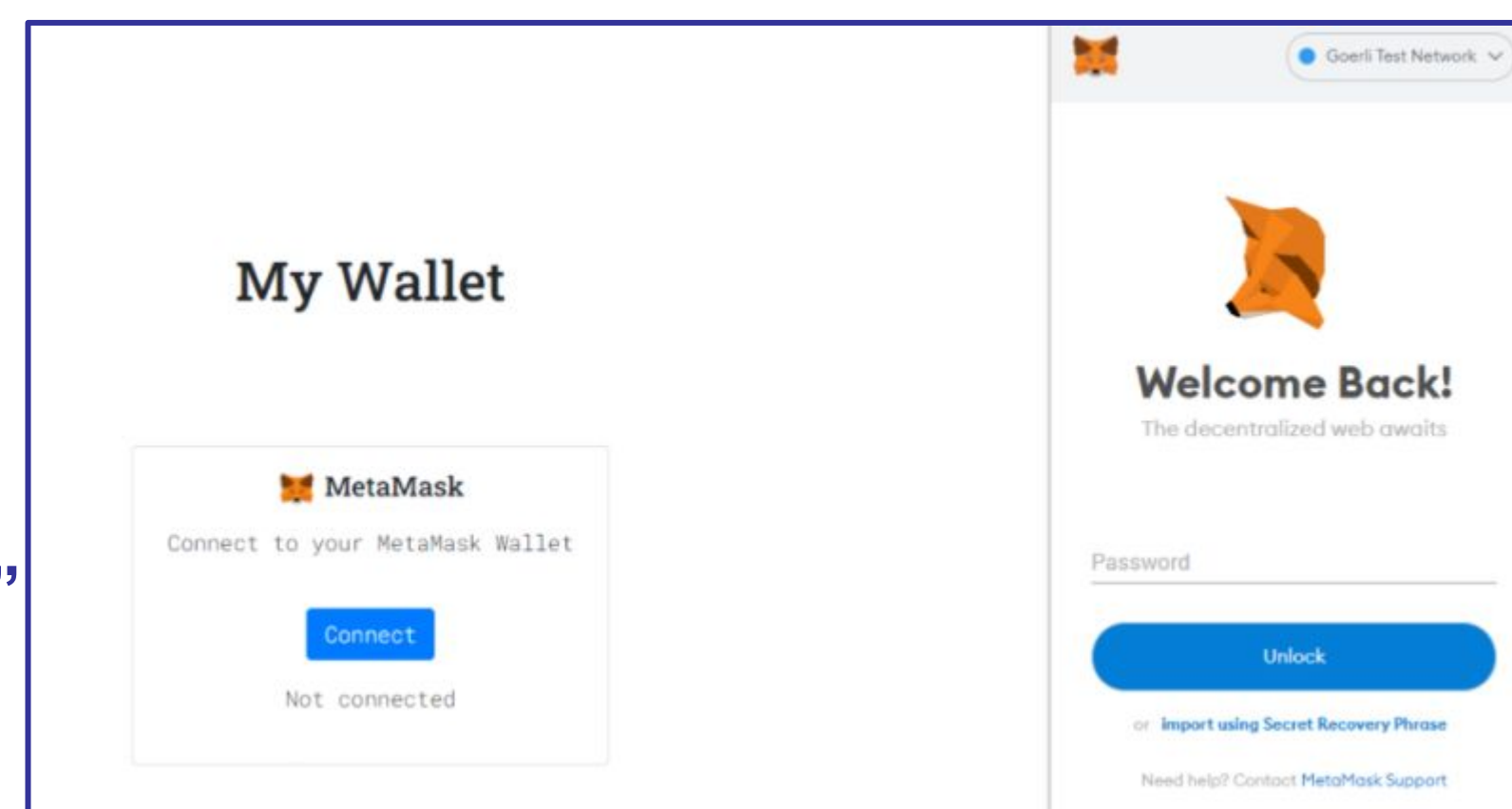
- **Backend:** Implemented in Python and Django
- **Frontend:** Created in React.js with HTML and CSS
- **Database:** The Database which we decided to use was PostgreSQL.
- **Crypto:** Solidity language is used for ethereum smart contracts

Verification

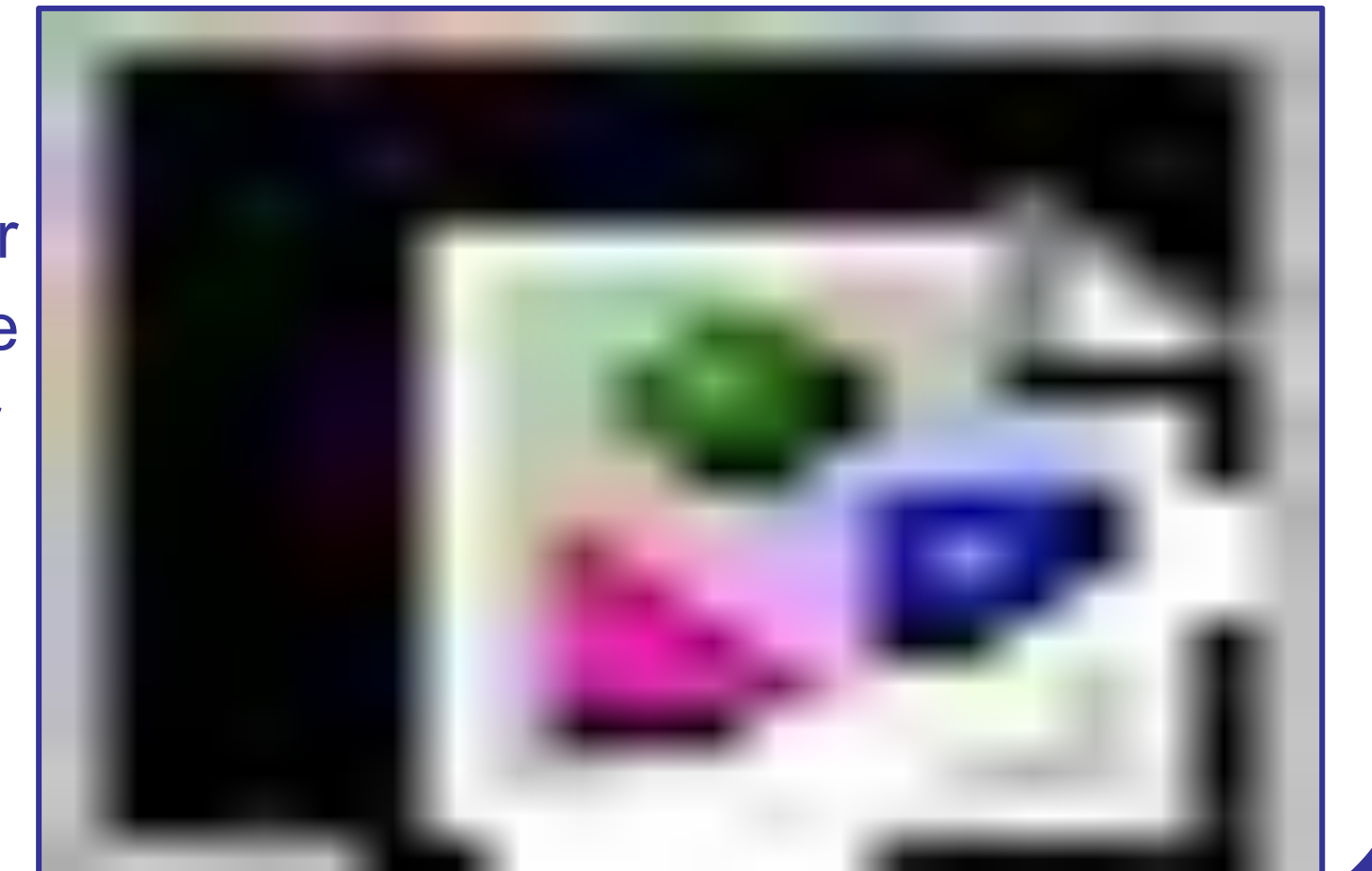
We used a web console and Visual Studio Code for debugging and testing the back-end. We also showed the PO progress during the semester to let him know where we are in development. Also we used Remix IDE and OpenSea test-net for testing and coding purposes for the NFT side.

Screenshots

(1) This screenshot shows the MetaMask Wallet for our project. Reference "Current System"



(2) This screenshot shows the NFT Lister for our project, where an artist can list their NFT. Reference "Current System"



Summary

The NFTies collective team was able to make ongoing effective progress through the Fall 2021 semester based on the strong foundation created during the Summer 2021 semester which proved effective in the extensive research on crypto currency implementation, NFT creation and minting, along with a number of other related topics. With the NFTies collective marketplace, countless artists will be able to post their unique art and have the opportunity to monetize on their talents in an easy and effective manner. The team undoubtedly made serious progress through the creation of 2 minting smart contracts, ERC721, which will be used to mint NFTs. Looking forward to next steps, the future team will have the opportunity to update and test the contracts.

Acknowledgement

I would like to thank Professor Masoud Sadjadi, teacher assitants Azwad Islam and Sumesh Kumar, and the product owner Eddie Garcia for their assistance and mentorship throughout the senior design project.