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Mint Your Music

# Overview of the Project

For the final project, I developed a website called *Mint Your Music* that allows users to upload their own songs and cover images to blockchain for sell. The website will ask the user to login to *MetaMask* (a software cryptocurrency wallet), fill out information of the song he or she created, and upload mp3 file of the song as well as a *jpeg* file as the cover image of the song. At last, the website will upload the information to IPFS, a distributed system for storing and accessing files, websites, applications, and data, and mint the song, so that the users can check out their songs on *OpenSea*, the world's first and largest digital marketplace for crypto collectibles and non-fungible tokens (NFTs) and sell their works.

Link of the website is <https://mint-your-music.web.app/home>. The code can be downloaded from my Github repository: <https://github.com/Lorenayannnnn/mint-your-music>.

This document will be broken down into the following sections and discuss this project in more details:

1. [Terminologies](#_Terminologies): explain definition of blockchain-related terminologies that are used by this project and this document.
2. [Website Development](#_Website_Development):
   1. [Illustrate how to use this website with screenshots.](#_How_to_use)
   2. [Website development and minting process](#_Website_Development_and)
3. [Motivation of developing this website](#_Motivation_of_Creating)
4. [Future Implication](#_Future_Implication): what I want to achieve in the future

# Terminologies

* Blockchain:
  + Blockchain is a distributed digital ledger of transactions that is duplicated and maintained by the entire network of computers on the chain. Because all transactions are verified by all computers instead of relying on a 3rd party platform, it will be extremely difficult to change the records and thus the transparency and security of all transactions are enhanced by blockchain.
  + This project is using Ethereum blockchain. To be more specific, Rinkeby is used, which is an Ethereum test network. The reason for using the test network instead of the official public network is because this website is for final project of MUSC-102 course, so that when the user is minting their music, it won’t require any gas fee.
* Gas fee: Gas fee are payments that the user needs to pay in order to compensate energy required to validate the transaction given that the blockchain is a purely distributed system.
* NFT: NFT stands for non-fungible token, which is a digital unit that is stored on blockchain. NFT includes various forms, such as photos, music, videos, etc., and they are all non-interchangeable. For instance, if you have 1 bitcoin (a digital currency), you can exchange it for another bitcoin, as they have the same value. However, a song that is composed by someone is unique and thus has a unique value. It cannot be exchanged for another photo or song.
* MetaMask: a software cryptocurrency wallet that a user can use to interact with the Ethereum blockchain.
* IPFS: IPFS is a distributed file system for storing and sharing data.
* Rinkeby: Rinkeby is a chain of Ethereum for testing, so that no gas fee will be required from the user, but in order to actually sell the NFTs, the user needs to switch to the Polygon chain and connect his or her cryptocurrency wallet to the public net of OpenSea, which is not available on this website.
* Contract: it’s a program stored on blockchain that is used to automatically check all conditions (such as rules for legally transferring the ownership of an NFT) are met before a transaction is executed and documented. Before selling any NFT, a contract needs to be deployed and is needed to mint all NFTs, so that the user can then trade NFTs in a safe environment.
* OpenSea: It’s the world's first and largest digital marketplace for crypto collectibles and NFTs.

# Website Development

## How to use the Website

1. Download MetaMask extension in Google Chrome Store and sign up your wallet account.
2. Go to <https://mint-your-music.web.app/home>
3. Click “Get Started” or “Login with MetaMask” to continue

Graphical user interface, application, Teams

Description automatically generated

1. If you are not login to MetaMask, a pop-up window should display.

Graphical user interface, text, application, chat or text message

Description automatically generated

1. After login, you will be directed to the page that ask you to fill out information of your song. Fill our artist’s name (or your name), title of the song, description, genre, and instrument used in the song. Then, click “upload your song”.

Graphical user interface, text, application

Description automatically generated

1. Fill our collection Info: each user can have different collections that contains different NFTs on OpenSea. You can choose either create a new collection by entering the name you want or use an existing collection by entering the address of the contract of the collection. Then, click “next”.

Graphical user interface, text, application, Teams

Description automatically generated

1. Upload files: On this page, you can upload the mp3 file of your music as well as a JPG cover image. At last, you can click “Mint Your Song” to start the minting process.

Graphical user interface, application, Teams

Description automatically generated

This process may take a while. Please be patient ☺.

1. After your song is successfully minted, you will be directed to a page that explains “what to do next”, and you can go to the test net of OpenSea and checkout your work. Detailed instructions are on this page: <https://mint-your-music.web.app/minted>

Graphical user interface, application, Teams

Description automatically generated

## Website Development and Minting Process

### Website Development

* The website is developed with HTML, CSS, JS with Vue framework for frontend
* A 3rd party API for interacting with the blockchain is used: <https://docs.nftport.xyz/>
* Firebase is used for website deployment.
* Code can be downloaded from Github: <https://github.com/Lorenayannnnn/mint-your-music>

### Minting Process

1. Mp3 and the cover image are uploaded to IPFS.
2. If user chooses to create a new collection, a new contract will be deployed to his MetaMask owner address (address where his account data is stored on the Ethereum blockchain). If not, the user needs to enter the address of his or her collection/contract.
3. A metadata of the NFT will be created, including information such as name of the NFT (i.e., name of the song), artist name, attributes like genre and used instruments of the song, and most importantly the IPFS addresses of the mp3 file and the cover image.
4. The metadata will be uploaded the IPFS as well.
5. Finally, the NFT will be minted to the specified/created contract address on Rinkeby chain of Ethereum.

# Motivation of Creating this Website

As someone who is majoring in CS, I’m very interested in Blockchain, NFT, and Web3 in general. Also, for one of the analytical essays, I focused on how the recommendation algorithms of 3rd party centralized platform such as Spotify can positively and, more importantly, negatively affect or even control the popularity of all the artists. Facing the fact that all financial reward transactions and streaming data processing are solely done by these 3rd party platforms, not only fans cannot directly support their favorite artists, but also, the popularity of the artists may be greatly dependent on the interests of the business corporations and celebrities. For instance, stars that are more popular may be easier to gain more financial rewards from those platforms because of their power and high social statuses.

Therefore, given that the blockchain provides a transparent and safe environment for transaction processing, using the blockchain system to replace 3rd party music platforms is definitely beneficial and revolutionizing, because not only the general public can have more power and rights over the music industry instead of being almost fully controlled by certain conglomerates, but also, it will make the competitions among both popular stars and new artists much more fair, which is my main motivation of creating this project.

# Future Implication

Revolutionizing the society with Blockchain and Web3 in general is unstoppable. With the power of blockchain and decentralization, I want to bring equality to the music industry. Not only the fans can use their own power and money (e.g.: cryptocurrency like bitcoins) to support their favorite artists, but also, this system will give artists more motivation to innovate and bring new and better music to the society, because they can receive direct rewards from the audience instead of being controlled by centralized platforms, and the copyright of their works will be even more protected by the transparency of documenting transactions of NFT ownership through blockchain.