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**Securing Literary Works: A Blockchain-Enabled QR Code Solution for Copyright Protection and Anti-Piracy in Publishing**

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**Abstract:**

In order to establish a safe and dependable system for book ownership, this project investigates the combination of blockchain technology and QR, NFT codes. The main goal is to create a system in which every book has a unique blockchain registration and whose ownership can be verified with a QR code scan. By using this technique, duplicates and forgeries are avoided as it guarantees that a book can only be confirmed to belong to a specific person once.

Each book is given a special QR code upon purchase, which is connected to a blockchain entry that contains the owner's details as well as the book's content. The mechanism verifies the legitimacy and ownership status of the book by cross-referencing the blockchain with the scanned QR code. By offering an unchangeable record of ownership and making verification simple, this procedure improves confidence and transparency.

The idea uses the tamper-proof and decentralised properties of blockchain technology to tackle counterfeit and book piracy. Owners, purchasers, and other parties can more easily verify the authenticity of the book and its owner by using QR codes, which makes the process easier. This novel strategy fosters confidence in the market for both physical and digital books while safeguarding intellectual property rights.

**Problem:**

This project's main focus is on the problem of book piracy and counterfeiting, which jeopardises the integrity of intellectual property rights and book ownership. Because traditional ownership verification techniques are easily copied and forged, it can be challenging to determine whether a book is real and who the true owner is. The goal of this project is to establish a safe, unhackable system by fusing blockchain technology with QR and NFT codes. Every book is given a distinct QR and NFT code that is connected to a blockchain entry. This makes it easy and reliable to validate ownership, reducing unwanted duplications and boosting confidence in the ownership verification procedure.

**Contracts:**

The NFT-based book ownership contract (BookOwnership) and the QR code management contract (QRCode) are the two primary smart contracts in our project. With blockchain technology, every contract has a specific function in the management of books and the data that goes with them.

**QRCode Contract:** The goal of the QRCode contract is to manage book registration and management, including making sure that a book's QR code can only be scanned once. This contract offers features for adding new books, getting book details, and monitoring QR code scanning progress.

**Key Components and Functions**

Manager: A manager with administrative rights oversees the contract; this manager is usually the contract deployer.

Book struct: This structure shows the information about a book, including its ID, title, author, publishing house, cost, and page count.

Mappings:

books: connects every book ID to the appropriate book struct.   
qrScanned: Monitors the scanning status of a QR code associated with a particular book.

Events:  
When a book's QR code is scanned, the code QRCodeScanned is released.

Modifiers:

onlyAdmin: Guarantees that specific actions can only be taken by the manager.   
Uses:   
addBook: Enables the manager to update the system with a new book.   
getBookDetails: This function returns a book's details based on its ID.   
scanQRCode: This function indicates when a QR code has been scanned by emitting an event.   
isQRCodeScanned: Determines whether a QR code has been scanned for a certain book.

**BookOwnership Contract:** The purpose of the BookOwnership contract is to handle book ownership as NFTs, or non-fungible tokens. With a focus on upholding a safe and open record of ownership, it provides features for minting new books, transferring ownership, and retrieving book details.

**Key Components and Functions**

Book Struct: This structure is a representation of a book that has fields for the ID, title, author, publishing house, cost, page count, owner address, and existence indicator.   
Books: Maps every book ID to the appropriate Book struct.   
Mappings:   
Emitted upon the minted of a new book, BookMinted.   
Events:   
Anyone can mint a new book NFT using mintBook, as long as the book ID is unique. The caller is given ownership via this function.   
transferOwnership: Enables a book's present owner to assign ownership to a different address.   
getBookDetails: Returns a book's details, including ownership details, based on its ID.