Homework 6 answers

Answer Badger NFT

Badger NFT

We now want to create an NFT. You can use the Open Zeppelin libraries to help with this.

1. Create a new project in the IDE of you choice called NFTProject
2. Create a BadgerNFT contract this should inherit from any ERC721 implementation from the Open Zeppelin standard libraries

```
// forge install OpenZeppelin/openzeppelin-contracts
// Remember to update remappings.txt
import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/utils/Counters.sol";
```

3. Give your NFT a name and a symbol.

```
contract BadgerNFT is ERC721 {
    using Counters for Counters.Counter;
    Counters.Counter private _tokenIds;

    constructor() ERC721("BadgerNFT", "BN") {

    }

    function mint() public returns (uint256) {
      _tokenIds.increment();
      uint256 newItemId = _tokenIds.current();
      _mint(msg.sender, newItemId);
      return newItemId;
    }

}
```

4. Write unit tests to check that you can
5. Mint new NFTs
6. Transfer an NFT

```
// SPDX-License-Identifier: UNLICENSED
pragma solidity ^0.8.18;

import "forge-std/Test.sol";
import "../src/BadgerNFT.sol";

contract BadgerNFTTest is Test {
    BadgerNFT public nft;
    address alice = address(1);
    address bob = address(2);
    uint256 tokenId;

    function setUp() public {
        nft = new BadgerNFT();
    }

    function testMint() public {
        vm.startPrank(alice);
        tokenId = nft.mint();
        assertEq(tokenId, 1);
        assertEq(nft.ownerOf(1), alice);
        assertEq(nft.balanceOf(alice), 1);
        vm.stopPrank();

        vm.startPrank(bob);
        tokenId = nft.mint();
        assertEq(tokenId, 2);
        assertEq(nft.ownerOf(2), bob);
        assertEq(nft.ownerOf(1), alice);
        assertEq(nft.balanceOf(alice), 1);
        assertEq(nft.balanceOf(bob), 1);
        vm.stopPrank();
    }

    function testTransfer() public {
        vm.startPrank(alice);
        tokenId = nft.mint();
        nft.transferFrom(alice, bob, tokenId);
```

```
        assertEq(nft.ownerOf(tokenId), bob);
        assertEq(nft.balanceOf(alice), 0);
        assertEq(nft.balanceOf(bob), 1);
        vm.stopPrank();
    }
}
```

5. Deploy your contract to the test network and send some NFTs to your colleagues.

```
forge create --rpc-url <your_rpc_url> \
    --private-key <your_private_key>
src/BadgerNFT.sol:BadgerNFT \
```