Blockchain & Solidity Lab3 – Crowdfunding dApp Development

S2BC

Lab 3: Integrate Web App with Smart Contracts

- BUILD / TEST / **INTEGRATE** / RUN

Objective: The aim of this Lab3 is to integrate the smart contracts you developed in Lab1 and Lab2 with a Crowdfunding dApp for users to access the dApp using the web browser.

Deploy Compiled Smart Contract with Hardhat

To deploy the compiled contract to the Ethereum blockchain network, follow these steps:

Step 1: Configure a dotenv (.env) file

First, install the `dotenv` package using the following command:

```
npm install dotenv
```

Next, create a `.env` file in the root folder of your HardHat project.(hardhat/.env) This file will contain sensitive information that should be kept secure. Add the following variables to the `.env` file:

```
# This is the URL of the Ethereum RPC provider
RPC_URL="https://example.com/rpc" (optain from morpheus)

# This is a private key for signing transactions (private key of the
deployer account)
PRIVATE_KEY="your_private_key_here"

# This is the chain ID for the Ethereum network
CHAIN_ID=12345
```

Make sure to replace the placeholder values with your actual credentials.

Step 2: Configure hardhat.config.js

Modify your `hardhat.config.js` file as follows:

```
require("@nomicfoundation/hardhat-toolbox");
require("dotenv").config();

/** @type import('hardhat/config').HardhatUserConfig */
module.exports = {
  solidity: "0.8.22",
  networks: {
    // Add your network configuration here
    poa: {
      url: process.env.RPC_URL, // RPC URL of your network
      chainId: parseInt(process.env.CHAIN_ID), // Chain ID of your network
      accounts: [process.env.PRIVATE_KEY], // Array of private keys to use
with this network
    },
  },
};
```

Step 3: Create a Deployment Script

Create a new file named `deploy.js` inside the `hardhat/scripts` directory. Add the following content to the file:

```
const { ethers } = require("hardhat");
const fs = require("fs");

async function deployCampaignCreator() {
  // Get the deployer's address
  const [deployer] = await ethers.getSigners();
  console.log(
    "Deploying CampaignCreator contract with the account:",
    deployer.address
  );

  // Get the CampaignCreator contract factory
  const CampaignCreator = await
ethers.getContractFactory("CampaignCreator");

  // Deploy the CampaignCreator contract
  const campaignCreator = await CampaignCreator.deploy();
  // console.log(campaignCreator.target);

  // Save deployment information to a text file
  const deploymentInfo = `Deployer Address:
${deployer.address}\nCampaignCreator Contract Address:
${campaignCreator.target}`;
  console.log(
```

```
      `CampaignCreator Contract Address deployed: ${campaignCreator.target}`
    );
    fs.writeFileSync("deploymentInfoCampaignCreator.txt", deploymentInfo);

    // Return the deployed CampaignCreator contract instance
    return campaignCreator;
  }

  async function main() {
    try {
      // Deploy the CampaignCreator contract
      const campaignCreator = await deployCampaignCreator();

      console.log("Deployment completed successfully!");
    } catch (error) {
      console.error("Error deploying contracts:", error);
      process.exitCode = 1;
    }
  }

  main();
```

To deploy the contracts, use the following command in your terminal:

```
npx hardhat run scripts/deploy.js --network poa
```

The result output from the terminal will provide the contract addresses.

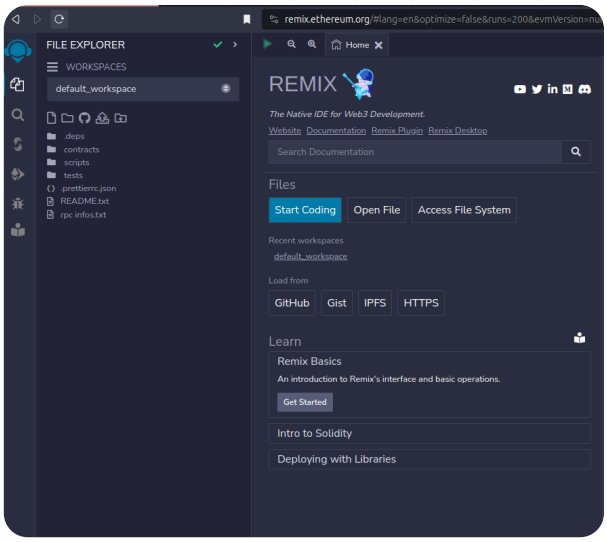
A "deploymentInfoCampaignCreator.txt" file will be created with the CampaignCreator contract address.

That is what you will need to add to the ".env.local" file in the front-end later on.

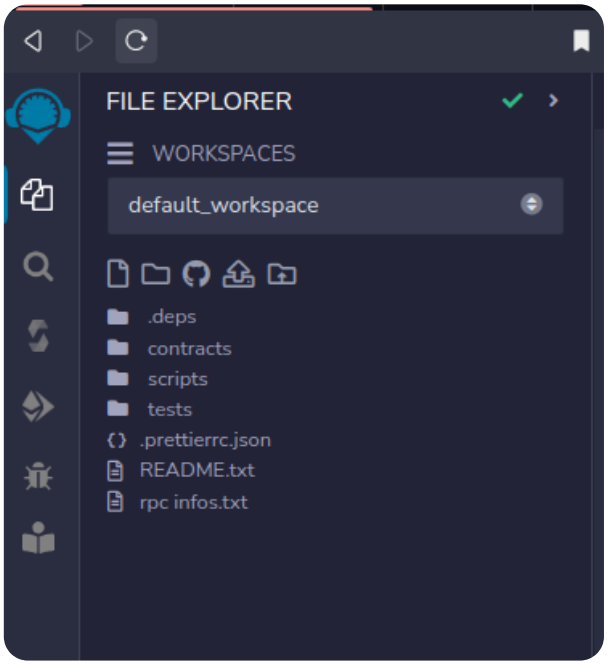
Try Your Contracts on Remix IDE

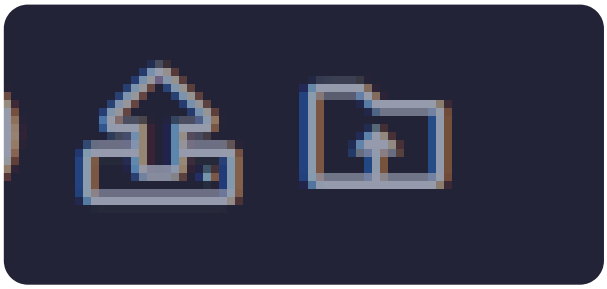
Remix IDE provides a visual way to interact with your contracts before implementing your frontend. Follow these steps to test your contracts:

1. Visit the Remix website: Remix IDE.

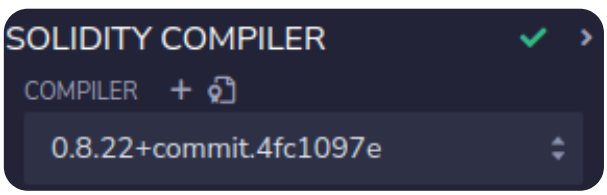


2. Upload your contracts CampaignCreator.sol and CrowdCollab.sol:
    - Navigate to the contract folder.
    - Click on one contract and press the compile green arrow.

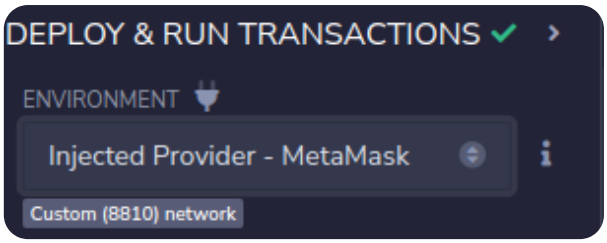




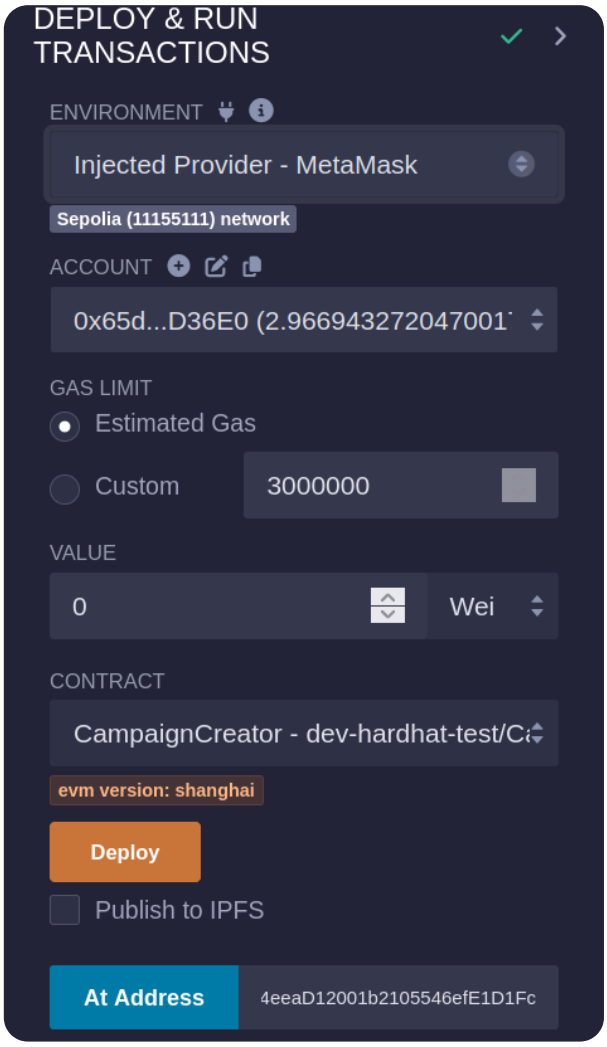
3. Ensure that the compiler version is set to 0.8.22:
    - Select the "Compiler" tab.
    - Confirm that version 0.8.22 is checked.



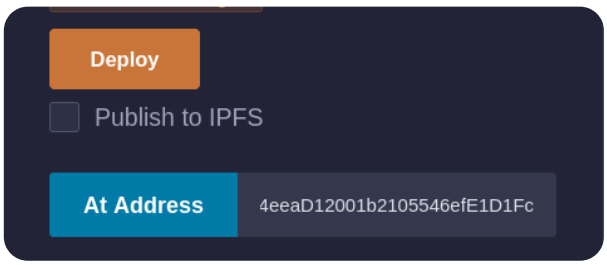
4. Go to the "Deploy" tab:
    - In the deploy tab, select "Wallet Injected Provider."
    - Connect your MetaMask account to Remix IDE.



Depending on your wallet network, poa, hardhat node or sepolia.

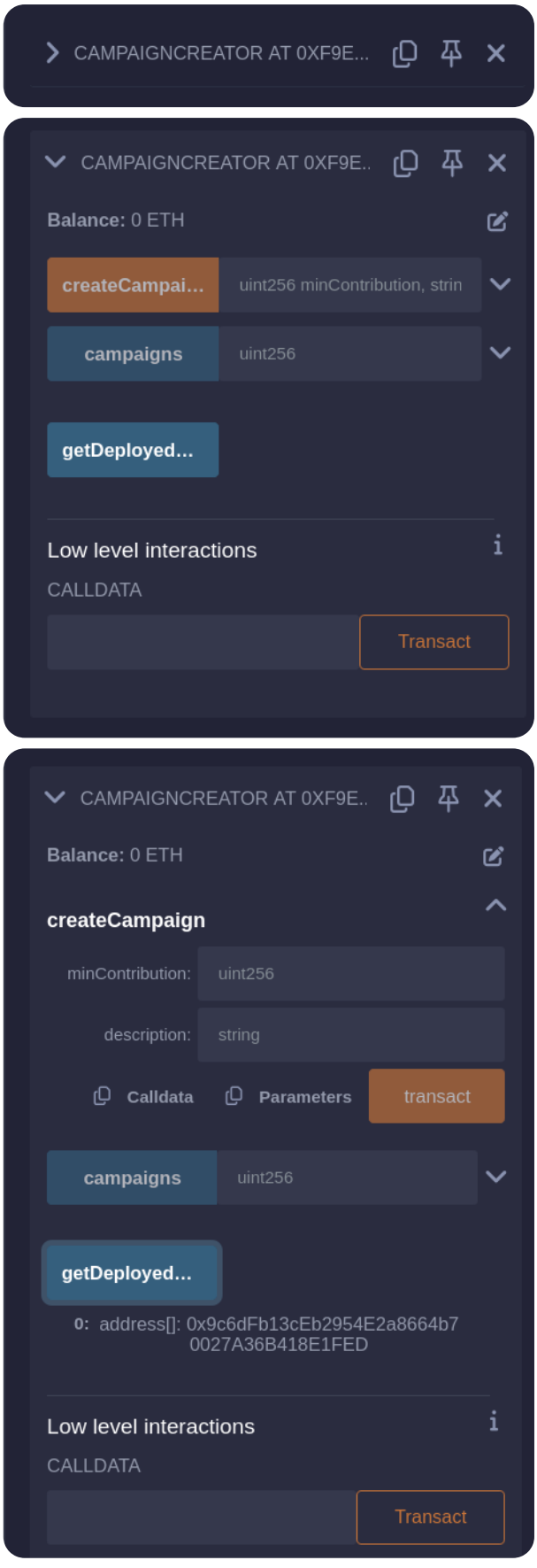


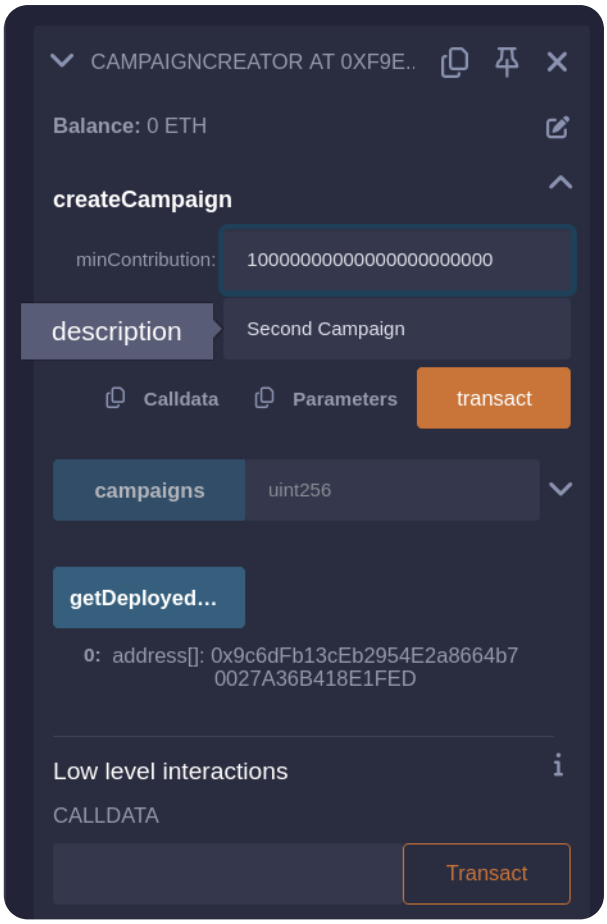
5. Paste the address of your deployed CampaignCreator.sol contract at the bottom of the deploy tab. (contract need to compiled at that point)

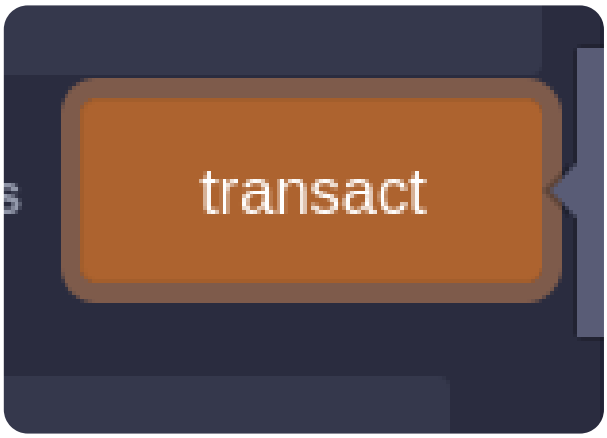


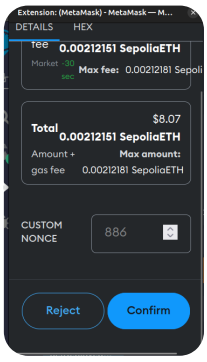
and click on "address" button

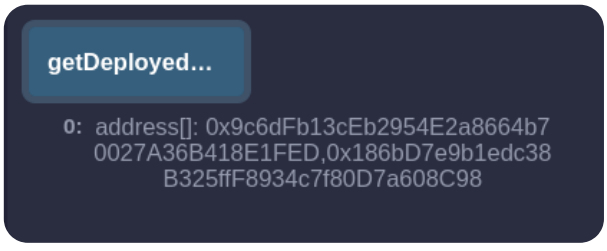
6. Load your already deployed contract:
    - This action allows you to interact with your contract in the newly appeared menu.

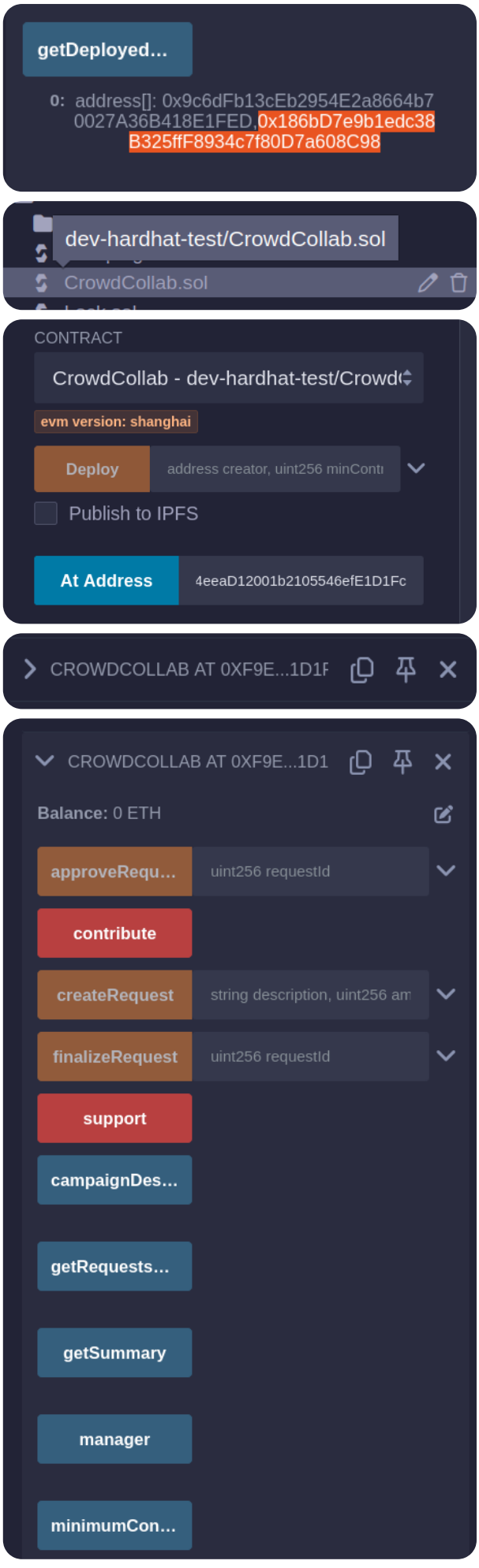

CAMPAIGNCREATOR AT 0XF9E...
CAMPAIGNCREATOR AT 0XF9E..
Balance: 0 ETH
createCampai...
uint256 minContribution, strin
campaigns
uint256
getDeployed...
Low level interactions
CALLDATA
Transact
CAMPAIGNCREATOR AT 0XF9E..
Balance: 0 ETH
createCampaign
minContribution:
uint256
description:
string
Calldata
Parameters
transact
campaigns
uint256
getDeployed...
0: address[]: 0x9c6dFb13cEb2954E2a8664b7
0027A36B418E1FED
Low level interactions
CALLDATA
Transact

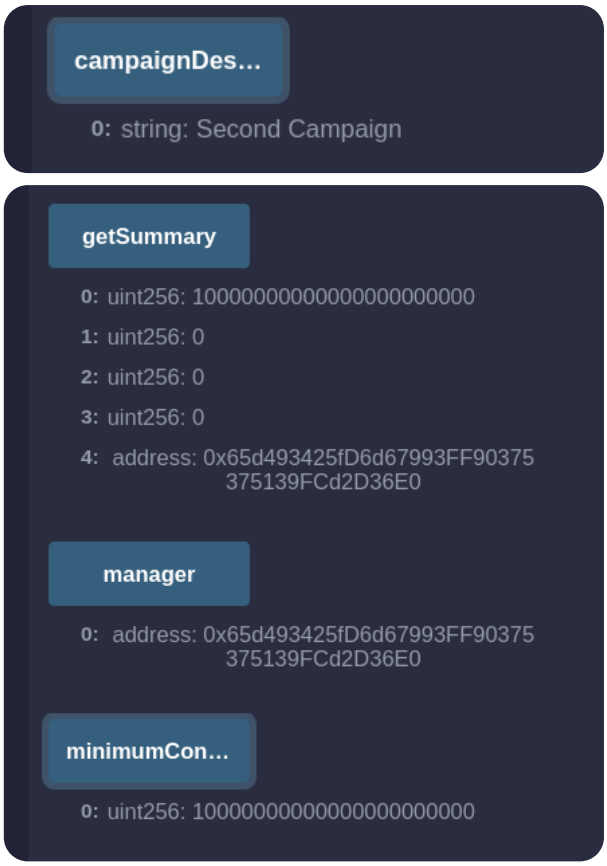

CAMPAIGNCREATOR AT 0XF9E..
Balance: 0 ETH
createCampaign
minContribution:
100000000000000000000
description
Second Campaign
Calldata
Parameters
transact
campaigns
uint256
getDeployed...
0: address[]: 0x9c6dFb13cEb2954E2a8664b7
0027A36B418E1FED
Low level interactions
CALLDATA
Transact


transact


DETAILS
HEX
0.00212151 SepoliaETH
Max fee:
$8.07
Total
0.00212151 SepoliaETH
Amount +
Max amount:
gas fee
0.00212181 SepoliaETH
CUSTOM NONCE
886
Reject
Confirm


getDeployed...
0: address[]: 0x9c6dFb13cEb2954E2a8664b7
0027A36B418E1FED,0x186bD7e9b1edc38
B325ffF8934c7f80D7a608C98


getDeployed...
0: address[]: 0x9c6dFb13cEb2954E2a8664b7
0027A36B418E1FED,0x186bD7e9b1edc38
B325ffF8934c7f80D7a608C98
dev-hardhat-test/CrowdCollab.sol
CrowdCollab.sol
CONTRACT
CrowdCollab - dev-hardhat-test/Crowd
evm version: shanghai
Deploy
address creator, uint256 minConti
Publish to IPFS
At Address
4eeaD12001b2105546efE1D1Fc
CROWDCOLLAB AT 0XF9E...1D1F
CROWDCOLLAB AT 0XF9E...1D1
Balance: 0 ETH
approveRequ...
uint256 requestId
contribute
createRequest
string description, uint256 am
finalizeRequest
uint256 requestId
support
campaignDes...
getRequests...
getSummary
manager
minimumCon...



By adhering to these guidelines, you can efficiently verify and engage with your contracts through Remix IDE before advancing to frontend development.

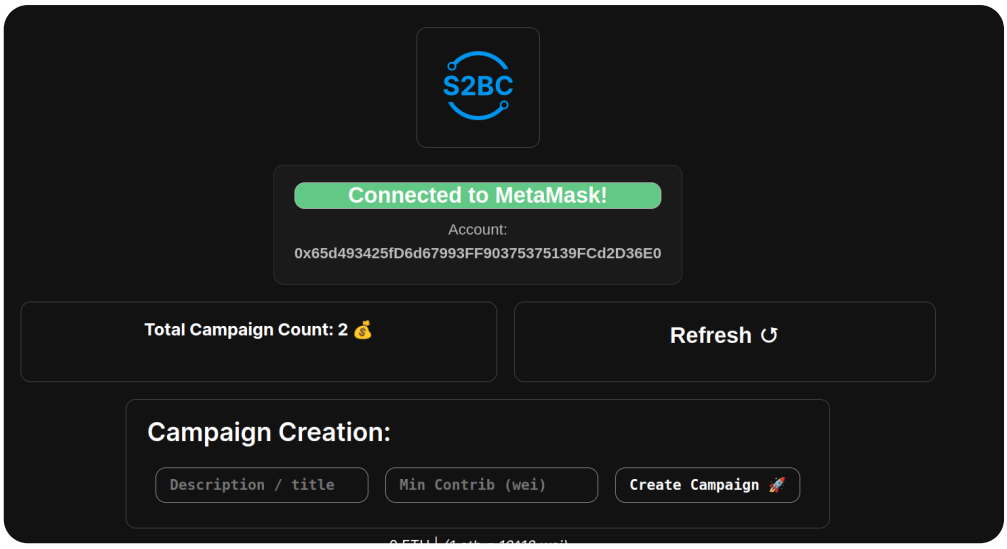
Once you've established your initial campaign, you may access the CrowdCollab instance address by repeating the earlier procedure, this time selecting the CrowdCollab contract and ensuring it's compiled before invocation.

You can test your contract like this before front-end integration.

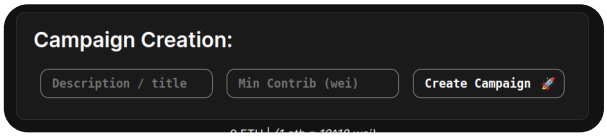
Frontend integration

UI-Screenshoots :

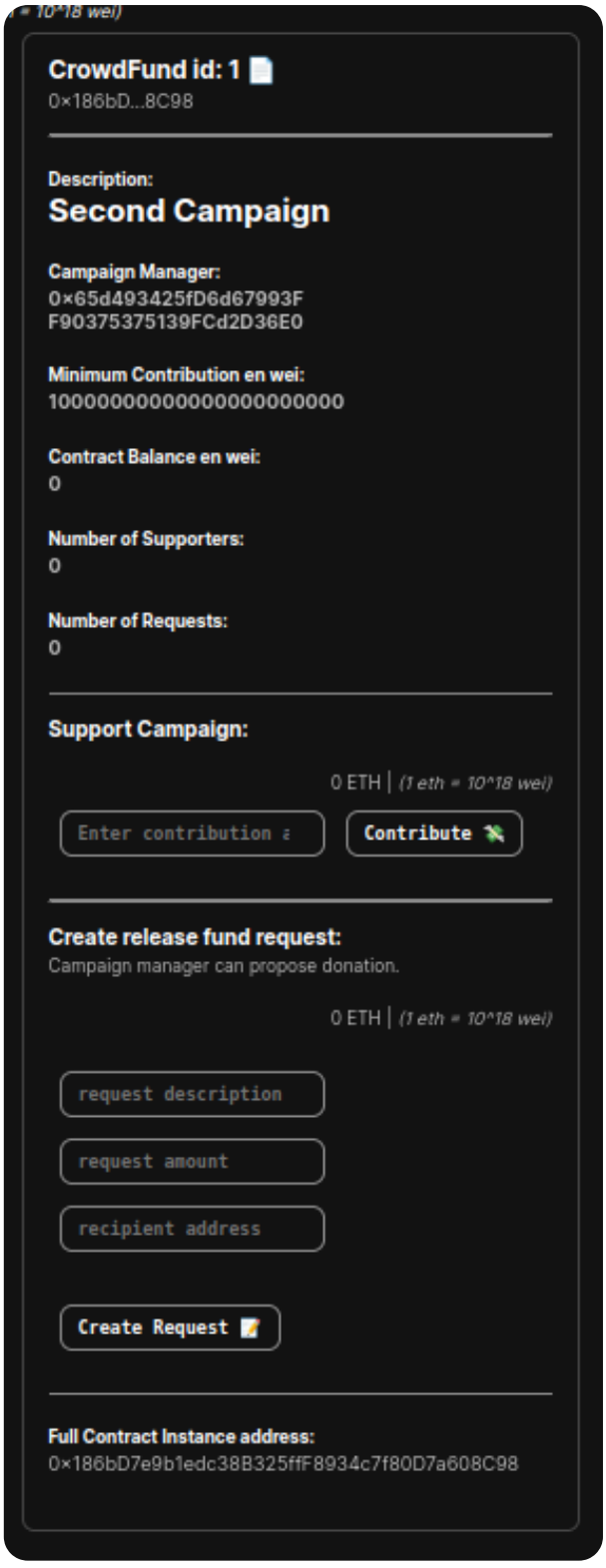
Crowdfund panel :



Create panel :



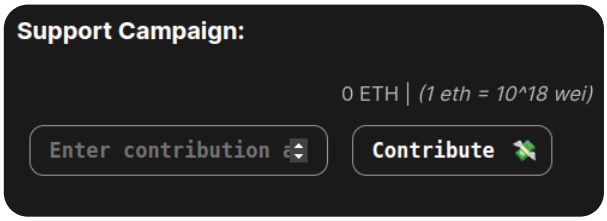
Campaign panel :



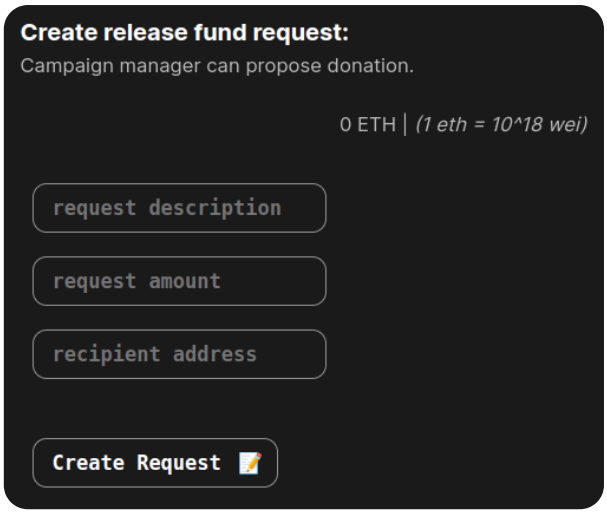
Description section:

Description section:

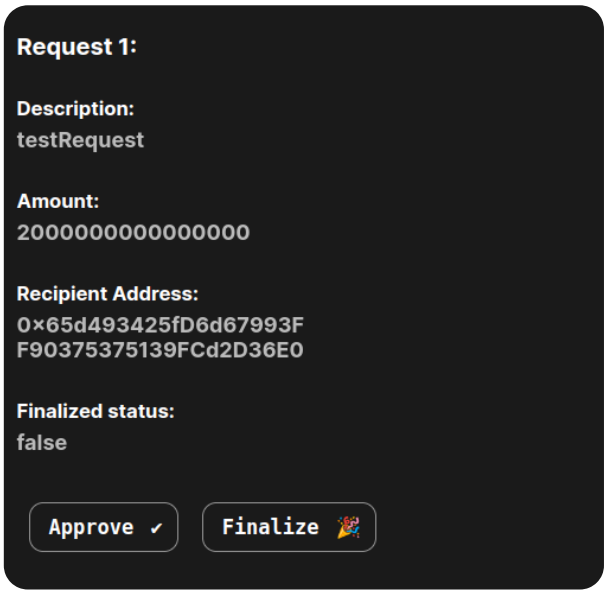
Support / Contribute section:



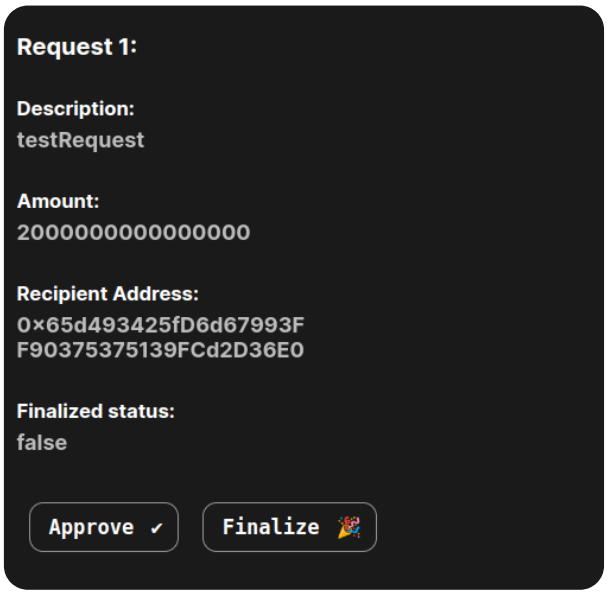
Create request:



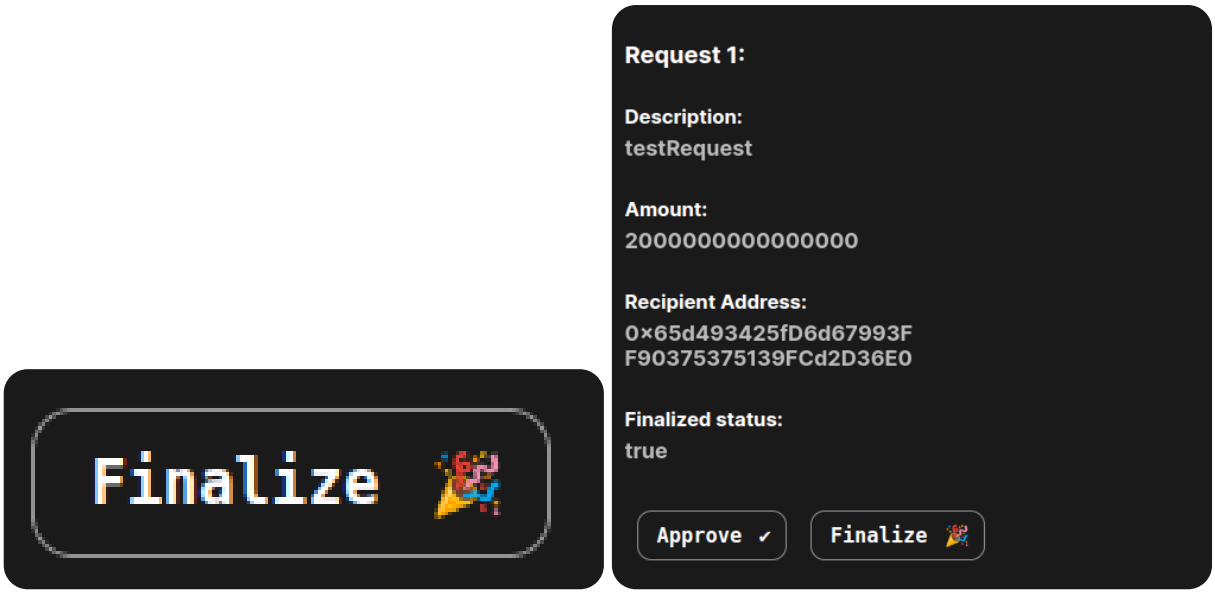
Request description:



Aproove:



Finalize:



Setting Up the Frontend

In this section, we will guide you through setting up the frontend of your Crowdfunding dApp. Follow these steps to create the necessary folders and files:

1. Create a Frontend Folder

Begin by creating a folder named `frontend` within your project directory. This folder will house all the files related to the frontend of your dApp.

Your tree folder should be like:

```
- crowdfunding-dapp-2024
   - hardhat
   - frontend
```

So if you were in hardhat folder, come back to your root folder:

```
cd ..
```

then create the frontend folder

```
mkdir frontend
cd frontend
```

2. Let's initiate Nextjs

```
npx create-next-app@latest .
```

Choose:

```
✔ Would you like to use TypeScript? … No / Yes  (NO)
✔ Would you like to use ESLint? … No / Yes  (NO)
✔ Would you like to use Tailwind CSS? … No / Yes  (NO)
✔ Would you like to use `src/` directory? … No / Yes  (YES)
✔ Would you like to use App Router? (recommended) … No / Yes  (YES)
✔ Would you like to customize the default import alias (@/*)? … No / Yes
(NO)
```

3. **Initialization and Setup dependencies**: The code begins by importing necessary dependencies like Web3, and the contract artifact. It also retrieves the contract address from the `.env.local` file.

```
npm install web3 dotenv
```

Check in your root folder package.json, it should look like this:

```
{
  "name": "front-end",
  "version": "0.1.0",
  "private": true,
  "scripts": {
    "dev": "next dev",
    "build": "next build",
    "start": "next start",
    "lint": "next lint"
  },
  "dependencies": {
    "dotenv": "^16.4.5",
    "next": "14.2.3",
    "react": "^18",
    "react-dom": "^18",
    "web3": "^4.9.0"
  }
}
```

Let's create a ".env.local" file at root of front-end folder where we will put the CampaignCreator contract address:

```
nano .env.local
```

Replace by the relevant contract address:

```
NEXT_PUBLIC_CONTRACT_ADDRESS='0xf9e783781273b94eeaD12001b2105546efE1D1Fc'
```

Then let's go to /src/app/ folder and edit page.js (our homepage)

First, just delete/clear the whole page, then add this to the top:

```
"use client";

import dotenv from "dotenv";
dotenv.config();

console.log(process.env.NEXT_PUBLIC_CONTRACT_ADDRESS);
```

Then we will import dependencies and call contract addresse variable:

```
import React, { useEffect, useState } from "react";
import Web3 from "web3"; // Import web3 library
import styles from "./page.module.css";
import Image from "next/image";
import campaignCreatorArtifact from "../../../hardhat-
deployment/artifacts/contracts/CampaignCreator.sol/CampaignCreator.json";
// Import the JSON file
import CampaignInteraction from "./CampaignInteraction";

const contractAddress = process.env.NEXT_PUBLIC_CONTRACT_ADDRESS;
```

3. **Component State**: The component defines several state variables using the `useState` hook to manage the application's state, including web3 instance, contract instance, campaign count, deployed campaigns, connection status, user address, campaign description, and minimum contribution.

```
export default function Home() {
  const [web3, setWeb3] = useState(null);
  const [contract, setContract] = useState(null);
  const [campaignCount, setCampaignCount] = useState(0);
  const [deployedCampaigns, setDeployedCampaigns] = useState([]);

  const [isConnected, setIsConnected] = useState(false);
  const [userAddress, setUserAddress] = useState("");
  const [description, setDescription] = useState("");
  const [minContribution, setMinContribution] = useState("");
```

4. **Connect to MetaMask**: The `connectMetaMask` function is used to connect to MetaMask and initialize the contract instance. It prompts the user to connect their MetaMask wallet and retrieves their account address.

```
  const connectMetaMask = async () => {
     if (window.ethereum) {
       const web3Instance = new Web3(window.ethereum);
       try {
         await window.ethereum.request({ method: "eth_requestAccounts" });
         // Initialize your contract
         const contractABI = campaignCreatorArtifact.abi; // Replace with
your contract ABI
         const contractInstance = new web3Instance.eth.Contract(
           contractABI,
           contractAddress
         );
         setWeb3(web3Instance);
         setContract(contractInstance);
         setIsConnected(true);
         const accounts = await web3Instance.eth.getAccounts();
         setUserAddress(accounts[0]);
         console.log("Connected to MetaMask!", accounts[0]);
       } catch (error) {
         console.error(
           "User denied account access or an error occurred:",
           error
         );
       }
     } else {
       console.log("MetaMask not found. Please install MetaMask to
connect.");
     }
   };


   // Add this function to handle the connection
   const handleConnectButtonClick = () => {
     connectMetaMask();
     setIsConnected(true); // Update isConnected state when connected
   };
```

5. **UseEffect Hook**: The `useEffect` hook is utilized to initialize Web3 and fetch campaign count and deployed campaigns when the component mounts.

```
   useEffect(() => {
     const initializeWeb3 = async () => {
       try {
         if (window.ethereum) {
           await connectMetaMask();
```

```
        } else {
          console.log(
            "MetaMask not found. Please install MetaMask to connect."
          );
          setIsConnected(false);
        }
      } catch (error) {
        console.error("Error initializing web3:", error);
      }
      const web3Instance = new Web3(window.ethereum);
      setWeb3(web3Instance);
      const accounts = await web3Instance.eth.getAccounts();
      setUserAddress(accounts[0]); // Assuming the first account is the
user's address
      setIsConnected(true);
      // getCampaignCount();
    };

    initializeWeb3();
  }, []);
```

6. **Interacting with the Contract**: Functions like `getCampaignCount`, `createCampaign`, and `getDeployedCampaigns` interact with the deployed contract to retrieve data and create new campaigns.

```
  const getCampaignCount = async () => {
    if (!contract) return;

    try {
      const count = await contract.methods.getDeployedCampaigns().call();
      setCampaignCount(count.length);
      console.log("count", campaignCount);
    } catch (error) {
      console.error("Error fetching campaign count:", error);
    }
  };

  useEffect(() => {
    if (contract) {
      getCampaignCount();
      getDeployedCampaigns();
    }
  }, [contract]);

  const createCampaign = async () => {
    if (!contract) return;

    // Check if connected variable is not true, then call connectMetaMask()
    if (!isConnected) {
      connectMetaMask();
      return; // Stop execution until connection is established
```

```
    }

    try {
      await contract.methods
        .createCampaign(parseInt(minContribution), description)
        .send({ from: userAddress });
      console.log("Campaign created successfully!");
    } catch (error) {
      console.error("Error creating campaign:", error);
    }
    window.location.reload();
  };

  const handleDescriptionChange = (event) => {
    setDescription(event.target.value);
  };

  const handleMinContributionChange = (event) => {
    setMinContribution(event.target.value);
  };

  // New function to interact with the contract
  const getDeployedCampaigns = async () => {
    if (!contract) return;

    try {
      // connectMetaMask();
      const deployedCampaigns = await contract.methods
        .getDeployedCampaigns()
        .call();
      console.log("Deployed Campaigns:", deployedCampaigns);
      setDeployedCampaigns(deployedCampaigns);
    } catch (error) {
      console.error("Error fetching deployed campaigns:", error);
    }
  };

  // Utility function to truncate Ethereum addresses
  const truncateAddress = (address) => {
    const start = address.substring(0, 7);
    const end = address.substring(address.length - 4, address.length);
    return `${start}...${end}`;
  };

  const handleRefreshButtonClick = () => {
    getDeployedCampaigns();
    window.location.reload(); // Reload the page after fetching deployed
campaigns
  };

    const minContributionETH = minContribution / 10 ** 18;
```

7. **UI Rendering**: The JSX code renders various UI elements like buttons, input fields, and campaign cards to display information and interact with the contract.

```
return (
    <main className={styles.main}>
      {/* Logo */}
      <div className={styles.card} onClick={() =>
window.location.reload()}>
        <Image
          src="s2bc/s2bc-logo.svg"
          width={96}
          height={96}
          alt="Logo S2BC"
          style={{ textAlign: "center", cursor: "pointer" }} // Add cursor
pointer for indicating it's clickable
        />
      </div>

      {/* MetaMask connection button */}
      <button className={styles.card} onClick={handleConnectButtonClick}>
        {!isConnected ? (
          <>
            <h2
              style={{
                background:
                  "rgba(var(--color-connect-button-not-connected), 100)",
                border: "1px solid rgba(var(--card-border-rgb), 100)",
                borderRadius: "12px",
              }}
            >
              Connect MetaMask
            </h2>
            <p>Click here to connect your MetaMask wallet</p>
          </>
        ) : (
          <>
            <h2
              style={{
                background: "rgba(var(--color-connect-button-connected),
100)",
                border: "1px solid rgba(var(--card-border-rgb), 100)",
                borderRadius: "12px",
              }}
            >
              Connected to MetaMask!
            </h2>
            <p>Account:</p>
            <p style={{ wordBreak: "break-all" }}>
              <strong>{userAddress}</strong>
            </p>
          </>
        )}
```

```
        </button>

        {/* Grid for campaign-related actions */}
        <div className={styles.grid}>
          {/* Get total campaign count */}
          <div className={styles.card} onClick={getCampaignCount}>
            <h4 style={{ textAlign: "center" }}>
              Total Campaign Count: <strong>{campaignCount}</strong>{" "}
              <span>&#x1F4B0;</span>
            </h4>
          </div>

          {/* Button to refresh deployed campaigns */}
          <button className={styles.card} onClick={handleRefreshButtonClick}>
            <h2>
              Refresh <span>&#x21BA;</span>
            </h2>
          </button>
        </div>

        {/* Form to create a new campaign */}
        <div className={styles.card}>
          <h2>Campaign Creation:</h2>
          <input
            type="text"
            placeholder="Description / title"
            value={description}
            onChange={handleDescriptionChange}
          />
          <input
            type="number"
            placeholder="Min Contrib (wei)"
            value={minContribution}
            onChange={handleMinContributionChange}
          />
          <button onClick={createCampaign}>
            Create Campaign <span>&#x1F680;</span>
          </button>
        </div>

        <p style={{ textAlign: "center", fontSize: "smaller" }}>
          {minContributionETH} ETH | <em>(1 eth = 10^18 wei)</em>
        </p>

        {/* Display deployed campaigns */}
        <div className={styles.grid}>
          {deployedCampaigns.map((campaign, index) => (
            <div className={styles.card} key={index}>
              <h3>
                CrowdFund id: {index + 0} <span>&#x1F4C4;</span>
              </h3>
              <p>{truncateAddress(campaign)}</p>

              <hr />
```

```
            {/* Interact with campaign */}
            <CampaignInteraction
              contractAddress={campaign}
              web3={web3}
            />
            <hr />
            <div>
              <h5>Full Contract Instance address:</h5>
              <p style={{ wordBreak: "break-all" }}>{campaign}</p>
            </div>
          </div>
        ))}
      </div>
    </main>
  );
}
```

Integrating Campaign Interaction Component

To enhance the functionality of your Crowdfunding dApp frontend, it's essential to integrate the `CampaignInteraction` component. This component facilitates interaction with individual campaigns deployed on the Ethereum blockchain. Here's how you can include it in your application:

1. **Import the Component**: Make sure to import the `CampaignInteraction` component into your main page or any other relevant component where you intend to display campaign details and allow user interaction.

   ```
   import CampaignInteraction from "./CampaignInteraction";
   ```

2. **Render the Component**: It passing necessary props such as `contractAddress`, `web3`, `isConnected`, and `userAddress` to the component.

   ```
   <CampaignInteraction contractAddress={campaignAddress} web3=
   {web3Instance} />
   ```

3. **Utilize Component Features**: Once integrated, the `CampaignInteraction` component enables users to contribute to campaigns, create release fund requests, approve requests, and finalize requests, thereby enhancing the usability and functionality of your Crowdfunding dApp.

By integrating the `CampaignInteraction` component, you provide users with a seamless experience to interact with individual campaigns, contributing to the overall success and effectiveness of your Crowdfunding dApp frontend.

CampaignInteraction.js coponent:

```
"use client";

import React, { useEffect, useState } from "react";
import Web3 from "web3";
import crowdCollabArtifact from "../../../hardhat-
deployment/artifacts/contracts/CrowdCollab.sol/CrowdCollab.json";
import styles from "./page.module.css";

const contractAbi = crowdCollabArtifact.abi;

const CampaignInteraction = ({ contractAddress, web3 }) => {
  const [contractInstance, setContractInstance] = useState(null);
  const [campaignDescription, setCampaignDescription] = useState("");
  const [manager, setManager] = useState("");
  const [minimumContribution, setMinimumContribution] = useState(0);
  const [minimumContributionShow, setMinimumContributionShow] =
useState(0);

  const [numberSupporters, setNumberSupporters] = useState(0);
  const [requests, setRequests] = useState([]);
  const [contributionAmount, setContributionAmount] = useState("");
  const [isConnected, setIsConnected] = useState(false);
  const [userAddress, setUserAddress] = useState("");

  const [requestDescription, setRequestDescription] = useState("");
  const [requestAmount, setRequestAmount] = useState("");
  const [requestRecipient, setRequestRecipient] = useState("");

  const [approvalCounts, setApprovalCounts] = useState([]);
  const [contractBalance, setContractBalance] = useState([]);

  useEffect(() => {
    //const web3 = new Web3("https://votingchain-29886.morpheuslabs.io");
    const instance = new web3.eth.Contract(contractAbi, contractAddress);
    setContractInstance(instance);
  }, [contractAddress]);

  useEffect(() => {
    const getSummary = async () => {
      try {
        if (contractInstance) {
          const description = await contractInstance.methods
            .campaignDescription()
            .call();
          const managerAddress = await contractInstance.methods
            .manager()
            .call();
          const minimumContribution = await contractInstance.methods
            .minimumContribution()
            .call();
          const minimumContributionShow = minimumContribution.toString();
```

```
          const numSupporters = await contractInstance.methods
            .numberSupporters()
            .call();

          setCampaignDescription(description);
          setManager(managerAddress);
          setMinimumContribution(minimumContribution);
          setNumberSupporters(numSupporters);

          // Fetch requests
          const requestsCount = await contractInstance.methods
            .getRequestsCount()
            .call();
          const requestsArray = [];
          for (let i = 0; i < requestsCount; i++) {
            const request = await
contractInstance.methods.requests(i).call();
            requestsArray.push(request);
          }
          setRequests(requestsArray);

          // Fetch contract balance
          const contractBalance = await web3.eth.getBalance(
            contractInstance.options.address
          );
          setContractBalance(contractBalance);
        }
      } catch (error) {
        console.error("Error getting contract summary:", error);
      }
    };

    getSummary();
  }, [contractInstance]);

  const handleContribution = async () => {
    try {
      if (!window.ethereum) {
        console.error("MetaMask extension not detected");
        return;
      }

      // Request account access if needed
      await window.ethereum.request({ method: "eth_requestAccounts" });

      const web3Instance = new Web3(window.ethereum);
      const accounts = await web3Instance.eth.getAccounts();
      const senderAddress = accounts[0];

      // Initialize contract instance
      const contractInstance = new web3Instance.eth.Contract(
        contractAbi,
        contractAddress
      );
```

```
    // Perform the contribution
    await contractInstance.methods.contribute().send({
      value: contributionAmount,
      from: senderAddress,
    });

    // Refresh campaign summary after contribution
    // getSummary();
  } catch (error) {
    console.error("Error contributing to campaign:", error);
  }
  window.location.reload();
};

const createRequest = async () => {
  try {
    if (!window.ethereum) {
      console.error("MetaMask extension not detected");
      return;
    }

    await window.ethereum.request({ method: "eth_requestAccounts" });

    const web3Instance = new Web3(window.ethereum);
    const accounts = await web3Instance.eth.getAccounts();
    const senderAddress = accounts[0];

    const contractInstance = new web3Instance.eth.Contract(
      contractAbi,
      contractAddress
    );

    await contractInstance.methods
      .createRequest(requestDescription, requestAmount, requestRecipient)
      .send({ from: senderAddress });
  } catch (error) {
    console.error("Error creating request:", error);
  }
  window.location.reload();
};

const approveRequest = async (requestId) => {
  try {
    await window.ethereum.request({ method: "eth_requestAccounts" });
    const web3Instance = new Web3(window.ethereum);
    const accounts = await web3Instance.eth.getAccounts();
    const senderAddress = accounts[0];

    const contractInstance = new web3Instance.eth.Contract(
      contractAbi,
      contractAddress
    );
```

```
      await contractInstance.methods.approveRequest(requestId).send({
        from: senderAddress,
      });
    } catch (error) {
      console.error("Error approving request:", error);
    }
    window.location.reload();
  };

  const finalizeRequest = async (requestId) => {
    try {
      await window.ethereum.request({ method: "eth_requestAccounts" });
      const web3Instance = new Web3(window.ethereum);
      const accounts = await web3Instance.eth.getAccounts();
      const senderAddress = accounts[0];

      const contractInstance = new web3Instance.eth.Contract(
        contractAbi,
        contractAddress
      );

      await contractInstance.methods.finalizeRequest(requestId).send({
        from: senderAddress,
      });
    } catch (error) {
      console.error("Error finalizing request:", error);
    }
    window.location.reload();
  };

  const contributionAmountETH = contributionAmount / 10 ** 18;
  const requestAmountETH = requestAmount / 10 ** 18;

  return (
    <div>
      <div>
        <h5>Description:</h5>
        <h2>
          <strong>{campaignDescription}</strong>
        </h2>
      </div>
      <div>
        <h5>Campaign Manager:</h5>
        <p style={{ wordBreak: "break-all" }}>
          <strong>{manager}</strong>
        </p>
      </div>
      <div>
        <h5>Minimum Contribution en wei:</h5>
        <p style={{ wordBreak: "break-all" }}>
          <strong>{minimumContribution.toString()}</strong>
        </p>
      </div>
      <div>
```

```
          <h5>Contract Balance en wei:</h5>
          <p style={{ wordBreak: "break-all" }}>
            <strong>{contractBalance.toString()}</strong>
          </p>
        </div>
        <div>
          <h5>Number of Supporters:</h5>
          <p>
            <strong>{numberSupporters.toString()}</strong>
          </p>
        </div>
        <div>
          <h5>Number of Requests:</h5>
          <p>
            <strong>{requests.length}</strong>
          </p>
        </div>
        {/* Render request descriptions */}
        {requests.map((request, index) => (
          <div key={index}>
            <hr />
            <div>
              {/* Request details */}
              <h4>Request {index + 1}:</h4>
            </div>
            <div>
              <h5>Description:</h5>
              <p>
                <strong>{request.description}</strong>
              </p>
            </div>
            <div>
              <h5>Amount:</h5>
              <p>
                <strong>{request.amount.toString()}</strong>
              </p>
            </div>
            <div>
              <h5>Recipient Address:</h5>
              <p>
                <strong>{request.recipient}</strong>
              </p>
            </div>
            <div>
              <h5>Finalized status:</h5>
              <p>
                <strong>{request.complete.toString()}</strong>
              </p>
            </div>

            {/* Button to approve request */}
            <button onClick={() => approveRequest(index)}>
              Approve <span>&#x2714;</span>
            </button>
```

```
            {/* Button to finalize request */}
            <button onClick={() => finalizeRequest(index)}>
              Finalize <span>&#x1F389;</span>
            </button>
            {/* Note about request finalization */}
            <div>
              <em style={{ fontSize: "smaller", wordBreak: "keep-all" }}>
                To finalize a request, the number of approvals must exceed
half of
                the total supporters.
              </em>
            </div>
          </div>
        ))}

        {/* Input field for contribution amount */}
        <hr />
        <h4>Support Campaign:</h4>
        <div>
          <p style={{ textAlign: "right", fontSize: "smaller" }}>
            {contributionAmountETH} ETH | <em>(1 eth = 10^18 wei)</em>
          </p>
          <input
            type="number"
            value={contributionAmount}
            onChange={(e) => setContributionAmount(e.target.value)}
            placeholder="Enter contribution amount"
          />
          {/* Button to trigger contribution */}
          <button onClick={handleContribution}>
            Contribute <span>&#x1F4B8;</span>
          </button>
        </div>

        {/* Create release fund request section */}

        <hr />

        <h4>Create release fund request:</h4>
        <p style={{ fontSize: "smaller" }}>
          Campaign manager can propose donation.
        </p>
        <div>
          <p style={{ textAlign: "right", fontSize: "smaller" }}>
            {requestAmountETH} ETH | <em>(1 eth = 10^18 wei)</em>
          </p>
        </div>
        <div>
          <input
            type="text"
            value={requestDescription}
            onChange={(e) => setRequestDescription(e.target.value)}
            placeholder="request description"
          />
```

```
          <input
            type="number"
            value={requestAmount}
            onChange={(e) => setRequestAmount(e.target.value)}
            placeholder="request amount"
          />

          <input
            type="text"
            value={requestRecipient}
            onChange={(e) => setRequestRecipient(e.target.value)}
            placeholder="recipient address"
          />
        </div>

        {/* Button to create request */}
        <button onClick={createRequest}>
          Create Request <span>&#x1F4DD;</span>
        </button>
      </div>
    );
};

export default CampaignInteraction;
```

Launch the dapp: `npm run dev`

It should start your app at port :3000, with morpheus you have the node:3000 address that you can find on your dashboard:

node:3000 address: