Homework: Home Repair Service

The Home Repair Service is a blockchain-based system that manages requests for home repairs and payments for those repairs. The system is designed to simplify the process of requesting and paying for repairs, while also ensuring that the repair work is properly audited and approved before payment is made.

The Home Repair Service is run by an administrator who receives repair requests and accepts them. Once a request is accepted, it must be executed by the repair team. Then auditors review the repair work to ensure it is completed properly. If the repair work is approved by the auditors, payment is made to the repairer. Otherwise, the payment is returned to the client.

Functionality

The Home Repair Service contract should allow users to perform the following actions:

1. Add a repair request

Users should be able to add a repair request to the system by providing a request ID and a brief description of the repair work.

Example:

User A wants to repair their roof and submits a repair request to the Home Repair Service contract. The request ID is 1 and the description is "Fix roof leak"

2. Accept a repair request

The system administrator should be able to accept a repair request by providing the request ID.

Example:

The system administrator reviews the repair request from User A and accepts it (says that the repair team can handle the request) by providing the request ID and tax in ETH.

3. Add a payment

Users should be able to add a payment to the system for a repair request that has been accepted.

Example:

The user adds payment to the Home Repair Service contract by providing the request ID and the amount given by the admin in the previous step. Then the request must be handled by the repairer.

4. Confirm a repair request

After the job is done by the repairer, the system administrator should be able to confirm that a repair request has been completed by providing the request ID.

Example:

The repairer completes the roof repair work and notifies the system administrator. The system administrator confirms the repair by providing the request ID.

Follow us:

5. Verify that the job is done

Auditors should be able to verify that the job is done by providing the requested ID.

Example:

The auditor reviews the repair and is done well by providing the requested ID. (More than one auditor -> better decentralization.)

6. Execute a repair request

The system should execute a repair request by transferring payment to the repairer if the repair work has been approved by at least two auditors.

Example:

The auditor approves the payment, and the Home Repair Service contract executes the request by transferring payment to the repairer.

7. Money-back

The user should execute a money-back request that transfers the payment back to him in case the job is not verified for more than 1 month.

8. Tips for Implementation

Here are some tips for implementing the Home Repair Service contract:

- Use mappings to store requests, payments, and confirmation status.
- Use reverts and errors to restrict access to certain functions.
- Use require/custom error statements to validate inputs and prevent errors.