Assignment -2 : Supply Chain Based E-Commerce System

Deadline : 6th june 11:59 pm (Tuesday).

Github Submission Guidelines:
https://github.com/pclubiitk/Lord-of-Chains-25.git

1) Fork this repository on Github.
2) Clone your fork to your local machine.
3) Work on your assignment in that particular assignment's folder (if it's the first assignment, work in Assignment-1 directory), **create a folder inside the assignments folder** (Naming convention: <your name>-<your roll no.>-<assignment number> Ex: Srijani-231033-1) and commit all changes with clear messages.
4) Push your changes to your fork.
5) Create a pull request from your fork's branch to the original repo.

Objective: Design and implement a smart contract that tracks the journey of a product in a supply chain while logging status updates and timestamps at each step. This system must have multiple roles which interact through role-based functions. The goal is to provide verifiable on-chain tracking and time-based delivery auditing **without involving any monetary transaction**

Each product is assigned an expected delivery time, and your contract must track whether the delivery was completed within that time window. The final product should provide full tracking transparency for all supply chain actors and verifiable logs on-chain using Solidity events and data structures.

Features to Implement:

- Implement available IDs of products and buyer requests for some items.
- Seller generates a package based on requests from buyer , with the buyer expected time for delivery.

- Assign roles warehouse,delivery boy,buyer and seller, assume there exist only one of their kind in this system.
- Implement a on chain ledger with appropriate data structures consisting of from and to parts of transfer with time stamp of transfer between them.
- Implement a product specific view transaction history function view function.
- Implement modifiers and events to implement a transfer with a variable representing its current position.
- Use **block.timestamp** for on chain track of real time

This is a basic outline of things to be implemented. Feel free to add new ideas based on your interpretation.

block.timestamp :

- **`block.timestamp`** is a **global variable** in Solidity that returns the **timestamp (in seconds) of the current block**. It represents the time when the block was mined, set by the miner. Try to keep the deadline large enough(~30 min-1hr) so that approximation in block.timestamp doesn't affect the execution of the system. It returns the number of seconds from 1 jan 1970 UTC.use uint256 which is basically an un signed integer of 256 length for storing it.

Use the below contract to understand for how block.stamp work

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.19;

contract SimpleTimeExample {
    uint256 public deadline;

    // Set deadline
    function setDeadline() public {
        deadline = block.timestamp + 3600;  // 3600 seconds = 1 hour
    }

    function deadline_check() public view returns (bool) {
        return block.timestamp > deadline;
    }

    //Get current block timestamp
    function get_time_stamp() public view returns (uint256) {
        return block.timestamp;
    }
}
```