Intelligent Stability System for Passenger Seats in Vessels

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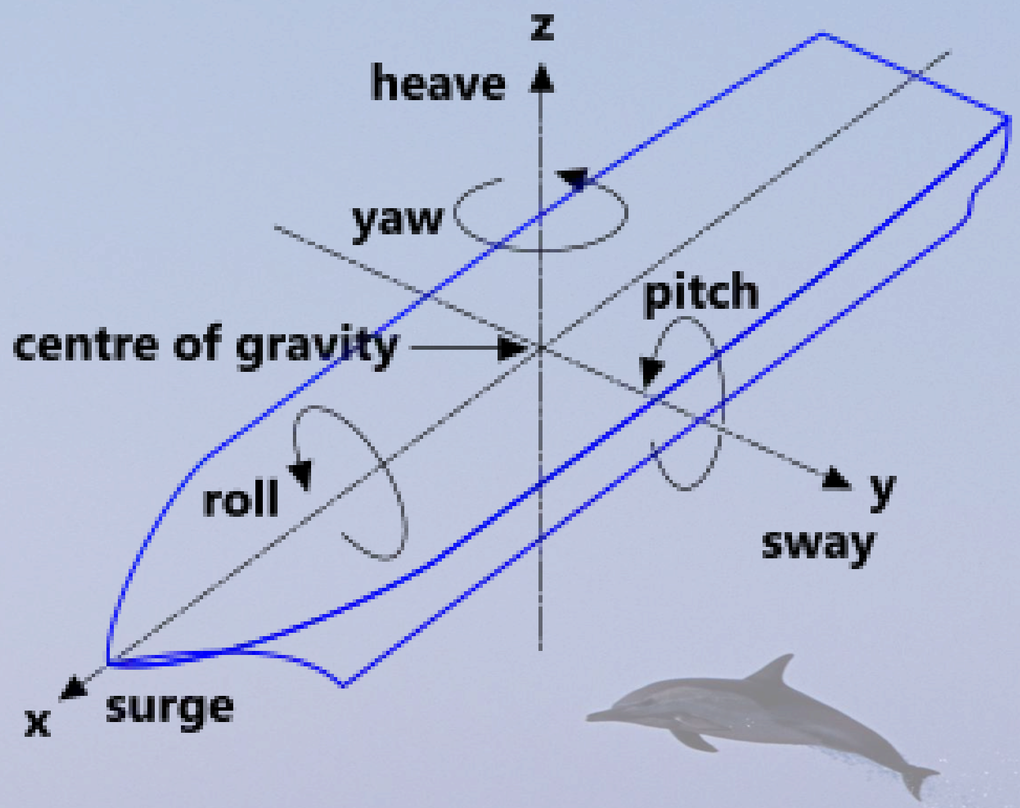
The negative effects of vessel motions for passengers



The motions in the ships such as rolling, pitching and yawing are known for the bad effects and discomfort on passengers. They create difficulty to move, sleep, couse seasickness and even injuries.

These unpleasant motions are the main reason that many people refuse to travel by sea

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The second main issue at sea is the unfavourable weather conditions such as temperature and high humidity

Usually the high humidity and temperature is observed at sea throughout the whole voyage which is the main reason of physical discomfort and reduced well-being on passengers as well as on crew

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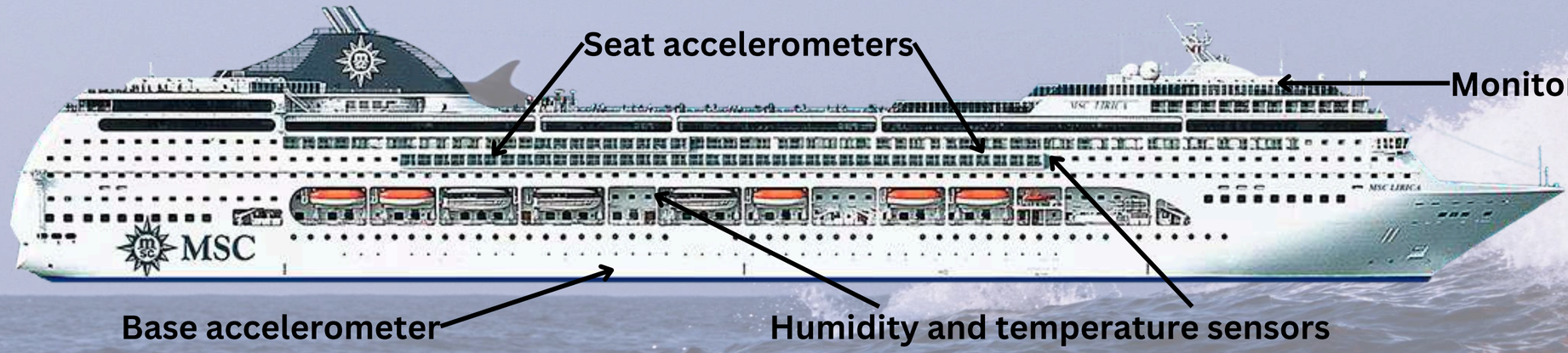
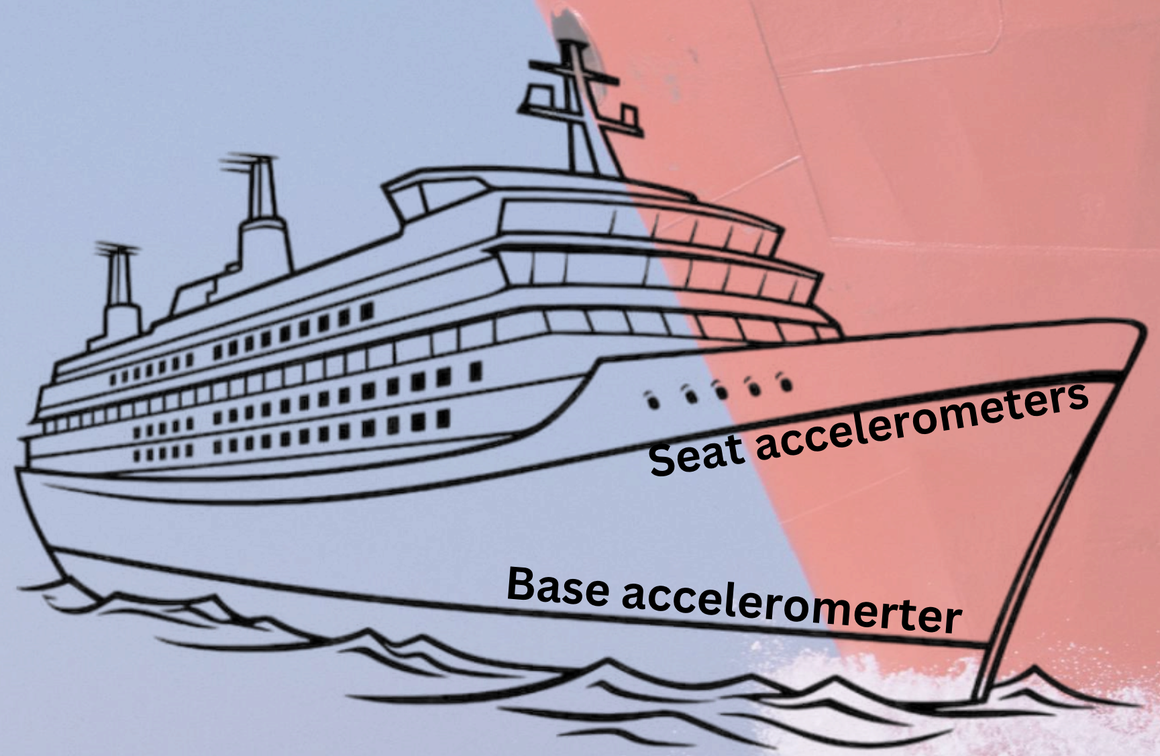
The main purpose of our system

Our system aims at preventing or reducing negative effects of these phenomenons by helping passengers to monitor and minimize these excessive values with the help of sensors and actuators



Acceptable values

The difference between base and seat accelerometer detects how much ship is rolling or pitching. By determining threshold value the crew can monitor and prevent motions which exceed the acceptable value. We determined range between 1.5G and 3G as acceptable acceleration. Values beyond that is considered unacceptable and should be prevented. In our arduino system this values are indicated by both buzzer and RGB led.



RGB light color and buzzer warning according to acceleration:

a<1.5G 1.5G-3G a>3G

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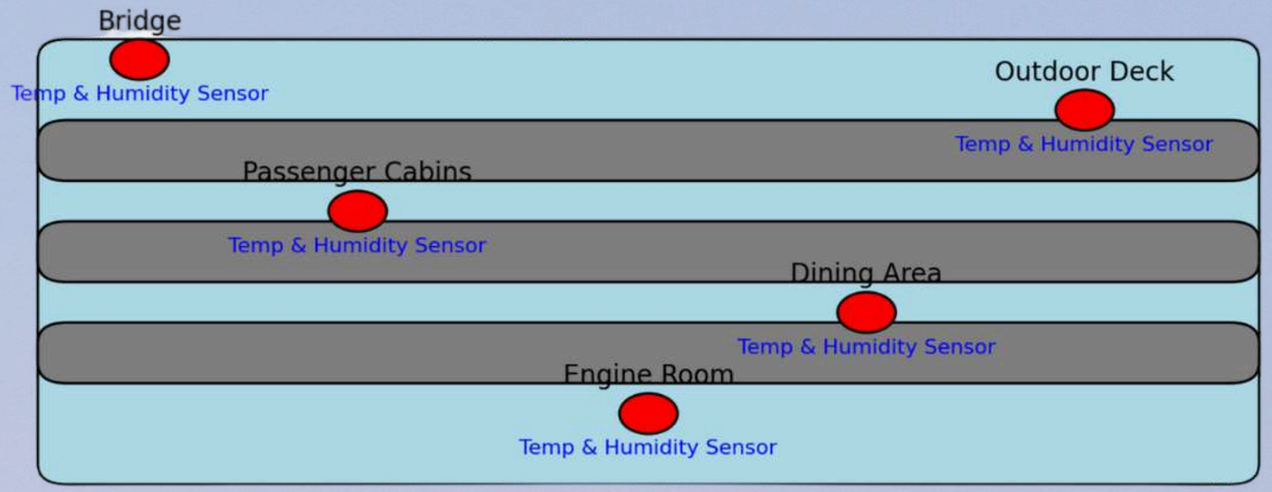
Temperature and Humidity



Temperature and humidity are other factors needed to be controlled in passenger ships. Our system also focuses on the favourable temperature and humidity values in all cabins of the passenger ship to provide the highest comfort.

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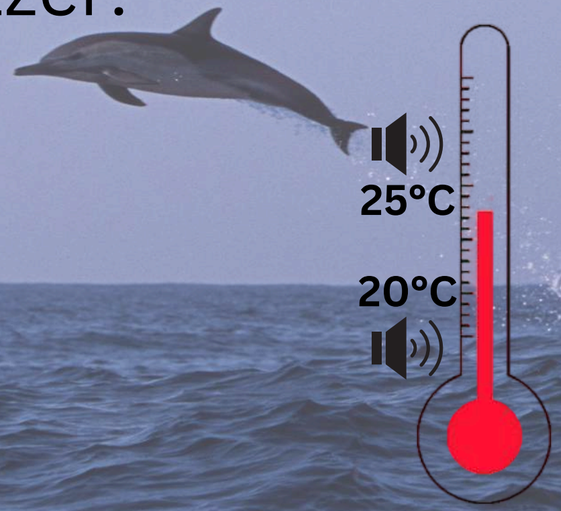
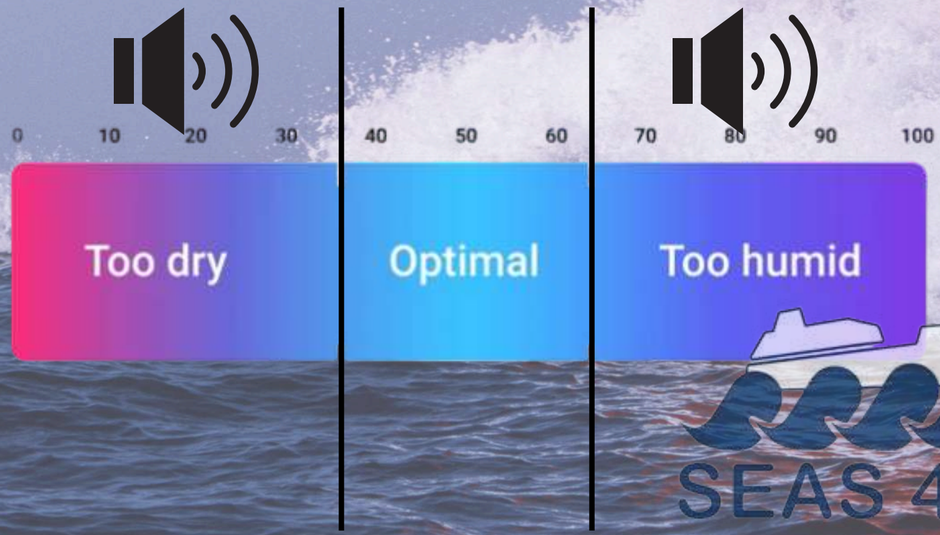
For humidity sensor we determined the range between 40% and 60% relative humidity and for temperature sensor range between 20°C and 25°C as comfortable condition for all passengers.

In our system values beyond that are warned by buzzer:





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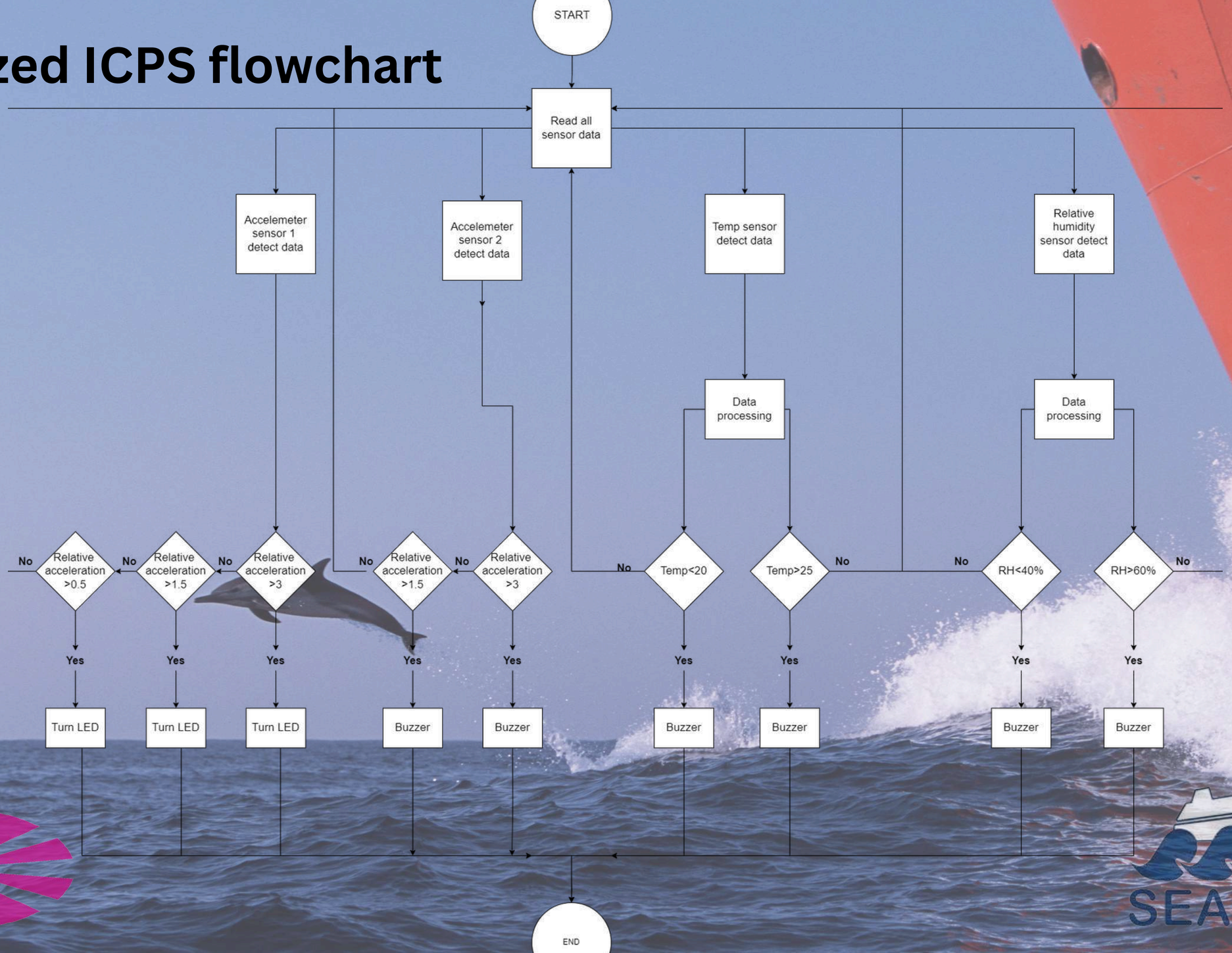
Finalized ICPS flowchart



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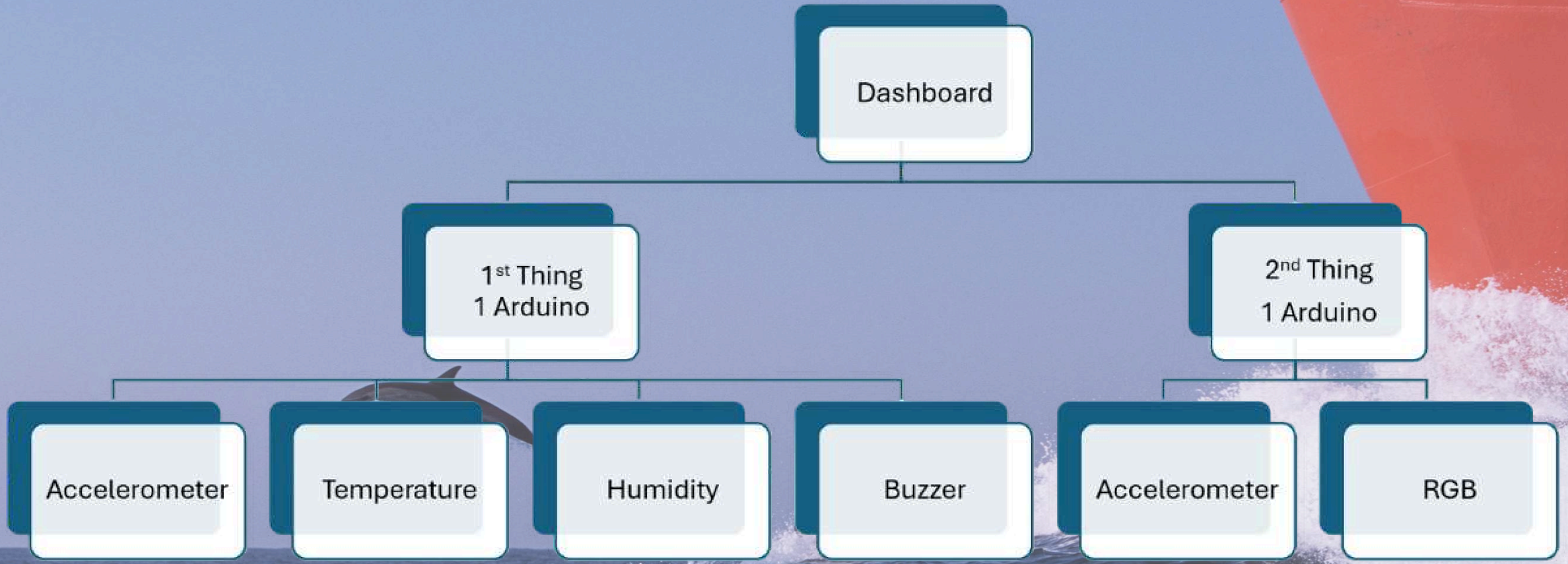
Complete overview of our Ardunio system



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Arduino Cloud Dashboard

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Blockchain smart contract

In this system we will provide an experience similar to in flight entertainment systems found on airplanes, where passengers can control various aspects of their immediate environment. Functions of this system are

Passenger Comfort and Environment:

Login with Name and Travel ID
Adjust Temperature, Humidity

Motion Damping Feature Activation:

Passengers have option to activate the damped seat feature using tokens allocated

Owner Management Control:

Create or delete a customer login credentials
Manage Temperature, Humidity, Activate Damping
Perform all the functions without needing tokens

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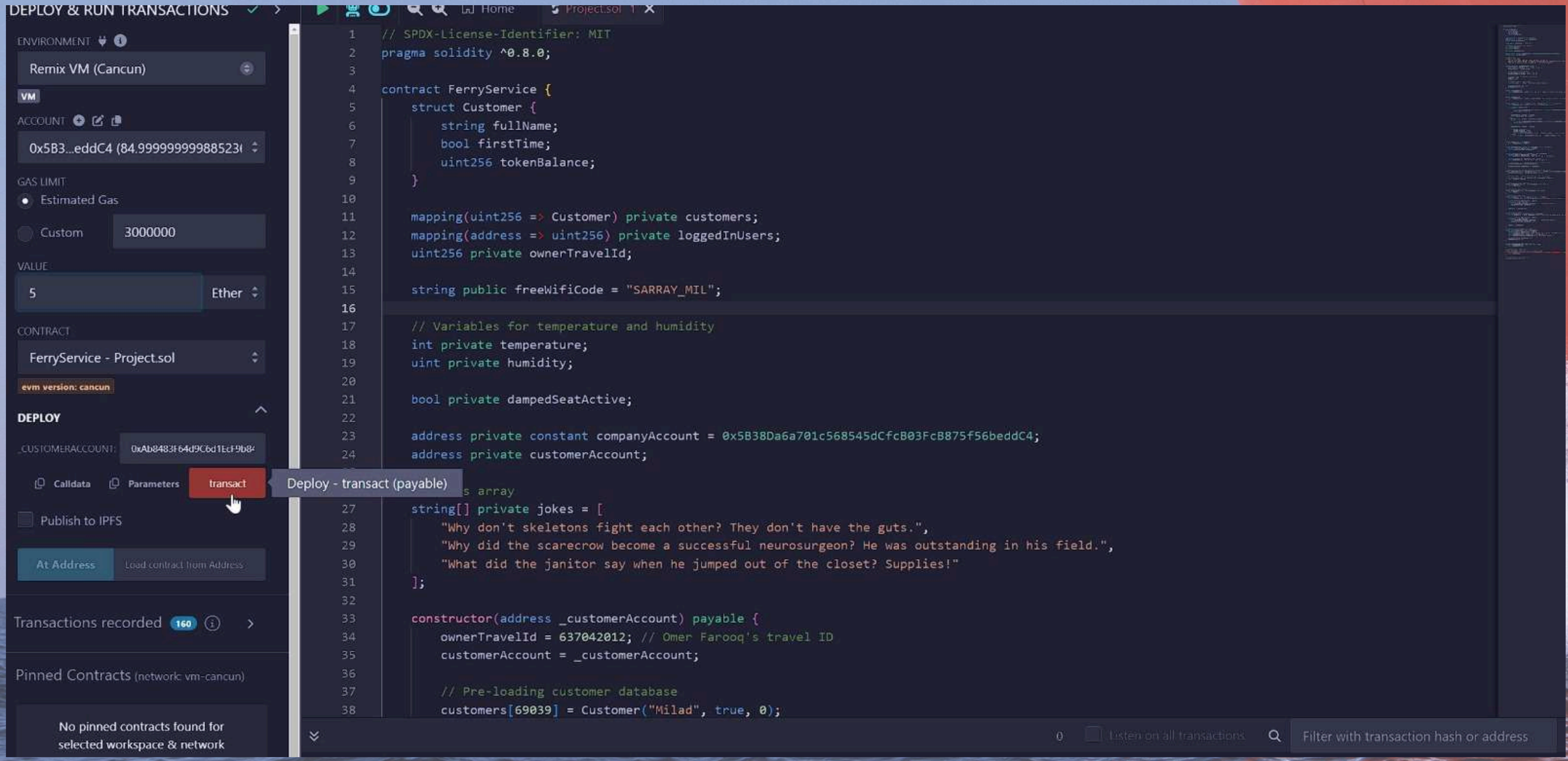
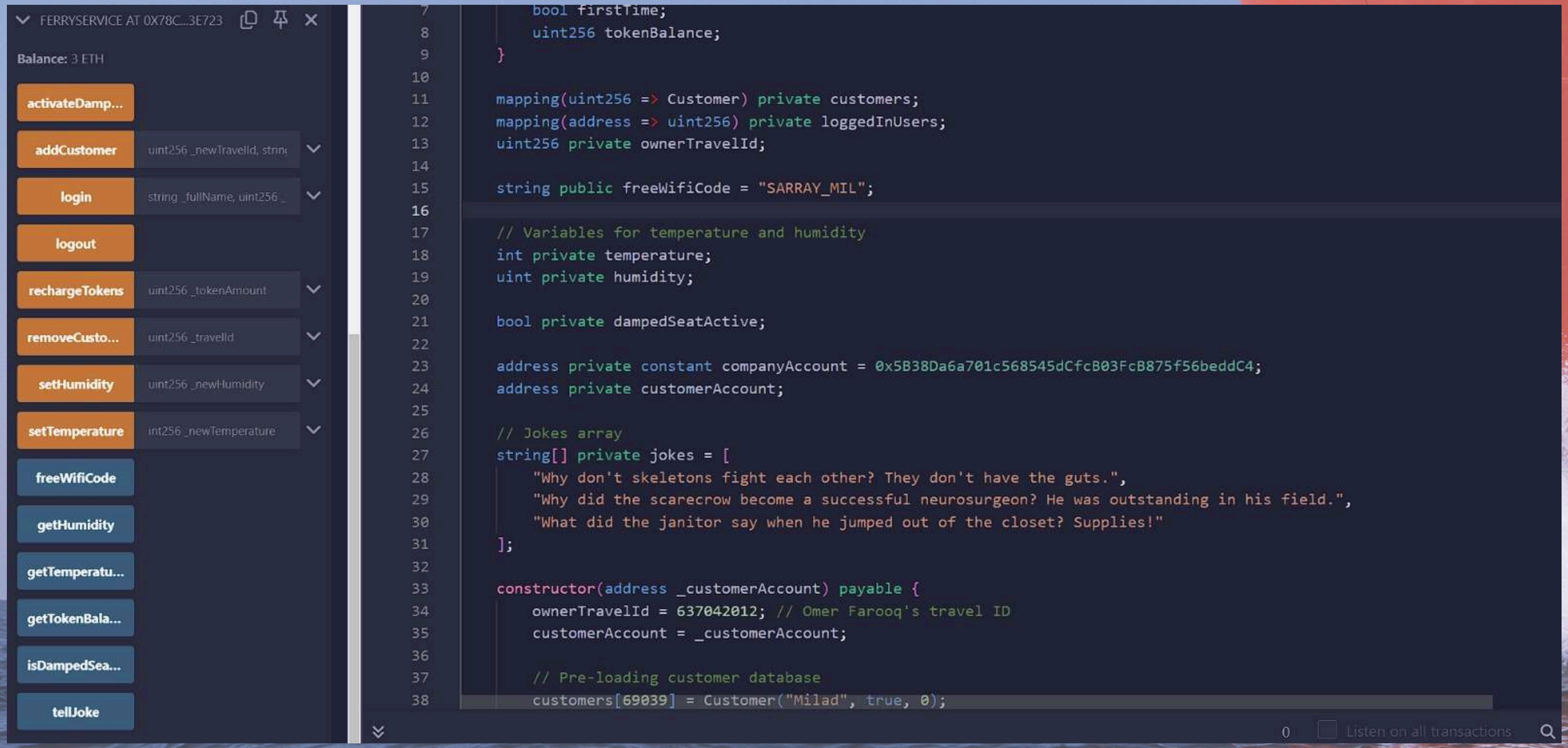
Blockchain smart contract



Blockchain smart contract



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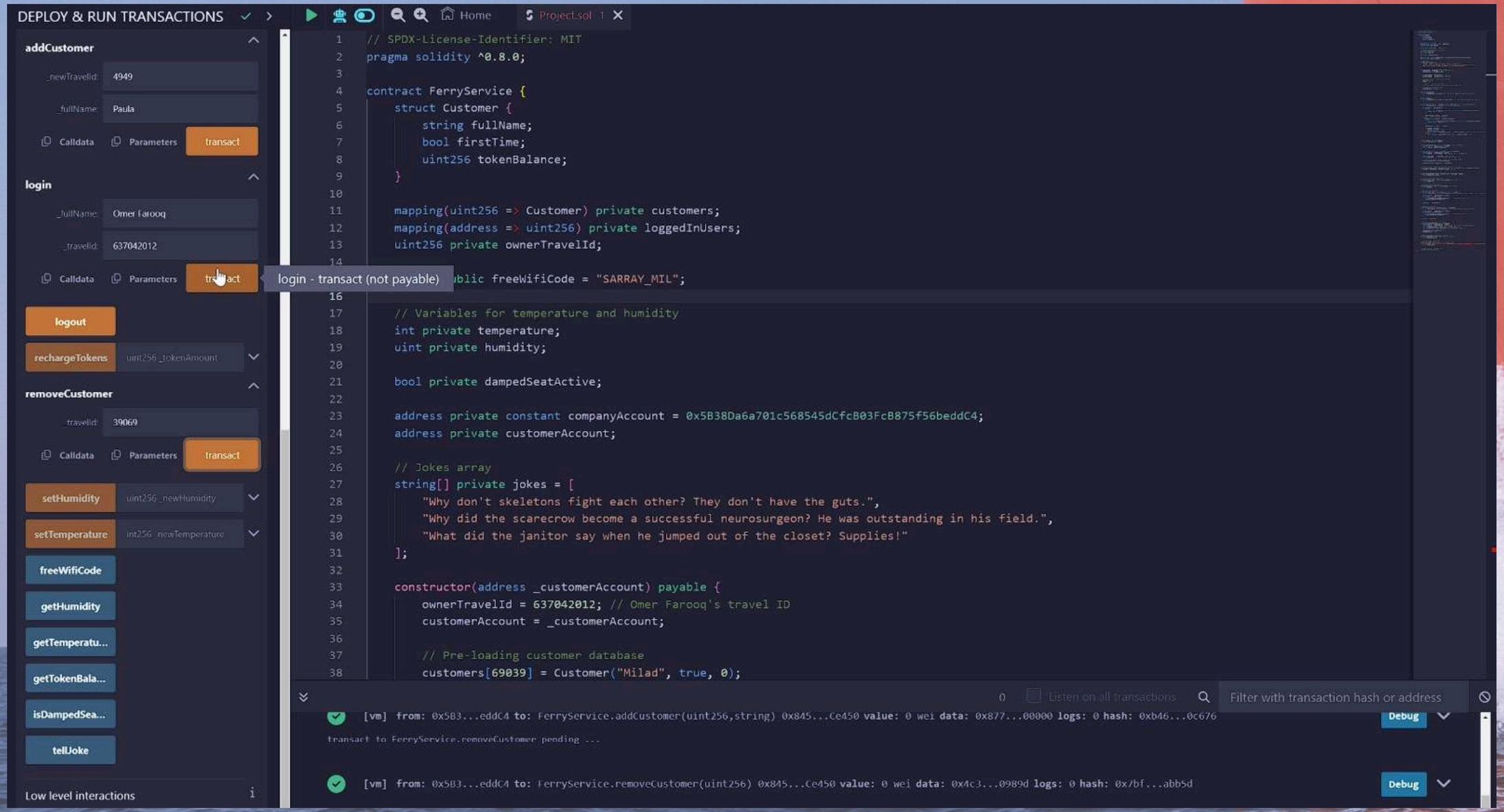

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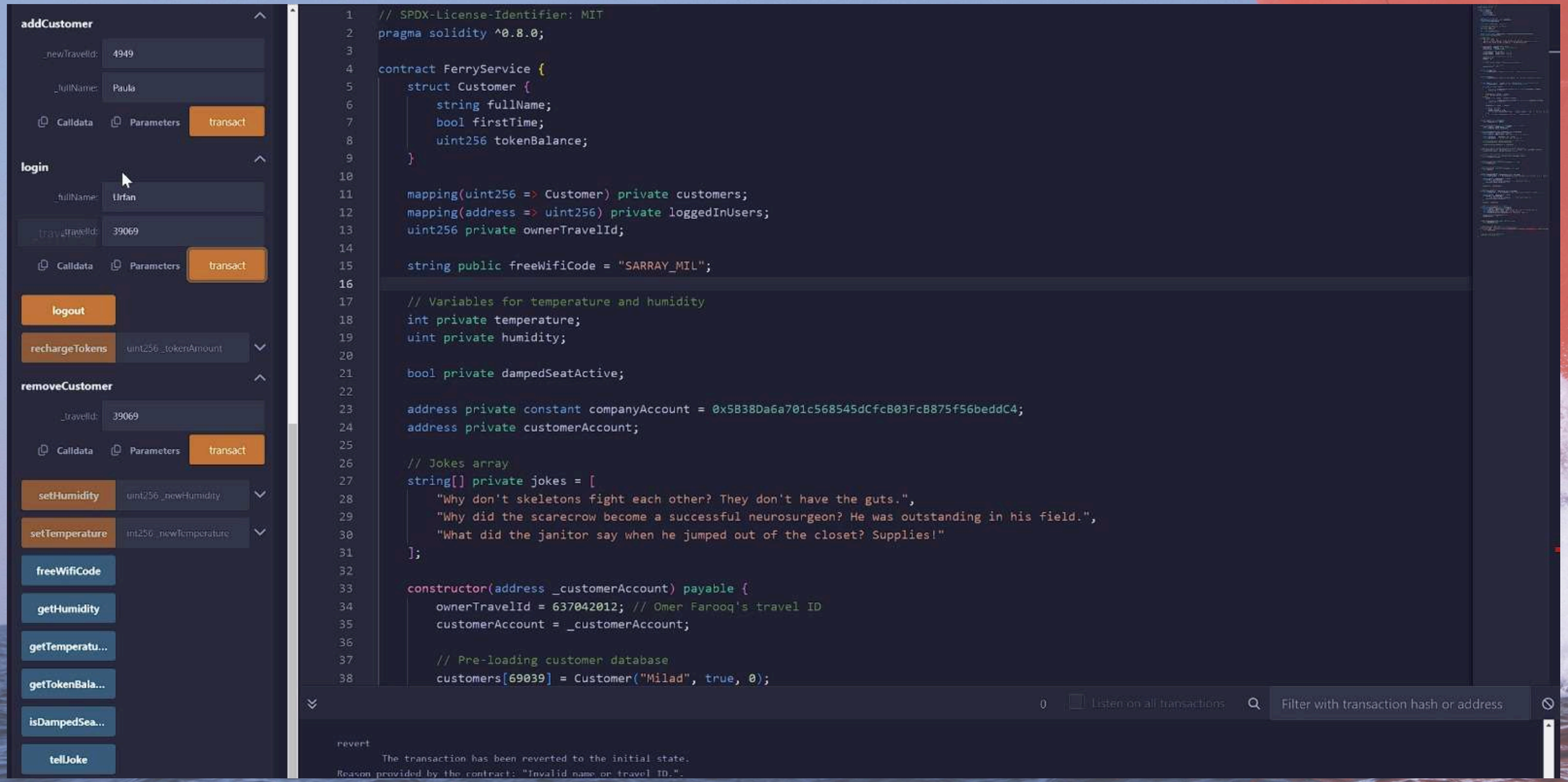

Blockchain smart contract