Report

Ink acquisition is implemented using a while loop with a sleep time of 1000 microseconds to repeatedly attempt to acquire the required ink until successful. The acquireRedInk(), acquireGreenInk(), and acquireBlueInk() functions ask for the lock, update the tank and give up the lock.

For displacement, the code breaks down the traveler's movement into small steps and updates the color trail at each step using the colorTrailUp colorTrailDown, colorTrailLeft and colorTrailRight functions. These functions update the color of the grid cell left by the traveler from its current position based on the traveler's type (red, green, or blue).

The choice of breaking down the displacement into small steps is due to the need to update the color trail in real-time as the traveler moves. If the traveler were to acquire all the required ink upfront and move in one shot, the color trail would not be updated until the traveler reaches its final destination. Breaking down the displacement into small steps allows for real-time color trail updates and better visualization of the traveler's path.

The choice of using a while loop with a sleep time to repeatedly attempt ink acquisition until successful may be due to the possibility of other travelers using the same ink source simultaneously and causing contention. In this case, repeatedly attempting ink acquisition until successful is a simple and effective way to ensure that the traveler eventually acquires the required ink without causing deadlock or other issues.

However, it may also cause the traveler's movement to be slower due to the sleep time and the possibility of repeated attempts. A more sophisticated approach that takes into account ink availability and other factors may be needed in a production-level implementation.

What does a traveler do if less than n units of ink are available in the tank?

If less than n unit is available the traveler sleep in a while loop until the n units are available preventing an unlock of the tank

Yann Youbi