ECOLE POLYTECHNIQUE DE BRUXELLES

ELEC-H410

Université Libre de Bruxelles

École Polytechnique de Bruxelles

Pandemic Project

Authors of Group 13:
JANKE Nico (540076)
VAN Dyck Emile
WOJTACH Kacper (513025)

Professor:
Quitin François

April 28, 2025

Contents

1 Introduction

The goal of the pandemic game is to produce enough vaccines to eradicate the virus before the population collapses. We have at our disposal an interface (*pandemic.h*) to communicate with the game routine.

- Every 3 seconds a vaccine clue is dropped.
- Every 5 seconds the percentage of healthy people in the population is updated.
- On random occasions an individual gets contaminated and we need to quarantine the population in less than 10 milliseconds.

To manage these events and win the game we created one task for each with different priorities. We also have a task dedicated to printing the game state on a LCD screen.

2 Tasks and Synchronization

2.1 Quarantine

This task has the highest priority of all our tasks. All it does is wait for the *QuarantineStart* binary semaphore to be available. This is triggered by the contamination. When the semaphore is available the task starts the quarantine. This is done in time because of the priority of the task.

2.2 Vaccine

The *vaccineProductionTask* has the second highest priority. It waits for a clue to be released to start producing a vaccine. That way we start producing as soon as we get a clue. This is needed because we have 3 seconds to produce a vaccine after the release.
When the vaccine is produced we ship it immediately. Once this is done we give the lcd and lab semaphores. The first one is to notify the LCD task that the game state has changed and the second one is to notify the Medicine task that it can producce or ship a medicine.

2.3 Medicine

As specified is the previous section, the *medicineProductionTask* is notified by the vaccine task when a vaccine is shipped and there is time to produce or ship a medicine. This task because of its lower priority and the fact that it has to wait for the vaccine task only runs when there is time between vaccine production.
This will be more visible in the logic analyzer traces.

2.4 LCD

This last task is the lowest priority one. It is notified by the vaccine and medicine tasks when the game state has changed. It will print the game state as specified in the specification.

3 Logic Analyzer Traces

4 Conclusion