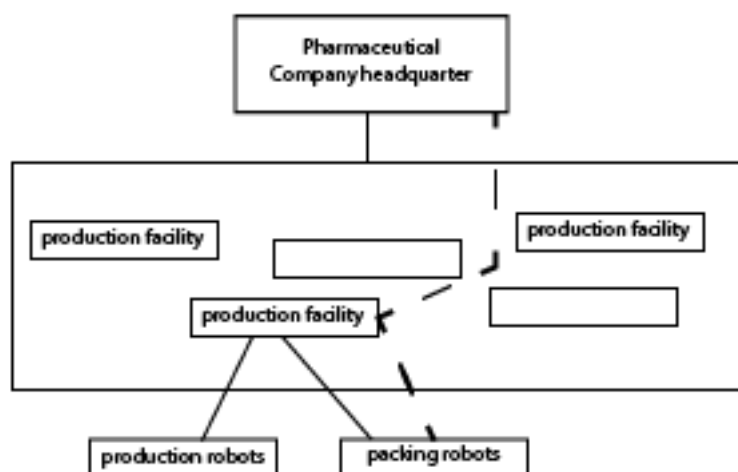


1 Introduction

In the actual context of the Covid-19 pandemics, the good news just came. Some pharmaceutical companies just announced that they found an efficient vaccine to fight against the SARS-Cov-2 virus. But they know they have to deliver the vaccine to all countries around the world and they need our help to serve all the requests. The pharmaceutical company owns multiple production facilities. Each facility has production robots creating vaccine doses and packing robots that pack the doses. They need our help to create a proper plan by using Java Concurrency to distribute all the ordered doses in time to end the Covid-19 crisis.

2 Description



Pharmaceutical Company headquarter - is the main file who generates the number of production facilities, the size of their grids and the number of robots, it spawn the robots when the program starts but also while the threads are running.

The production facility receives the grid and a set with the robots locations, it runs the production robots and packing robots synchronously.

The production Robots - are running on its specific thread generating vaccines on the grid. The packing Robots - are reading the vaccines from the production facility and trough it send those to the HQ.

3 Methods

1. Production facilities : are between 2 and 5

Matrices sized between 100 and 500

Has its list of production robots, packing robots and a set of the vaccines serial number

2. Production robots: Are created in the beginning and spawned randomly through the program run

they can move up, down, right, left, but cannot cross the borders (r_i - robot, e - empty cell, v_i - if it's the matrix of vaccines it represents a vaccine)

a possible move done means a vaccine done

if it is surrounded the thread sleeps for between 10-50ms

if the dose is created it is stored in the matrix of the production facility

after a dose is created the thread sleeps for 30ms

they work until the number of declared iterations are done

3. Packing robots : they are connected to the HQ through the production facility and are waiting for the vaccine doses

they access the vaccine doses and deliver them to the company HQ

the number of robots is known

4. The Pharmaceutical Company headquarter : contains and creates all the production facilities creates and assigns the robot to the production facilities