Introduction

Thank you for applying to AltoTech and we appreciate your interest in joining our team. As part of our interview process, we have prepared a take-home assignment for you to showcase your skills and problem-solving abilities.

You will have a total of 5 days to complete the assignment. We kindly request you to complete the assignment in Java, but you are free to choose any 3rd-party libraries you are comfortable with to complete the task.

In case you encounter any uncertainties or ambiguities during the assignment, please feel free to make reasonable assumptions. However, kindly state your assumptions clearly in your submission.

Once you have completed the assignment, please upload the code and any relevant documentation to a GitHub repository. We kindly request you to share the repository with the email addresses kwarodom@altotech.ai and sirirat.k@altotech.ai.

Assignment #1

The installation of an IoT tracking device in a plant allows for the measurement of CO2 emissions from a machine. According to the report analysed by AltoTech software, the equipment's efficiency has progressively decreased over time, leading to a concerning trend of increased CO2 emissions. The quantity of CO2 released is closely related to the cumulative amount of CO2 emitted in kilograms, and this can be determined using cumulative matrix rules.

Sample Calculations

Based on the assumption that the machine will remain unaffected, weekly measurements of CO2 emissions have been taken. These values represent the expected emissions, assuming no degradation of the machine.

Week 1	Week 2	Week 3	Week 4	Week 5
200 kg	180 kg	120 kg	150 kg	220 kg

The cumulative CO2 emission rule is applied to estimate the actual emission values as the device reaches specific cumulative CO2 emission thresholds.

Rule Range	Cumulative CO2 Emission Start	Cumulative CO2 Emission End	Increasing Percentage
1	0 kg	380 kg	100%
2	380	600 kg	120%
3	500	-	150%

Thus, the anticipated CO2 emission values are as follows:

Week 1	Week 2	Week 3	Week 4	Week 5
200 kg	180 kg	144 kg	195 kg	330 kg
200x100%	*180x100%*	*120x120%*	*(100x120%) + (50x150%)*	*(220x150%)*

Your task is to create a solution using Java that has the following input, output:
- Take 2 inputs:
  - The expected emissions values, assuming no degradation of the machine.
  - The cumulative CO2 emission rules defined by users. Users can arbitrarily define the rules, cumulative starts, cumulative ends, and increasing percentages
- Output: the anticipated CO2 emission values

Your solution should contain instructions for running the program, codes, tests, and the assumption or constraints that you make.