Coder-Maker Volunteer Competition
A partnership between Bodenseo and Coder-Maker

Description

Short description

The aim of the competition is to create a virtual game that simulates a real life problem and enhance your skills in Python programming and data analysis. The competition is all digital (without physical making).

What do you win?

The winner of the competition wins a course on Python in Germany with Python expert Bernd Klein. The course will take place in a German city (Munich, Berlin, Frankfurt, …) or at the beautiful Lake Constance area, close to Switzerland.

Full description

The task is about elevators and the simulation of their usage. Elevators seem to be a modern invention, but at a closer look you will find out that they are older than 2000 years. It goes back to the Roman architect Vitruvius, who claims that it has already been invented by Archimedes. Anyway, elevators became a necessity with the birth of skyscapers.

The idea for this task was born in a hotel in Berlin. Elevators - as most most people know them - only move, if buttons are pushed. If you board an elevator and push the button for the fourth floor, it will go to this floor. It will wait now on the fourth level until either somebody boards the cabin or somebody puts a button on another level to call an elevator. The three elevators in this hotel work differently. First of all, they are waiting most of the time at ground floor. After taking one or more people to the desired destination, an elevator will immediately return to the groundfloor, maybe taking in passengers on intermediate floors on their way down.

This way a new guest arriving at the hotel will nearly always find at least one of the three elevators ready to board. This means nearly no waiting time at ground-floor, but on the other hand, you will have to wait on all other floors with almost absolute certainty.

You can see this behaviour in the following example simulation in the picture:

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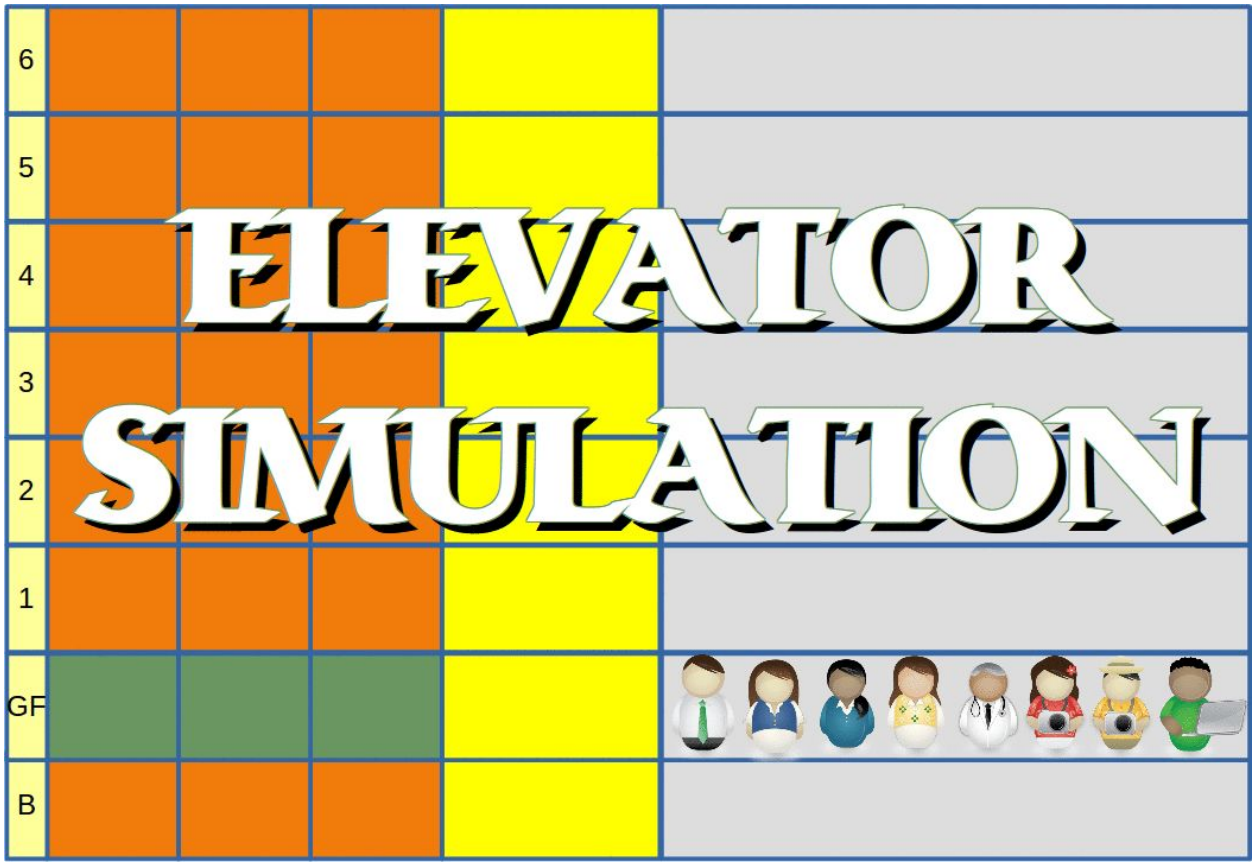

The task consists in simulating the movements of the elevators. We will count the number of levels the elevators go up and down. If a person uses an elevator from the ground-floor to the third floor, the elevator moves three levels. If it moves back to ground-floor, the total number will be six levels.

We can write a program, simulating people randomly coming into our hotel and move to a random floor. They will remain for a random time on this floor - most probably in their room, before they go down again or maybe into the basement. In the beginning our hotel is completely empty, after this we have to keep track of the people on the different floors. We also have to simulate the effect if people go down from 5th floor and pick up people on other levels.

We compare both kinds of elevator behaviours, i.e. the “normal” behaviour and the “return to basement” one.

Timeline
The competition kicks off in April with a virtual meeting with Mr. Bernd Klein will be set giving you insights into the competition and responding to you questions. A second meeting with Mr Klein will be assigned to announce the winners of the competition.

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Resources

You are welcome to use the online course created by Bernd on this site: Python Course

Rules and regulation

- You have to be an active Coder-Maker volunteer
- You have to register for the competition by May 2, 2018 on this link (we will create it next week)
- You have to submit your project by July 1 at 00:00 AM