**Object Oriented Programming**

**Ex1**

Part A

**By:**

Hagai Hen 313414872

Nir Geron 315874925

1) **Literature**:

1. <https://github.com/00111000/Elevator-Scheduling-Simulator>
2. <https://stackoverflow.com/questions/69943231/offline-elevator-algorithm>
3. <https://www.geeksforgeeks.org/smart-elevator-pro-geek-cup/>
4. <https://studylib.net/doc/7878746/on-line-algorithms-versus-off-line-algorithms-for-the-ele>

**Offline Algorithm**

This time we've ask to do an elevator's algorithm for offline requests, which means, We know all the calls ahead of time.  
We started with defining class for building and call to make it more readable for debugging and understanding the code.  
After that we start with the main class of the algorithm that named "offlineAlgo".  
The class's job is to allocate the right elevator for the specific call in the most effective way taking consider the previous and next calls.  
  
**How the class "OfflineAlgo" works**

At the main of the class, we define a list named "Calls" that saved the whole appropriate elevators.  
and another list named "tmpCalls" that equal to Calls and check each call in accordance with the current placement made so far and put the chosen elevator in the next cell at Calls.  
The algorithm works mainly according to the timeline and prioritizes the elevator by checking availability after finishing her last mission

In "calculateTime" we calculate each elevator at the specific operation, the function consider the whole floor time, speed and compare it to tmpCalls which suppose to help us to choose the elevator that will reach the destination the fastest.  
  
In "timeForList" we the time for each elevator

Diagram

Description automatically generated

**Running results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| calls | Case | Total waiting time | Average waiting time | Number of incomplete calls | Certificate |
| Calls\_a | B1 | 11292.0 | 112.92 | 0 | -471884437 |
| B2 | 11526.0 | 57.63 | 0 | -9853824 |
| B3 | 8768.0 | 87.68 | 0 | -449153586 |
| B4 | 2579.0 | 25.79 | 0 | -235439520 |
| B5 | 1862.0 | 18.62 | 0 | -144289427 |
| Calls\_b | B1 |  |  |  |  |
| B2 |  |  |  |  |
| B3 | 506090.44 | 506.09 | 143 | -1665295537 |
| B4 | 194662.913 | 194.66 | 24 | -750979474 |
| B5 | 40343.0 | 40.343 | 0 | -51801149 |
| Calls\_c | B1 |  |  |  |  |
| B2 |  |  |  |  |
| B3 | 569192.829 | 569.192 | 162 | -2119736169 |
| B4 | 194075.951 | 194.075 | 5 | -750994225 |
| B5 | 40796.0 | 40.796 | 0 | -51801149 |
| Calls\_d | B1 |  |  |  |  |
| B2 |  |  |  |  |
| B3 | 528653.301 | 528.653 | 83 | -1737391969 |
| B4 | 189717.061 | 189.717 | 7 | -768264932 |
| B5 | 41664.0 | 41.664 | 0 | -56468048 |