Dependable Systems
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Assignment 1

Deadline: 6 June 2021 at 23:59 (German time)
Late Deadline: 25 July 2021 at 23:59 (German time)

You can hand in this assignment as a group. Please don't forget to write all your names on your solution. Hand in your solution as a single pdf file in the dcms. If you hand in by the regular deadline, you get all the points that you earned on this assignment. If you hand in by the late deadline, your assignment will be corrected and 30% of the points that you got on this assignment will be deducted. You cannot hand in an assignment twice. You need 50% of all assignment points in order to get the exam admission. You can get 18 points in total of which you can get 9 points on this assignment.

Sebastian was put in charge of the five public indoor swimming pools in an area. More precisely: he is to make the pools more cost-efficient by utilizing all kinds of digital technologies and automating as many processes as possible. If he is not able to cut the costs enough, some of those pools will have to close forever. The pools are very much liked by many in the community and frequently used for exercise and recreation. If one of these pools closes, then the people in the neighbourhood of that pool would need to travel some distance to reach the next pool. Luckily, the public transport is excellent. So, they would still be able to go swimming, but it would be much more inconvenient for them as they would have longer travel times.

Sebastian is very eager to find the best solution for the community and already got the operating costs low enough that only one pool would need to close. In order to save the last pool, he would need to cut more costs by making the ticket sale online-only for *all* the pools. Tickets would then need to be bought over a website or over an app, but could not be bought on-site anymore. Even though this would save the last pool, Sebastian is reluctant. He is aware that some of the swimmers are elderly people who have no access to a computer or a smartphone, and could then not buy tickets anymore on their own. On the other hand, he knows that there is no other way to save all the pools.

Assume that the following holds:

- If Sebastian does not implement the online-only ticket system for all five pools, one pool needs to close. This would affect about 15000 people, who would have to go to a pool further away, which is inconvenient for them. There is nobody (not even elderly or disabled people) who would not be able to go to a pool at all.
- If Sebastian implements the online-only sale of tickets, then all people without internet access would not be able to buy tickets on their own. This would mean that about 500 people could not buy a ticket without help, which would be inconvenient for them. About 3 people would not receive the needed help, and would not be able to buy tickets at all. This would mean that they could not visit any pool at all, as all five pools in the area would have the same online-only policy.
- The *only* people for whom Sebastian's decision makes a difference are the (potential) visitors of the pool. The employees of the pool, for example, will be laid off, but they already have an offer for a new and equally good job.

- Sebastian is highly competent, and there really is no way to get any other outcome than the mentioned ones. He can either implement the online-only ticket system, or not do so. Also, there are no unmentioned side-effects.
- Sebastian knows all of the above and is justified in his beliefs.

Evaluate whether it is right or wrong for Sebastian to implement the online-only ticket system...

(a) (3 points) from the perspective of Scanlon's Contractualism.

(b) (3 points) from the perspective of Expected Utility Preference Utilitarianism.

(c) (3 points) from the perspective of Classical Utilitarianism assuming in addition to the above: if Sebastian implements the online-ticket system, two children would drown in the swimming pool that would have closed had he not done so; if he does not implement the system, the two children will live and no other person will die that would not have died otherwise.

Make the step-by-step application of the respective moral theory explicit, i.e. do not only give the overall result, but make clear how you come to this result by evaluating *every* relevant component of the respective moral theory. Your answers may be conditional.

Hint: It might be helpful to take a look at the solutions to the training exercises in order to get an idea of how to structure your answers.

Note that the points of a comparable exercise in an exam would be more fine-grained than they are in this assignment. But don't worry: we will correct your assignment in great detail such that you will be prepared for an exam.