

# DAT405: Assignment 6

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## Part 2

### Question 1

a)

Vivaksa's predictive ability will most certainly not be accurate, when deployed to the general public. Due to the collected data being based on a small set of people, also which represents a fraction of world populations diversity, the model will have elements of biasness. Furthermore, due to the small age range of the data, health predictions of individuals which does not reside within this age range may receive inaccurate predictions, since vital measurements do vary for different age spans. Additionally, collecting data over the short span of a month may lead to the model overfitting to an instance of deviation of the persons daily life. Partially because of these reasons the end modeling product will not be a good representation of the general public.

b)

There are a number possible improvements that can be made. Increasing the size and diversity of the data set, regularizing, as well as increasing the time span and the number and type of training parameters, such as diet and consumption of recreational drugs (might have a positive or negative impact). In the new larger data set, a variety of ages should be represented as well.

### Question 2

If taking on the insurance company's notion of fairness, raising premiums for people opting out of the program would probably yield the same result as adding them to it, as more people who believe they would have to pay a higher premium are more likely to opt out of the program. Another consideration is that the data set might not be representative of the population on which the model will used. In addition to this, the training parameters might be biased. An example would be people who might be healthy in general, but cannot move

due to underlying medical conditions or age. These people would have to pay more even though their overall health might be average. Taking cardiovascular health as an example, based on the training parameters, a number of people with average cardiovascular health but that do not move extensively might be opted in for a higher premium incorrectly. Overall this indicates that there is a good chance that the program can undermine the insurance company's own value of fairness.

## **Part 3**

### **Question 1**

Depending on the implementation of the model, it might not be clear why a person is selected to be criminal, nor what attributes that signify a criminal, for example in the case of a neural network implementation. Furthermore, a person can modify its appearance to alter the prediction thus making a criminal be determined a non-criminal and vice versa. It is neither apparent if the model discerns between different types of criminals. For instance, if the law enforcement does not get information about if a person is a non-violent criminal, they might go into every encounter with this person with a bias for personal security and using excessive force in any altercations.

Additionally the model needs to have exceptional fairness, which most probably is difficult to achieve, since in the case of incorrectly determining an individual to be a criminal would ruin their life when they in fact are innocent.

### **Question 2**

First and foremost, extracting the political stance from the population without their consent is a major privacy violation and unethical in its own right, as this might put them at risk for people who wish to use it for nefarious reasons. While it may not be a one-to-one mapping to this example, Facebook's involvement in the Rohingya genocide in Myanmar is an prime example of how machine learning in consort with bad regimes can impact people of a certain political view in a catastrophic manner. Even if the current regime in a country with access to this information is benevolent, others that are not may follow. Secondly, the classification might be incorrect due to the model lacking data, or because the data set is biased, as well as a number of other reasons. Consequently, it is more likely that the wrong person might be charged with a crime they did not commit.