Of all the careers one could choose to pursue, there is no field that has more responsibilities than the field of engineering. Engineers build and develop the technology and infrastructure that the world runs on. That means that the safety and well-being of the public depends on the ethics that each engineer chooses to follow. Having poor ethics means that some product or piece of infrastructure could be purposely built to poor standards or have aspects that could harm people. Ethics can also be a gray area. Some people may view an ethical situation differently than others. For example, one recent ethical question involves self-driving cars. If an autonomous car was in a situation where it had to choose whether to save the life of the passenger at the cost of someone outside of the car, what decision should the car be programmed to make? Since ethics can be complex and subjective, a code of ethics is one way to define a set of standards that will hold every engineer accountable to the same level.

When I face an ethical situation, I try to make a decision that always will benefit the greatest amount of people while also harming as few as possible. Most of the other factors that go into a decision are based off of societal norms that have developed alongside humanity. As stated previously, a solution to a difficult ethical problem is rarely completely right or wrong, but almost always somewhere in between. Revisiting the autonomous car situation, if I was placed in charge of making a decision of how to program the computer to respond, I would chose that the car places the lives of people outside of the car over the passengers inside the car. By using my ethical judgment to harm as few people as possible, any situation where the car would have to hurt more people outside of the car compared to the number of passengers would be unacceptable. Using norms and laws that have been previously established, I would also argue that the people in the autonomous car have a choice to use the car and accept the possibility of death or injury. The people outside of the car do not have the same choice available and thus should be prioritized to not be injured in an autonomous accident.

In the ethics meeting we discussed a slightly less grim case study about the recent Volkswagen scandal. The scandal surrounded a so-called "defeat device" that was installed in eleven-million Volkwagen cars that gave incorrect nitrous oxide readings in order to pass emission guidelines. Everyone in the discussion group had the same opinion that what Volkswagen did was wrong, but we could see different ethical considerations based on those that were involved in the scandal. We agreed that the facts weren't clear enough to decide who was directly to blame for this scandal, so it could have been decided by someone in management or some low level employee. If the decision to implement the device was made by someone high up in the company, then they were clearly violating a lot of ethics making the decision. The more ethically questionable actions lie on the engineers developing the cars, who's jobs may have been lost if they dissented. If that was the case then they may have complied in the case of self-interest, where the same cannot be said of management. However if the decision was made by some employees trying to make a strict deadline to develop the car based on guidelines set up by upper management, the ethically wrong decision lies with the engineers. The most ethical solution would have been for the device to not be used, but in this case it isn't clear how that solution could have been executed because of the fact that we don't know who in fact made the wrong decision.

For computer engineers, ethical decisions will follow the IEEE Code of Ethics. For the case study described above, three parts of the code stand out as broken by the decision to use the "defeat devices". The first is also the first off the list, which is to accept responsibilities in making decisions that are consistent with the safety, health, and welfare of the public, while disclosing any factors that

might endanger the public or the environment. Because so much excess nitrous oxide was released unbeknownst to the public, it isn't clear how much harm was exactly done to the environment. With climate change becoming a huge threat to humanity though, it can be guaranteed that harm was done irregardless. The second is to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist. In the case where someone in management made the decision to have the device installed, both the management and engineers violated this code. Management violated the code because they chose to lie in order for their cars to pass environmental regulations at the benefit of shareholders by making a larger profit, avoiding the costs associated with redesigning an engine that passes emission regulations. It also is a conflict of interest for the engineers that installed the device because they most likely had a conflict of interest between keeping their job instead of disclosing the action they were instructed to do. Even if the engineers made the decision on their own, it was likely an effort made in order to keep their jobs, which was opposed to following emissions guidelines. In all the cases mentioned above, someone disclosing their conflicts of interest would have been ideal. The last code that this case study broke was to avoid injuring others, their property, reputation, or employment by false or malicious action. Besides the damage to the environment, the decision made by a few employees at Volkswagen had a huge impact on the whole company because of the world's reaction to the scandal. This means that Volkswagen will have to live up to the scandal, and will most likely have years of poor sales because of this new lack of trust between the company and the public. This will hurt the company financially and could result in the company laying off a large number of its employees in order to stay afloat. Thus the actions done by a few inside the company could result in many of their peers being laid off.

There are seven other codes not mentioned in this essay. Just because those codes aren't related to this case, does not mean that they are less important. The code of ethics have to be broad in order to address any situation where ethical guidelines are needed. That way no matter what the situation is, there will always be something that will point the engineer in the right ethical direction.