As a means of reflecting upon the articles, answer the following questions:

1. Why does Langdon Winner believe that decisions about technology design and engineering carry political weight? Provide at least one example in your answer.

He believes that there are two ways in which technology design can carry political weight. One is the technology designs that can settle an issue in a particular community and second is man-made systems that are strongly compatible with particular kinds of political relationships.

2. What is a technology that has been released in your lifetime that created a political outcome? Explain what happened. Note that the article was written before you were born, so you cannot simply state examples given there.

Tiktok, or short-form video platforms in general. TikTok has served as a platform for users to share their perspectives and it has become very popular in recent years. But it has been accused of promoting political polarization. The platform's algorithm-driven content recommendation system has been criticized for amplifying the echo chamber effect in political views. Also since Tiktok is owned by a Chinese company, some people are concerned that it might be used as a tool for propaganda and affect electives.

3. Identify an emerging technology or technical product offering area that you use or are interested in.

I'm interested in autonomous vehicles, or self-driving cars.

4. Who are the ideal users and user cases?

• Describe an ideal use case for this technology

• Who does it benefit most?

The ideal use case is that people can use autonomous vehicles to do daily commuting, which saves people's effort to drive. The people who benefit from this are those who drive on a daily basis. Elderly people and disabled people can also benefit from autonomous vehicles since it makes their travel easier.

5. Who is most vulnerable to being negatively impacted?

• Describe the worst case scenario for how this technology is used

• Who do you think is responsible (if anyone) for the worst case described above?

The worst case is that the use of autonomous vehicles can cause traffic accidents. If not thoroughly tested, there are safety risks of car crashing or car hitting pedestrians. If such accidents happen, the car company that produces the autonomous vehicle should be responsible for it.

6. Is the technology described in "Ad Empathy" a best or worst case scenario?

It's a best case scenario since the author mentions the appropriate use of the product and points out the field that the technology should not be used such as the medical field. The product can help companies to have more effective advertising campaigns.

7. Engineers should recognize ethical and professional responsibilities in engineering situations and make informed judgments which consider the impact of engineering

solutions in global, economic, environmental, and societal contexts. How do aspects of the emerging technology or technical product offering that you use or are interested in impact engineering solutions in
a. global context
b. economic context
c. environmental context
d. societal context.
For each contextual area, please identify potential issues, explain their relevance to the technology, explain any interplay between these areas, and explain how you might approach design and use in the emerging technology or technical product offering to mitigate any adverse issues.

The potential issue of autonomous vehicles in a global context is that there can be uneven access to it around the world. For developing countries, it can be hard for them to spread this technology due to infrastructure development. This will enlarge the gap between developing countries and developed countries. To mitigate this, engineers can design autonomous vehicles in a way that relies less on infrastructure development. By improving the vehicles functionality, they can enable autonomous vehicles' operation in developing countries.

The potential issue in the economic context is that autonomous vehicles can cause unemployment. It may damage traditional transportation industries such as taxi services. The economy can be greatly affected due to sudden unemployment. To reduce the effect, we can make policies to support affected workers and train them to work in the autonomous vehicle industry.

The potential effect for the environment is that if autonomous vehicles have been widely accepted and used in the world, the overall car usage can increase and thus cause greater emission. To mitigate the environmental damage, engineers should focus on making the vehicles more energy efficient and produce less emissions. Producing electric vehicles can be a way of achieving the goal.

In the societal context, the public may hold a mistrust attitude towards autonomous vehicles due to some accidents that have happened before. To address the concerns regarding safety, engineers should perform large amounts of testing and open the testing results to the public. Engineers should also prioritize safety considerations when designing the vehicles.

Using your capstone project answer the following questions:
• **Describe as succinctly as possible the problem your project seeks to solve**
Mastering the saxophone demands consistent practice and guidance from experts, but traditional saxophone classes can be costly. Self learning is inevitable for many saxophone players, but it can cause the development of bad playing habits which is hard to fix. Sonic Score Saxophonics is a system designed to be an instructor at home, aiming to provide an affordable way for players to avoid bad habits when self-practicing.

• If your project became a product or widely adopted, who would be the ideal user or customer?
The ideal users are saxophone beginners who need a lot of instructions when practicing. Our system will provide them with detailed feedback and help beginners improve their saxophone performance.

• Who is most vulnerable to failure or misapplication?
Sonic Score Saxophonics should be used along with additional saxophone classes. If a saxophone beginner wants to learn how to play saxophone by solely using our system, they are very likely to fail.

• If your project uses data, explain the ideal data set you could obtain and how this compares to the one most available to you.
For the audio processor in our project, we use real life saxophone music files as inputs for testing. The most ideal music file is that being played by a professional saxophone player. The one that's most available for me is the music files played by my teammate Jordan. Since Jordan is very experienced with saxophone, the quality of the music file is good for testing.

• Ethical design and realization in your project requires assessment and perhaps balancing trade-offs between global, cultural, social, environmental and economic factors. Given the added perspective extracted from the ethics readings, what considerations might apply to design and realization of your project in terms of:
a. public health
b. public safety
c. public welfare
Write a paragraph for each consideration area where you should identify issues, explain their potential relevance, explain trade-offs in the factors listed above, and explain how your project design solution addresses these issues.

a. Although our design can help improve saxophone players' performance, people might overuse our system and practice for too long. Practicing for too long without rest can have significant risks to the physical health and well-being of saxophone players. This is especially the case for saxophone beginners who lack the knowledge about saxophone practicing. To address this concern, we plan to add a warning sign on the practice page of our web app to inform the users about the dangers of over-practicing.
b. For public safety, our design is safe for the public and cannot threaten anyone's safety. There could be some concern about data leakage. To address this concern, we only store history feedback generated by our system, so that if someone actually breaks into our system, there will be no personal information being stolen.
c. For public welfare, one concern is that it might not be accessible for everyone. To solve the issue, we make our system based on a free-to-use web app and use low price sensors and controllers to build our sensor. We want to make our product available for every saxophone player and help them save money.