**Cybersecurity:**

What does it do? (600 words) What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible? [Be careful to a) not copy b) show that you understand the words that you write

What is the likely impact? (300 words) What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant any current jobs or technologies? How will this affect you? (300 words)

In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

Cybersecurity is the protection of internet-based networks and computer systems from unauthorised usage or theft. Cybersecurity is used to help protect individuals and businesses alike from fraudulent attacks or unauthorised access to private data. In a technologically advanced world, modern day hackers and thieves now scourge through the internet searching for their next victim. Cybersecurity is the practice to prevent unauthorised access to electronic data by using a number of different methods to secure online information. Cybersecurity is important as it is a means of protecting your private data and information from getting into the wrong hands. Within the past few years, the internet has seen plenty of growth and development with a lot of things moving into the ‘digital age’. Online shopping, databases and emails are all examples of this, something which was unheard of decades ago. As a result, protecting your private information online has never been more important which is where cybersecurity comes into play. This technology designed to prevent unauthorised usage or access, is now being used globally by individuals, businesses and governments to protect their electronic data. The dangers of a. cybercrime are present more than ever with so much information being accessible online, it was important to develop a means of protection. For thieves, the rise in use of technology has led to new and innovative ways to conduct their crimes with the possibility of now ‘hacking’ into private data. To combat this, ‘Cybersecurity’ was developed, joining the two words cyber, involving the internet, and security, ‘the state of being free from danger or threat’. There are plenty of different examples of cybersecurity such as authorization, authentication and encryption to name a few. Authorization is the process of controlling permissions and dictates who is able to perform certain tasks or actions. This can be used to only allow authorized people to be able to view, change information or to perform other tasks. This method of cybersecurity works by preventing hackers from being able to access critical and important information and as a result, is a means of protecting valuable information and data. Another example of cybersecurity Is authentication. Authentication is the process of verifying a user’s identity to ensure they are who they claim to be. An example of this is settings up security questions or physical verification such as fingerprints and face recognition. In regard to state-of-the-art technology surrounding cybersecurity, Fortinet provides top of the range services such as firewalls, anti-virus and intrusion prevention. Fortinet holds its reputation as one of, if not the best, cybersecurity companies around leading in its state-of-the-art firewalls and endpoint security systems. However, In order for cybersecurity to be at its highest, firewalls and encryption software will have to continually be developed and upgraded to compete against the rising threat of cybercrime and cyberattacks. Over the next few years, cybersecurity will become as important as ever, and as technology advances even more, criminals and cyberattacks will become more advanced than ever which is why it is important for cybersecurity to develop and for businesses and individuals to not take their cybersecurity lightly.

Cyber threats and attacks are a big problem and risk in modern society. With so much information being stored on the cloud, theft of valuable information and sensitive data is at risk. Furthermore, cyberattacks can also result in computer networks and servers crashing, rendering them useless and vulnerable. The impact of these attacks can cause damage in the millions, if not the billions if proper measures are not taken to prevent these cyberattacks. There are many different types of cybersecurity threats such as malware, phishing, trojans, ransomware and Distributed Denial of Service attack, also known as DDoS. These threats can all individually cause serious damage if left unaware of and unattended to. Every year, millions of victims fall to online phishing scams which target user emails tricking them to disclose confidential information through fake scams or other means. One of the biggest and important phishing attacks happened in 2016 when hackers managed to get a hold of John Podesta’s Gmail password. Subsequently, his emails were leaked and as a result impacted Hillary Clintons’ presidential campaign. There is no discrimination when it comes to cyberattacks with no one being completely safe from risk. As a result, the entire population is directly affected by cybersecurity and cybercrime as plenty of personal data is stored online. With new technology being developed at a rapid rate, cyberattacks are becoming more common and more advanced, leading to an increase in demand for cybersecurity jobs. With cyberattacks becoming more prevalent, it is no surprise that demand for cybersecurity jobs continues to rise.

In my daily life, cybersecurity plays an important role in ensuring that my information is kept safe and free of risk. Personally, I’ve always ensured my cybersecurity is kept up to date to minimize the online risks and harm and have always instructed friends and family to do the same. Continually updating firewalls, using strong passwords and ensuring two-step verification is set up are all simple means of effectively becoming more ‘cybersmart’ and increasing cybersecurity. An example of cybersecurity impacting my day to day life is using ad-block when browsing the web to prevent many scam links and advertisements which attempt to scam you. Furthermore, when prompted to create a password, I ensure that I make a strong password to prevent hackers and unauthorised users from breaking into my account. I have stressed the importance of having a high level of cybersecurity to my family and friends in order for them to feel safe online.

**Machine Learning**

What does it do? (600 words) What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible? [Be careful to a) not copy b) show that you understand the words that you write

What is the likely impact? (300 words) What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant any current jobs or technologies? How will this affect you? (300 words)

In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

Machine learning is the process in which computer algorithms or artificial intelligence automatically ‘learn’ or improve when provided with data. Machine learning artificial intelligence or algorithms collate and use massive amounts of data in order to make a very accurate prediction or decision without being told to. Machine learning is a very advanced technology constructed with mathematical algorithms and pattern recognition to siphon large amounts of data in order to provide the best answer relative to the users needs. The beauty of machine learning is that it is completely automatic with no need for the user to input anything which allows the machine to continually learn and improve upon itself. A few examples of machine learning include Tesla’s self-automated driving cars, Netflix and YouTube recommendations and fraud detection used by the ATO. Another example of machine learning being used is through Apple’s Siri. Siri learns by adapting to the user’s individual language usages and speech patterns to generate personalised responses based on these pre-existing patterns. This technology is highly advanced and could be considered state of the art due to its worldwide usage and ability to adapt to individual accents and is available in different languages. One of the main big users’ of machine learning is none other than Google. Google has integrated machine learning into many of its core platforms such as Google Images, YouTube and Google’s self-driving car. Image recognition is the process in which all the pixels in an image are converted to a text file. An example of this is speed cameras reading number plates in which the pixels surrounding the number plate are analysed and translated to text form. Google has also applied machine learning to its video platform YouTube to provide video recommendations based on what the user has previously watched and liked to provide a better and more personalised service. Machine learning is made possible through the invention of computers and discovery of new algorithms. Over the next 3 years, it is expected that self-driving cars will pave the way for future driving. However, this is still years away as laws and regulations will need to adapt and change for this to take place. Furthermore, human error is the main cause for crashes and deaths which occur in modern society and this is something that perhaps can be eliminated with the introduction of self-driving vehicles in the future.

The impact of machine learning is highly evident in day to day life and is used throughout the world without people even realising. Machine learning has left a substantial impact on modern society as most people interact with machine learning daily. Google and Apple is just the tip of the iceberg when it comes to machine learning. Self-driving cars is on the rise with many automotive manufacturers investing heavily into this market and are hoping for it to be finalized in a couple years. Furthermore, machine learning is also used in healthcare where radiologists use algorithms to analyse millions of CT scans to look for early signs of lung cancer. As a result, all the tedious and manual labour conducted by humans is now made irrelevant with the introduction of machine learning which can be viewed as either a good thing or a bad thing depending on the perspective. An individual losing their job as a direct result of machine learning can be a bad thing however an automated process eliminating the use of human error can be seen as a good thing. Machine learning has paved the way for more personalised and better services due to individuals having their patterns recognised and as a result, the machine is able to cater to individual needs personally and to a higher standard than if the same result was applied to every individual.

In my daily life, machine learning plays a big role in my day-to-day activities. The majority of the population interacts with machine learning almost everyday as it integrated into our daily tasks such as checking the weather or even watching your favourite video. Machine learning forms the basis for many recommendations, as the computer automatically generates these recommendations based on previous data collected. The automation process of machine learning to generate these predictions based on previous data plays an important role in many things affecting many individuals from across the globe. Not only does machine learning affect members of my family or my friends, it also affects most of the population as many people use and rely on machine learning. Without machine learning, humans would have to manually review very large amounts of data which would be very tedious and demanding. The use of computers and machine learning in modern society eliminates this issue and is also much more highly effective due to human errors being made redundant.

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