# Section 1:

Brief introductory paragraph about data privacy.

One important privacy harm which can impact people of all statuses is aggregation. This is the collection and analysis of many pieces of data which individually may be unrevealing, but when put together, can provide information that a person may wish to keep secret (Solove, 2011). Generally, this is then used to target advertisements in a way that generates more clicks, or more purchases, however it has been used for much more heinous purposes. An occurrence of this was the initial purpose of Facebook data collected by Cambridge Analytica in which data was collected for the purpose of aggregation, to teach a model which could take a user’s Facebook data, predict their political tendencies, and then target adverts towards them (Hern, 2018). This was intended to allow certain US political campaigns to target adverts, to win more votes (Hern, 2018). This shows how aggregation uses innocuous data such as personality test data to reveal quite private data, such as political allegiances.

The Cambridge Analytica scandal was an example of how dangerous aggregation can be, as people don’t notice the amount of their personal data they are putting out to the public when it is released through lots of small pieces of information. However generally the average person wouldn’t think that they would be a victim of this privacy harm, which makes it more dangerous, as people still don’t take much care about what they post and how someone could use the information they post against them despite the increased awareness due to this high-profile scandal.

An example of data exploitation was the illegal sharing of data between political group “Leave.EU” and insurance company “Eldon”. Despite being distinct legal entities, the two companies shared many directors and staff, as well as Eldon being a major donor for Leave.EU. During the Brexit campaign Leave.EU sent almost 300,000 political advertising messages to Eldon customers, and Eldon sent over 1 million insurance emails to Leave.EU subscribers (Leave.EU Group Limited and Eldon Insurance Services Limited v The Information Commissioner, 2021). This exchange of sensitive personal information raised concerns about privacy, and allowed both companies to gain outreach they mightn’t have obtained legally.

Privacy exploitation is a serious problem of our era as nearly every website uses cookies with the premise to improve the services they offer but in reality that collected data is usually sold further. The collected data can be used in updating AI datasets and it is more common to deliver targeted ads (Sundaram, 2021). One reason why people might want to protect their privacy is that personal details like race, religion, or sexual orientation can be used to discriminate against someone in employment, housing, or even insurance (CybeReady, 2024). Another reason can be that sharing personal information can lead to identity theft like criminals opening accounts using the victim’s name or even stealing the victim’s money (ICO, 2024).

# Section 2:

Digital inequality is a very broad issue facing society as it becomes more and more reliant on digital technology in everyday life. Public services like banking and healthcare are being moved online, which leaves people who don’t have access to the technology falling behind. People can be digitally excluded through a lack of access to technology, mostly through being unable to afford the high costs of broadband and the devices themselves (Taylor, 2023). They can also be excluded through lacking the skills to use the technology, generally found in older adults who grew up without it.

Digital divide for older adults is a major exacerbation of inequality for the elderly, due to many factors that make it difficult for them to access online and digital services. This is becoming increasingly concerning due to the number of services going digital, such as banking, health, shopping and communication. Around 50% of European adults over 50 are not online. While this varies between countries, older adults universally use the internet less than younger people due to many factors such as lack of experience with computers in the workplace and earlier in life, lack of internet use by their peers and other individual factors like age, social class and area of residence (Konig et al, 2018).

Paragraph on analysis of digital inequality in older adults.

As digital technologies keep evolving, the difference between people with high and low incomes becomes more noticeable and proves that digital technologies are exacerbating inequality. Low-income people are less likely to have access to the best devices and digital literacy which can leave these individuals behind in their attempt to participate in the digital economy (Dalley, 2023). The only chance of these individuals are the bridge programs that provide affordable devices and training programs, helping them to stay up to date in this continuously developing digital era (Rolle, 2023).

To look closer at how digital technology tends to exacerbate the inequality of being low income, there is one key point to discuss. There is an inherent perpetuity to digital poverty, especially as companies and education lean more and more on doing things digitally, from only being able to access services online, to online learning. “Digital poverty sets up a vicious circle: those without digital connectivity lose out and become financially poorer.” (Institute of Development Studies, 2022) shows just how major this perpetuity is, and the report goes further in depth into how digital access can add to the already existing ‘poverty premiums’, if anything furthering the poverty of those who are already in a tough situation financially.

# Section 3:

This section covers important legal and socio-ethical challenges in computing in the future, meaning what issues are anticipated to arise in computing in the future, and how computing professionals can expect to be impacted by them. Since some of these challenges may go unsolved, the section may detail the way in which the challenges are resolved, or the way that the practices and opportunities of computing professionals will change. For clarity, challenges will be defined as innovations which break the law, or cause harm to people in some (likely) unintended way.

One of the big issues with the emergence of artificial intelligence is how the law treats works created by these programs. With less advanced technologies, the human behind the work still got the intellectual property rights of it, because the computer program was treated as just a tool (Guadamuz, 2017), however modern A.I programs make the artistic decisions themselves, with the human having almost no part in the creative process. Most countries say in their copyright laws that only works created by a human can be copyright protected (Guadamuz, 2017), but this could cause problems as it disincentivises investment in A.I. technology, as it would generate less income for its users.

The next decade presents a complex legal landscape for computing professionals. Data privacy, AI ethics and cybersecurity threats demand a very careful approach by the professionals because this requires all the developers to be open to collaborating so they can make software safer for public use. Also, AI engineers need to adopt a legal framework as they play a crucial role in developing secure and ethical AI. The future demands professionals who are not only technically skilled but are also ethically right, creating software and shaping technology for a better and secure world (Creese, 2023).

Paragraph on job automation with robotics

Resolving job losses to robotics will be a very difficult and complex task which companies will have to deal with over the coming years. Re­­designing jobs to make use of robotics is crucial, so people won’t be replaced by robots but rather work alongside them to make their work more efficient, like how other technologies have required adaptation in the past. People have been suffering job loss due to robotics for decades; it is estimated that 1.7 million jobs have been lost to robots globally since 2000 (Teamstage,­ 2024).

# Personal Reflections:

**Scott Currall (39033058):**

The highlight on social, ethical, and global issues that SCC141 lectures have focused on this term has really opened my eyes to the extent of the computing industry’s impact on daily life for everybody. One example that particularly stands out for me is the impact of computing on the climate. The amount of energy allocated to computing is growing exponentially, especially with the new incredibly resource intensive AI models that are rising in popularity at the moment. With the effect the sources of this energy are having on the climate, I believe this is an area where the entire computing industry should focus its attention to help prevent irreversible global damage.

Another issue that the lectures highlighted to me was the social inequality that an internet dependent society brings. Whether it’s the lack of digital literacy of willingness to use technology for older adults, or lack of access for lower income people, digital inequality exacerbates existing inequalities and efforts should be made to reduce the impact digital technologies have on this inequality.

**Joseph Holt (39016153):**

The SCC141 module this term has focused on some of the biggest issues faced by the field of computing and society as technology advances, such as privacy, climate change and the digital divide. My main takeaway from these lectures has been that the computing industry is the industry with the most power to resolve these problems, and the development of new technologies must be done responsibly to avoid exacerbating these problems further. Before this term, I hadn’t realised how much power is in the hands of the people controlling the major computing companies compared to governments to control these issues. This has made me think about how it is the responsibility of the companies behind emerging technologies to make sure that they are used responsibly and are accessible to as many people as possible. The lecture about the digital divide highlighted how the focus is always on making new high end devices and there is very little focus on making technology more affordable and reducing the digital divide, which is where more effort should be going in my opinion. I could end up using this information when designing new software or devices in the workplace, by designing them to be as efficient as possible to reduce the environmental impacts, making them affordable to reduce the digital divide, and trying to prevent misuse of the new and emerging technologies and the threats that come with them.

**Dylan Mynard (38962284):**

Mainly, my takeaway from this term was the extent of the issues within computing, and how despite incessant issues, computing can also be used for the good of everyone as a world. Specifically, the effect of computing and its constant innovation in the climate crisis. On the one hand, the ever-growing carbon footprint of AI compute and cryptocurrencies due to high energy usage, and the need for more and more data centres as the cloud expands to fill the ever-increasing belief that storing things digitally is less harmful than storing things physically, which is having a massive effect on the climate. However on the other hand, some of the compute of these data centres could be devoted to finding new ways to solve the climate crisis, such as crunching numbers to improve the performance and efficiency of clean running nuclear fusion reactors as a way to get away from the masses of carbon created through producing energy from gas or coal, or working out ways in which to reduce the emissions of some of the most polluting industries, such as energy creation. The duality of this really interested me, and prompted me to learn more, by looking into exactly what we know can be done to reduce the carbon footprint of both computing, and human life overall, and also seeing what help AI may provide in finding economic solutions to these problems, as often the reason change isn’t implemented is monetary. It also prompted me to spend time thinking about what I believe to be the best way forward.

**Robert Bujor (38926296):**

Throughout the SCC141 lectures and the seminars of this term, my understanding of the importance of privacy involved in developing technology and AI deepened significantly considering the articles and the problems that were shown to us in already existing services. Particularly enlightening were the lectures and discussions on the impact of algorithmic bias and the ethical implications of data collection practices. These topics helped me gain a new perspective of working fully towards getting the best quality for the consumers and taking into consideration more ethical issues, that I was not aware of, in today’s technological industry. I am looking forward to applying the newfound perspective when I will have the opportunity to say my word in the work-field and trying to prioritize transparency, accountability, and user consent in my possible future projects as a computer scientist.

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Appendix: We all worked equally, except for Mohammed Ali, who didn’t turn in paragraphs, hence the highlighted sentences denoting where his work should be. We each had a paragraph in each section. In the first section the paragraph order is: Mohammed, Dylan, Joseph, Scott, Robert. In the second section, the order is: Joseph, Scott, Mohammed, Robert, Dylan. In the third section, the order was: Dylan, Joseph, Robert, Mohammed, Scott. There were no lead authors.