1.Moral Machine: is an online platform, developed by Iyad Rahwan's Scalable Cooperation group at the Massachusetts Institute of Technology, that generates moral dilemmas and collects information on the decisions that people make between two destructive outcomes. The platform is the brain child of Iyad Rahwan and social psychologists Azim Shariff and Jean-François Bonnefon, who conceived of the idea ahead of the publication of their article about the ethics of self-driving cars.

2. **Virtue ethics**

2.1Virtue ethics: are normative ethical theories which emphasize virtues of mind, character and sense of honesty. Virtue ethicists discuss the nature and definition of virtues and other related problems that focus on the consequences of action. These include how virtues are acquired, how they are applied in various real life contexts, and whether they are rooted in a universal human nature or in a plurality of cultures.

2.2virtue ethics is 1 of the 3 categories of normative ethics. Virtue ethics propose that people are driven by their virtues in how they think and act. This drives their moral compass and how they face ethical challenges. Virtue ethics is not about the action taken in a moral dilemma. Instead it is about the character traits of a person. It poses the question do you want to be someone who does an action, instead of being faced with should I being doing this action.

2.3  A strategy for defining normative ethics which states that if a person developed the right character traits then he/she will automatically act ethically. This strategy focuses on character traits.

2.4 Virtue ethics is the idea that if one possesses good character traits then he or she will most likely behave in an ethical manner. The question we need to ask ourselves is what are the good character traits that cause people to conduct themselves in an ethical manner. We saw that these traits varied depending on who was arguing them. For example, Aristotle, Plato, and Medieval Christians all defined good character traits differently.

**3.Technological determinism**

3.1 Technological determinism is a theory that describes how a societies cultural vales and socials are influenced by the contemporary technology which they use. This means everything that we consume, interact with and share will be influenced by influenced by it.  Social and political changes are driven by the technologies that surround them.

3.2 Technology determines how our society is shaped or developed. Hard technological determinism believes that the change of our society is driven primarily by technology, while soft technological determinism states that technology is an important but not primary agent of our social change.  
3.3 This term states that technologies are an important source that determines the development of social and cultural value for society. This term explains that usually, the ones that have control over the technologies are the ones that have more superior power. It tries to explain the causation relationship between human's actions and the technology they have in control.

3.4 technology determines the course of societal development. There are two different subtypes of technological determinism. Hard technological determinists believe that technology is the main force for social development. On the contrary, soft technological determinism believes that technology is only one of the factors affecting social development.

3.5 Technological determinism is a theory that argues that technology determines the course of societal development.

In other words, technological determinists believe that technologies have the power to determine how society changes.

Hard technological determinism states technological development as the primary agent of social change. Soft technological consider

technological development is one important agent to make social change, but not necessarily the primary fact.

3.6Technological Determinism is a theory that was proposed to show that technology significantly affects society and its development. Moreover, new technological breakthroughs cause society to change and adapt to these technologies. Within technological determinism there are two subtypes. Hard technological determinism argues that technological development is the main driver behind societal changes. Secondly, soft technological determinism asserts that the development of technologies are only one of the many reasons behind how and why societies change. Examples of such technologies can be self-driving cars, the Hyperloop, augmented reality, and many more.

3.7 Technological Determinism is a theory that describes the relationship between technology and society. It assumes that technology is the driving force that makes the society change. Hard Determinism illustrates that technological progress will inevitably produce specific results in human society, and is the only and most important factor that determines social development. Soft Determinism means technology is the primary guiding force that shapes society; However, people can still make decisions depends on circumstances.

3.8 The term means the technology determines the development of society in some ways. It originates from an American social scientist and later suggested by Karl Marx, a German philosopher. This determinism fundamentally explains the connection between technology and society's nature. Just like other tools in our lives, technology shapes society and society also shapes technology. For example, just like the invention of guns or nuclear power, these tools could be used to bring benefits to human beings or to kill people. Users have the right to decide how to use technology.

**4.Algorithmic Morality**

4.1 It describes how ethics can the program be like a self-driving car. We should implement an algorithm that can morally make the decision. Under a specific situation, how the program is going to react for a safer result.

4.2 This is the idea where an algorithm has to take a decision where morality is involved. The most common example is the self-driving car deciding to kill its passenger or to hit pedestrians instead. Computer code on its own is designed to perform linearly, so the actual decision is actually chosen by its programmer. The choice can be controversial because it is based on morality and every individual can have different point of view of what is moral. It is not possible to have everyone`s opinion as a computer code.

4.3 An algorithm that is designed to behave in an ethical manner. Certain softwares are programmed to make ethical choices, an artificial intelligent system that is capable to become more intelligent than a human being may also be able to recursively create an intellectual superior system.

4.4 The topic of algorithmic morality tries to explain the questions of morality that arise as we let algorithms perform more and more functions throughout our daily lives. Since algorithms are simply made up of computer code, they do not have any inherent morality themselves. Any moral reasoning must then implemented by the programmer, which is difficult. Sometimes, we simply can't explain how we make decisions based on our moral compasses, we just *feel* one way or the other. How then, can we possibly express those feelings in code?

4.5 it is an algorithm which designed to have ethical behavior in specific cases. In the article of Nassim JafariNaimi, it was about self-driving cars and how we can design a program of sequence of actions the car can take to solve some situations to have the best moral results related to peoples’ safety.

4.6 The term refers to an algorithm of technology that corresponds to some ethical and neutral principles in society. The technologies sometimes are forced to face some ethical situations like trolley problems. According to JafariNaimi (2018), self-driving cars are a typical example of algorithmic morality. In real life, technologies are frequently involved with ethical judgments, such as either killing the pedestrians or the driver. The software engineers have to take responsibility for the algorithms they designed. Therefore, these moral choices require refined the process of software engineering.

4.7 Algorithms are simply codes written by the programmer. Algorithmic morality entails solving the ethical issue that arise from designing such codes. In the case of JafariNami, Self driving cars pose ethical questions that cannot be resolved by the algorithm. It must be implemented by the programmers in order to attain the correct ethical choice were the life of people be at stake. Morality must be decided and implemented as the increasing amount of automation brings countless benefits but does not render justice to the lives it could possibly hurt. Finding ethical solutions to ethical dilemmas is a topic that must be reflected upon when creating automation.

**5.Tacit Knowledge**

5.1Tacit knowledge is the kind of knowledge that not learned from a book or other person; it's from the experience from work or a daily basis. This part of knowledge can not transfer to another person or taught by others.

5.2 Tacit knowledge is an experience that we gather from our personal endeavors, both positive and negative throughout our lives. This type of knowledge is very difficult to be explained or taught and has to be learned by each person themselves. Tacit knowledge is mostly related to work experience, and the difference between the theory that can be taught anywhere in the world, and hands-on knowledge that simply needs to be experienced by the learning party to completely understand what it means.

5.3  **Tacit Knowledge**is a form of knowledge that is hard to describe though the use of language and therefore difficult to transfer between individuals. Tacit knowledge is a posteriori, which means it is gained primarily through our personal experiences (eg. driving stick shift, riding a bike...etc.).

**5.4**

Knowledge can be divided into explicit Knowledge, implicit Knowledge, and tacit knowledge. Tacit knowledge can be defined as the knowledge that gains from personal experience, it includes informal skills, techniques, work experience, secrets of success and tricks, etc. Compare to explicit knowledge, tacit knowledge can not express clearly through language, words, charts, or symbols, and it is generally difficult to transmit clearly and logically.

5.5 Knowledge which is not transmitted formally by way of teaching. Tacit Knowledge is knowledge that is learned through work and experience, and cannot be transmitted easily to another person, as it is embedded in the domain of knowledge. In other words, tacit knowledge is knowledge of a certain part of a domain which is not and cannot be taught, it is learned through experience.

5.6 - Tacit knowledge is the set of non-verbalized, somewhat informal knowledge one has, or or may have without being aware. It is knowledge that is difficult to pass-on through typical means of information sharing, such as verbal or written exchanges. It is distinct from explicit knowledge in the sense that it is difficult to pin-point where or when we have learned; it is instead typically by constant doing that we learn such knowledge. The instinctive knowledge of how to open a door, use a smartphone touchscreen or how to ice-skate well are examples of such tacit knowledge.

5.7

There are three subdivisions for knowledge, these being: explicit, implicit and tacit knowledge. Tacit knowledge is one that cannot be expressed easily to other people through various means (words, graphs, pictures, etc..) nor logical reasoning. Tacit knowledge is knowledge that one accrues from experience, whether being personal, work-related, technical, personal revelations and is only learned through subjective experience. In essence, Tacit knowledge cannot be shared or taught, unlike explicit knowledge.

6 Duty Ethics:

6.1 Duty ethics are based off of the action that someone takes in a certain situation, rather than the outcome of those actions. Duty ethics are concerned with acting upon something with good intent and meaning to do the right thing, rather than what actually happens.

6.2 Duty Ethics: A form of normative ethics that posits that our behavior should be guided by a set of moral principles. This implies that an action is considered ethical if it is consistent with these moral principles.

For example, if a person believes that harming sentient animals is wrong, that person should not eat meat since it implies harming such animals.

6.3 Another strategy for defining normative ethics which states that good characters do not decide right or wrong, the actions themselves are important.  This strategy focuses on the actions rather than the result.

**7.Networked Publics**

Danah Boyd describes networked publics as a social space that is created through networked technologies and networked people. These forms of communications allow us to connect with each other in multitudes of ways, such as social media platforms, and create or join a social world. She also mentions that networked publics enables us to have more political power.

8.**Technological Momentum**

8.1 A movement in which certain technologies slowly becomes a core part of our daily lives. It takes control of how we would normally act and can be so essential that it removes some of our freedom of choices. A phone for example is a technology that is required to communicate with a very distant person, which otherwise would be extremely difficult to reach that person by walking on foot.

8.2

Society and technology are both influential. New technologies can gain momentum, and may influence other technologies. This can be due to financial, ideological or other reasons. Also once a system is in place, it's much easier to keep it going than to start another system.

**9 Uncanny Valley**

9.1 A concept that defines a link between the human resemblance of an entity and the emotional response we have when faced to it. There is a point where if an entity is very close to resembling a human but not perfectly so, the emotional response to it actually gets more negative, giving a creepy or uneasy feeling to it.

9.2 Concept involving our relation with ICT's, whereas a visual representation of the human appearance is seen as human-like up to a certain point. At that point, ICT's are in the uncanny valley as they are perceived as human-like in appearance, but not enough to look natural. It is a divide between an ICT that looks and acts like a human, therefore not seeming weird, and an ICT that looks like a human, only *slightly* off, which makes us perceive ICT's as machines, not humans.

**10 Logical malleability:**

10.1 When an entity can be constructed and modified according to various inputs, outputs and/or logical operations, it is deemed as logically malleable. According to Moor, computers are revolutionary because of their logical malleability, since we can transform computers to fit any role or do any tasks we need it to do.

10.2 Something can be built, altered and act according to a series of inputs, outputs and logical operations. A computer is logically malleable since every step of its operation is strictly defined and precisely executed with certain logic.

10.3 Logical malleability is what makes computers revolutionary. It means that they can be manipulated to do any activity that can be shaped in terms of input, output and logic operations between the input and output.

**11 Privacy**  
is a state in which one is not observed or disturbed by other people.

**12 Big data**

Big data refers to a large, diverse sets of information that grow at ever-increasing rates. It encompasses the volume of information, the velocity or speed at which it is created and collected, and the variety or scope of the data points being covered

12 Consequentialist Ethics:

12.1 Another approach to define normative ethics besides virtue ethics and ontology is consequentialist ethics. This idea is about focusing on the consequences of our actions opposed to looking at the actions themselves. Utilitarianism is the most famous example of the consequentialist ethics which says an action is right if the consequences of that action are more favorable than unfavorable, for everyone.

12.2 Consequentialist Ethics: Another form of normative ethics that states that our behavior should be guided by its consequences. Its most common variation is utilitarianism which says that these consequences can be evaluated by computing the sum of its consequence on everyone.

Using the same example, a utilitarianist could argue that eating meat is acceptable if the killed animals do not suffer much and the meat provides considerable joy to many people. In other worlds, if the utility calculation turns out positive.

 13

Sentience: One of the well-known conditions for determining if something has moral status is sentience. As Nick Bostrom and Eliezer Yudkowsky define in their article it is the capacity for phenomenal experience or qualia, such as the capacity to feel pain and suffer. In other words, it is the ability to feel, no matter negative or positive feelings.

**14 MORAL AGENCY**

Traditional deontological and utilitarian ethics have always placed a strong focus on the moral responsibility of the individual, often referred as moral agency (Zwitter 2014). Moral agency has be en traditionally determined by three commonly agreed upon conditions: causality, knowledge, and choice (Zwitter 2014). These are described in the following (Zwitter 2014, 2).

1. Causality: An agent can be held responsible if the ethically relevant result is an outcome of its actions.
2. Knowledge: An agent can be blamed for the result of its actions if it had (or should have had) knowledge of the consequences of its actions.
3. Choice: An agent can be blamed for the result if it had the liberty to choose an alternative without greater harm for itself.

14.2

 - Moral agency is the moral state of a person that may be held accountable as a moral agent. To Zwitter, 3 elements are necessary to determine one's moral agency: causality (the outcomes are the result of the action), knowledge (the moral agent knows, or under reasonable expectations should have known the consequences of the action), and choice (the moral agent chose this action among other plausible actions). Hence, overall a moral agent has moral agency if he has *a priori*knowledge of the consequences of his actions. This concept is central to moral and criminal accountability, and it is embodied in the law as *mens rea -*theguilty mind- in order to establish responsibility.

**15 THE TROLLEY PROBLEM**

The trolley problem is an often used thought experiment that illustrates the deontological versus utilitarian perspectives when faced with an ethical dilemma and moral agency. A bystander is faced with a situation where an incoming trolley is about to endanger many persons tied down to the track where a lever is present and offers the opportunity to divert the train in order to only endanger one person instead. In this simplistic scenario, the condition of knowledge for moral agency is clear: if the person chooses to pull the lever, the train is diverted and prevents endangering the many and instead only endangers the one. For the utilitarian, the option to pull the lever and sacrifice the one to save the many justifies the means. However, from a deontological perspective, this ethical calculus is irrelevant and the moral action to take would need instead align with their own chosen set of moral duties. For example, if their moral obligation is taken as 'to not harm any individual', then the moral action for this bystander would to not pull the lever at all since doing so would go against their duty to not harm anyone. The fact that the lack of action itself endangers more people was never the deontological bystander's direct doing, hence doing nothing would not conflict with their moral duty.

16 **Social Determinism**

16.1 This term goes against Technological Determinism, it states that the technologies we develop bases on the social norms and values of the society. It also presents a causation relationship, but the relationship is reversed. The economic status, social structure, cultures are considered the key elements that shape the technology development of the society.

16.2 Social determinism is often used to oppose technological determinism. It is a theory proposing that the technologies we develop and use are shaped by our social constructs and interactions, rather than by some unstoppable force of technological momentum. For example, the delayed popularity of firearms in Japan marks the triumph of culture (samurai mentality) over technological momentum (firearms are better weapons than katanas). However, social determinism does not reject the possibility of technology-induced social constructs. Indeed, Langdon Winner, a pro-social determinism writer, argues that artifacts can have politics.

16.3

It's a type of soft determinism that in contrast to hard determinism. When a technology is widely used especially in a are built around certain technology, it is hard for people to make great change again. Technology doesn't control people all the time, in the first place there are a lot of choices. However, it is still technology determinism because when we build system for it. It becomes deterministic and control over society.

17 **Privacy protection**

Traditional personal privacy includes data such as name, date of birth, ID number, marriage, family, education, medical history, occupation, financial situation, etc. Modern personal data also includes email addresses, personal domain names, IP addresses, mobile phone numbers, and Information such as user name and password required to log in on each website. With the popularity of computer information management systems, more and more computer practitioners have access to a variety of confidential data. These data are not only limited to personal information, but also business data of enterprises or unit users. They are also the objects to be protected. People are generally worried about whether personal privacy can be respected. Privacy issues mainly concern who has the right, under what conditions, in what way, what personal information can be collected and obtained, etc.

18 **Professional Ethics and Industry Code of Conduct**

      With the increasing dependence of the entire society on computer technology, the losses and waste caused by computer system failures and software quality problems are staggering. Computer professionals live on computers or providing information. They are professionally trained to provide professional services to those who do not have computer-related knowledge. Therefore, the exchange of interests between computer professionals and other members of society is based on knowledge inequality. If there is no ethical professional attitude, this relationship will be unstable. In the computer industry, how to improve and ensure the reliability of computer systems and computer software has always been the research topic of researchers, and it is necessary to establish an objective means or safeguard. And how to reduce the problems caused by the subjectivity of computer practitioners (such as negligence) requires the self-supervision and restraint of the practitioners.

19 Political Technologies

19.1Political technology is a concept that a piece of technology can obtain political qualities in one of two ways, it may be intentionally or unintentionally political otherwise it is inherently political. A technology created with malicious intent is known to be intentionally political, a good example of this is the height design of the underpass onto long island. This bridge was designed to discourage the presence of buses on the island, and the consequence to this is that racial minorities who took public transportation would not be able to enter the public park. A technology that requires a hierarchal social system to operate is known to be inherently political. A ship cannot be operated democratically, their operation requires a captain to coordinate many individual workers in a social hierarchal manner.

19.2 The effect of technology in shaping the society is explained by this term. A technology can be inherently political meaning that some kinds of political structure comes along with this technology. Contrary, politics can be introduced by the designer of the technology intentionally. It relates the changes in the society with the advancements in technology

20**Social Construction of Technology**

20.1 Social construction of technology is a concept that attempts to explain the progression of technology in society throughout history. It states that it is human and societal factors that determine the growth and progression of technology. This theory is in direct opposition to the idea of technological determinism, which states that technology itself is the main drive of societal change, more so than political, economic and other factors. An example of this is the fact that high speed rail systems have been developed across Europe, while no such rail system exists in Canada or the U.S. Although the technology to implement such a technology exists, politics and business interests in North America have restricted its development.

 20.2 Social Construction of technology:

As opposed to technological determinism, it is a theory which suggests that people have more control over how new technologies are developed. People's needs and wants are what drives innovations. When social norms change, technologies have to adapt to that. An example of this is the development of the bicycle, going from the penny-farthing design to the modern bicycle due to the increased interest from different social groups who couldn't ride the penny farthing.

20.3

Social Construction of Technology is a theory that opposed to technology determinism. The theory tries to demonstrate not that technology controls human lives, but that people, especially groups of people have ultimate control over how technologies develop. The technologies are just artifacts that reflect people's wants and needs and desires. this is a theory that's been widely used when people are talking about the historical development of a specific technology.

21 Computer Ethics

21.1the basic behaviour standards that computing professionals should follow regarding professional and social conduct. Computer crime, privacy, anonymity, freedom, and intellectual property are the main issue related to computer ethics.

21.2are common ethical rules that are followed internationally. These set of rules were put to regulate the use of technology by users or programmers in a way that does not hurt anyone uses them and that way people can trust these technologies and use them safely.

21.3 Computer ethics are a set of moral standards that govern the use of computers.  It is society’s views about the use of computers, both hardware and software.  Privacy concerns, intellectual property rights and effects on society are some of the common issues of computer ethics.

22 Co-production

A more modern theory that comes between the social constructionist, and the technological determinist. it suggests that technology and society co-evolve and will continue like so. In other words, technology has agency over society while society has agency over technology.

23 **Deontological Ethics:**

Deontological ethics is a subgroup of normative ethics. It is often used to oppose consequentialist ethics. Deontological ethics use a moral norm to determine whether an action is morally justified, contrary to consequentialist ethics, where the consequences of an action are used to justify its morality. One example to illustrate the difference between deontological and consequentialist ethics is the trolley problem, where one man has to decide whether a trolley kills 5 men or 1 man by switching its track. A utilitarian/consequentialist approach would be to switch the trolley's track to kill 1 man instead of 5 men. However, such action of intentional killing would be deemed immoral according to deontological ethics.

24 Ethics

“The field of ethics (or moral philosophy) involves systematizing, defending, and recommending concepts of right and wrong. Philosophers today usually divide ethical theories into three general subject areas: metaethics, normative ethics, and applied ethics.”

Metaethics asks where our ethical principles come from, and what their meaning is.

Normative ethics seeks to define right and wrong conduct.

Applied ethics examines specific controversial issues, e.g. capital punishment, animal rights, gun control.

25 **Normative Ethics** is a form of metaethics which attempts to create a framework to understand what is morally acceptable / unacceptable. Normative ethics has broken into multiple categories such as virtue ethics (character), deontology (actions), or consequentialism (consequences).

26**Social construct:**

Social constructs are not defined by purely objective terms but by social judgement. Indeed, society decides what is deemed valuable and what is unimportant. In the case of Computer Science, **skills**could be considered a social construct as there are no objective skills but instead various characteristics that can define programming as high or low status, abstract or concrete, creative or monotone. Moreover, another example of social construction comes in the form of **identities**such as biased perceptions of what programmers typically look like as well as what defines them.

27 **Ethics of Care:**

Ethics of care is a form of virtue ethics which prioritizes empathy and compassion. In fact, it argues that:

-        People are **interrelated**and **dependent**on one another, therefore they never truly act alone as ethical agents.

-        Unlike Utilitarianism which only takes into consideration the consequential outcomes that produce the “greatest good”. Ethics of care argues that **particular consideration** should be given to vulnerable individuals when considering the consequences.

-        Situational **details**and **immediate contexts**such as experiences and values are important aspects to consider when making ethical decisions. Thus, ethical vacuums are inaccurate and irrelevant.

28 **Technological Lock-In:** Technology that depends on its path of development.  A system becomes the standard and thus locked in. The following are 4 main reason why a technology may become locked in.  
The first being is when a technology is already being mass produced, the production costs are low and the system is already readily available.  
Another reason is the learning effect. The idea that previous technology already has all the research and knowledge surrounding it, and adopting or using this technology lowers new research costs.  
Adaptive Exceptions is when a technology is already known and trusted. The consumer and producer become confident about quality, performance and longevity for the technology. People are less willing to change what they already know.  
Network economies, the idea that it's better for someone to have technology that is compatible or works with other peoples technology. Adapting the same or similar technology will be preferred.

**29Identity crisis**

As the computer center is defined as a homosocial environment, more and more male programmers have an unsuccessful relationship with women. Base on this situation, more females are excluded from the computer environment. Therefore, women have a low participation rate on the academic computer science and academically-oriented professional societies

**30Academic computer center**

The academic computer center has three unique features. Firstly, the academic computer center is independent and isolated. The developer has high authority to access equipment because of unsupervised environments. Secondly, the academic computer center provides economic help. the company needs to modify the computer time effectively because coding means a high salary. Lastly, the academic computer center didn’t take education purposes. In other words, it has less connection with academic studies.

**A Summary of Dana Boyd's Chapter, "searching for a public of their own"**

In the eighth chapter of her book, *It's Complicated: The Social Lives of Networked Teens,*Dana Boyd summarizes many of her main points. Her goal is to educate any who might misunderstand the online lives of teenagers. Boyd has collected years of anthropological research by conducting interviews with these teens about their usage of social media. She argues that teens' restrictions force them to turn to networked publics, that these networked publics create new ideas of publicness, and that humans influence how these spaces are used.

She first argues that teens use online tools to establish their own public spaces and to establish the norms of these spaces. The teens, she says, are not trying to escape their realities, but, instead, are extending their realities, online. Teens are excited at the opportunity to " find ways to access and participate in a whole host of publics, from social publics to political ones." They are habitually restricted from accessing many real-life publics by their parents or school, so they turn to networked means of participation.

The adoption of an online public lifestyle gives these teens access to a host of new social possibilities. Boyd is careful to highlight each of them: to be in public, to be public, and being digital flaneurs. Teens who want to be public, are mainly interested in being seen in these online spaces and communicating their thoughts to a broader public. Alternatively, those who want to be in public, are simply seeking to see and be seen "they are, in effect, digital flâneurs". She emphasizes the fact that these roles are an effective lens through which to view teens' online public roles.

The next point she makes is that humans define the usage of online spaces. She defends this social constructivist argument by providing an example of a teen who chooses to use different social medias for different posts. She explains that this teen chooses his platform based on the social norms that govern it. “In this way, the technical architecture of the system matters less than how users understand their relationship to it and how the public perceives any particular site”. Essentially, this teen's usage of online spaces has been entirely determined by the social norms that humans have created.

Finally, Boyd acknowledges the political effects that these online spaces can have, and she defends teens that have previously started political movements online, only to be thwarted by naysayers. She explains that although such political movements are often disregarded because they take place online, they should not continue to be overlooked. Just as teens' online lifestyles and opinions should not continue to be overlooked.

**Summary of "Is Computer Science Science?"**

In the article "Is Computer Science Science", Denning argues that computer science meets every criterion to be defined as a science, but it has a self-inflicted credibility problem. He declares that computer science is a combination of science, engineering, and mathematics. He refutes the argument that computer science is not a science because it studies man-made objects. Computer science studies information processes, which occur in the world naturally. Information processes are both artificial and natural. Computer science contributes to many other fields study theirs and is contantly forming relationships with other fields. On the other hand, Denning claims that a big issue of computer science is a credibility problem. It decribes too much wonderful future but many of the claims cannot come true.

Summary of code 2.0

Lawrence Lessig *Code 2.0* is an update to his original book *Code and Other Laws of Cyberspace*. The excerpt we received for the class showed us different scenarios to illustrate certain ideas. For the most part, these were about regulation and laws on the internet. How can we regulate an entity like the internet. From the part we had about the four puzzles, which are essentially stories, he demonstrates the nuances and the complications in regulating a virtual space that is different than what we are used to in 'real life'. Personally, I find he also touches certain points that contrast between the real and the virtual. In one of the stories, he mentions the game Second Life and the amount of time people spend in a virtual world. They could spend this time potentially doing the same things in real life but they instead spend it in a virtual one. In another, we are told of a person with a hidden online personality - one that may be considered far more deviant and potentially dangerous than the shy person in his daily life.

While the main ideas are about regulations and how our current system may be unable to deal with it or must find novel ways to do so, there are interesting ideas of ethics that transpire from the text.

**Summary of seeking perfect programmer**

*Seeking the Perfect Programmer* by Janet Abbate is a text studying the challenges that faced women seeking employment as programmers during the 1960s and 1970s. The reading also discusses the difficulties of employers in defining the attributes they were searching for and what their resulting decisions meant for female job candidates.

Abbate analyzes the business, engineering and mathematic perspectives from which employers viewed programming and that influenced the qualities they determined essential for the job. For example, the engineering perspective insinuated that a programmer should have knowledge of computer machinery, while a business perspective wanted managerial skills as well as programming talent, so that the programmers could be promoted later on and given more responsibility. Abbate discusses how employers also looked at education, experience and aptitude tests to determine how women faired on each of these qualifiers. She determines that a mathematical or engineering degree and/or work experience would practically guarantee a woman a job as a programmer assuming she could get access to these prerequisites. Aptitude tests also gave a more equal opportunity to female candidates. Nonetheless, though different perspectives and qualifications gave women varying degrees of opportunity, they still faced explicit discrimination when applying to programming jobs due to the belief that women were only suitable for the more manual ‘coder’ work, therefore, the logistical planning/managerial programming jobs were often out of reach for women.

**Big data ethics summary**

According to Andrej Zwitter in his article “Big Data Ethics”, the essay goal is to discuss how certain principles of our philosophy and ethics might be changing and require rethinking due to the emerge of technology and big data.  First, he discussed our traditional Ethics and their three conditions (causality knowledge and choice), then he spoke about the four qualities of big data:

1.  Nowadays, there is more data than ever in the history of data

2. Big Data is Organic, and it comes with messiness

3. Big Data is Global

4. Analysis of big data highlight correlation over causation

New power distribution means that ethicists always try to keep up with modern day issues, so they can keep ethics up to date.

Some ethical big data challenges:

1. privacy; because our lives are always recorded, our past and future become almost completely transparent for the people who control the data.

2. group privacy; even though the group data is being anonymous, the groups are always becoming visible

**Summary： What is Computer Ethics**

Before the 1980s, people did not really link the use of computers or technology derived from computer science with the field of ethics. In his article entitled "What is Computer Ethics?", James Moore argues for an extension of the field of ethics into the realm of computer technology which he appropriately calls "Computer Ethics". Moor argues for the creation of computer ethics and he has three main arguments that support his claim which he refers to as policy vacuums, logical malleability, and the invisibility factor.

Policy vacuums is the term in which Moor uses to describe holes in our current (1980) ethical policies specifically regarding the use of computer technology. He explains that these vacuums may seem pretty clear initially but if you give them a bit of thought "conceptual muddles" begin to arise. He uses an example of a computer program to illustrate this point and poses the question of whether the program should be protected by copyright or patent which all depends on whether we think of the program as an expression of an idea (copyright) or a process (patent). These questions require a conceptualization of a computer program in order to choose the appropriate policy to protect the computer program.

Moor also states that computers are "logically malleable" by which he means that computers are very powerful tools whose logic can be used, shaped or programmed to do just about anything. Because of this, computers provide us with new capabilities and these in turn give us new choices for action. Many of these choices often lead to things that either lack or simply do not have any ethical policies set in place to help regulate our actions and this is where computer ethics would play another role in determining what to do in these situations.

Lastly, and probably my favorite, the invisibility factor. Moor states that due to the nature in which computers hide their logical complexity (in the code), there can be things that go unseen to the general population. This opens the door for a form of malicious abuse of it's users. He uses an example of a programmer who realized he could steal excess interest from a bank by forwarding the result of a rounding errors (a fraction of a penny) into his own personal bank account. He also shows a few other examples that involve hackers and invading people's privacy and possibly spying on government secrets. Needless to say, there are many possible examples and I think that this is one of his strongest arguments.

Moor defines and portrays this new field of computer ethics as one that will aid us in dealing with the ethical dilemmas that arise from the aforementioned issues that come from the use of computer technology.

**Summary: why computer ethics are different than other type of ehics**

James More tried to tell us why computer ethics need to be thought of differently than other types of ethics. It is important, because for him, computer technology is revolutionary. It is revolutionary because they have operations that are invisible and classified into three categories. First category is the invisible abuse, where one uses computer to commit crimes because they are harder to trace. Next category is the invisible programmer values, where one doesn’t know how nor based on what values the code was built. The last category is the complexity of computer operations.  In other words, the operations behind a code are so complex that it is impossible to follow every step and end up just having to trust the people that have built the code.

Summary:   
**danah boyd-It's complicated the social lives of networked teens**

In this ariticle danah boyd focused on how young teenagers used the ICTs to search for a public of their own. She argued that "Teens found social media appealing because it allows them to access to their friends and provides an opportunity to be a part of broader public world while still situated physically in their bedrooms(p.201)" She said that they are not running away from reality, but actively taking part in their public life.

She found that "What makes a particular site of service more or less public is not necessarily about the design of the system but rather how it is situated within the broader social system(p.204-205)".Her example was a boy using Facebook to post more public information while he use Twitter for more intimate thoughts.

she said that "the nature of public-ness is actually being remade every day in people's lives (p.205)", and teens have various understandings on what their want from public and how they understand public, but "teens who want to be public often use media or new technologies to do so(p.205)".

she also talked about how teens get involved in political movements through social media. She noticed that adults usually are against such actions."Overwhelmingly,public leaders and journalists deem many actions that teens and young adults take in the name of protest as illegitimate(p.209)". She argued "many teens have used the tools of internet culture to express themselves politically(p.210)",although not all teens are politically engaged, boyd said adults should pay more attention on them as they try to express themselves in public.

In the end of this chapter boyd showed an optimistic view on  teenagers' use of ICTs and encouraged adults to also join and assist them. "Rather than resisting technology or fearing what might happen if youth embrace social media, adults should help youth develop the skills and perspective to productively navigate the complications brought about by living in networked publics. Collaborately, adults and youth can help create a networked world that we all want to live in(p.213)".

**A Summary of "Do Artifacts Have Politics?" by Langdon Winner**

The article discusses the relationship between technology[1] and politics[2]. Langdon Winner seeks to undermine the idea that technologies are neutral. Instead, he argues that there are two ways technologies can have a political facet.

The first category consists of technologies that can either be intentionally or unintentionally designed to enforce a societal power relation. He enumerates some examples of this category. Such as the story of Robert Moses who built overpasses on Long Island parkways that were so short that they prevented the passage of public buses. These bridges were specifically designed to have a social effect – exclude poorer citizens and minorities from reaching some neighborhoods in New York City. Another example is the industrialist McCormick using molding machines, despite them being more expensive short-term, to undercut skilled workers and destroy unions. The last example details the usage of tomato harvesters by farms in California at the expense of rural agricultural communities (who lost 32,000 jobs) but to the benefit of large growers.

The second category encompasses “inherently political” technologies. That is, certain technical systems unavoidably lead to specific systems. As Langdon predicts it, some technologies such as nuclear power will undoubtedly lead to authoritarian state power as they have unchanging repressive, authoritarian and inegalitarian qualities. While other technologies, such as solar power, will always lead to democratization due to their innate liberating, decentralized and egalitarian tendencies.