

ICE BREAKER

If you could come up with one ethical law for computer programmers, what would that law be?

By the end of the lesson you should be able to:

- Discuss Importance of Ethics in Computing
- Discuss foundational principles of ethics and professionalism in computing
- Discuss real world examples of ethical dilemmas in computing

What is Ethics?

A set of moral principles that govern the behavior of a group of individual.

What is computer Ethics?

Computer Ethics is a part of practical philosophy (viewpoint/idea) concerned with how computing professionals should make decisions regarding professional and social conduct.

Unethical behavior in Computing

1. **Data Breach and Unauthorized Access:** An employee of a large tech company gains unauthorized access to sensitive customer data and sells it to a competitor. This results in a massive data breach, compromising the personal information of thousands of users.
2. **Software Piracy:** A software developer creates a popular application and decides to distribute unauthorized copies of the software for free or for a lower price, violating copyright laws and undermining the legitimate sales of the software.
3. **Algorithmic Bias:** A machine learning engineer develops an algorithm for a job recruitment platform. The algorithm unintentionally exhibits bias against certain demographic groups, leading to discriminatory hiring practices that disadvantage candidates from those groups.
4. **Social Media Manipulation:** A social media company employs tactics to manipulate user behavior, such as designing addictive features to keep users engaged for longer periods, exploiting psychological vulnerabilities, and spreading misinformation for financial gain.
5. **Insider Trading with Technology:** An employee working in a financial institution uses privileged information gained through their role to engage in insider trading. They leverage advanced algorithms and high-frequency trading strategies to exploit market information before it becomes public.

6. **Ransomware Attack:** A group of hackers deploys ransomware to infect a hospital's computer systems, encrypting patient records and demanding a large ransom for their release. This jeopardizes patient care and puts sensitive medical information at risk.
7. **Facial Recognition Misuse:** A company develops a facial recognition system without proper safeguards. The technology is then sold to law enforcement agencies and is used for mass surveillance, violating individuals' privacy rights and potentially leading to wrongful identifications.
8. **Environmental Impact of Cryptocurrency Mining:** Cryptocurrency miners consume an enormous amount of energy to validate transactions. Miners, driven by profit, disregard the environmental impact of their operations, contributing to a significant carbon footprint.
9. **Exploitative Ad Targeting:** An advertising company exploits personal data obtained without clear user consent to create highly targeted and manipulative ads. The ads are designed to exploit vulnerabilities and influence individuals in ways that may be harmful or unethical.

Importance of Ethics in computing

1. **User Trust and Confidence:** Trust is fundamental in technology adoption. Users need to trust that the systems and applications they use are designed and implemented ethically to safeguard their data and privacy.
Ethical practices contribute to the development of reliable and secure systems, fostering user confidence in technological solutions.

- 2. Data Privacy and Security:** Computing often involves the collection, storage, and processing of vast amounts of personal and sensitive data. Ethical considerations are crucial in ensuring the privacy and security of this information.

Adhering to ethical principles helps in establishing robust security measures and safeguards against unauthorized access, data breaches, and misuse of personal information.

- 3. Social Impact:** Technology has profound effects on society, influencing how people interact, work, and live. Ethical considerations help prevent the development and deployment of technologies that could lead to negative societal impacts.

Ethical computing practices take into account the potential consequences of technology on employment, equity, cultural diversity, and other social aspects.

- 4. Fairness and Inclusivity:** Ethical computing involves designing systems that are fair and inclusive. Algorithms and AI models should be free from biases that could lead to discrimination against certain individuals or groups.

Ensuring fairness and inclusivity in computing contributes to a more equitable and just society.

- 5. Professional Responsibility:** Computing professionals have a responsibility to society. Ethical behavior is a cornerstone of professional conduct, encompassing honesty, integrity, and accountability.

Adhering to ethical standards helps maintain the trustworthiness of the computing profession and contributes to the overall credibility of the industry.

- 6. Legal Compliance:** Ethical computing practices often align with legal requirements. Following ethical guidelines ensures that professionals comply with relevant laws and regulations, avoiding legal consequences and fostering a culture of legal responsibility.

7. **Long-Term Sustainability:** Ethical considerations extend to environmental sustainability. Computing professionals should be mindful of the environmental impact of technology, such as energy consumption and electronic waste generation. Integrating ethical practices in computing supports the development of sustainable technologies that minimize harm to the environment.
8. **Global Collaboration and Standards:** As technology transcends borders, ethical standards provide a common ground for global collaboration. Establishing universal ethical principles helps in creating a shared understanding of responsible technology development and use.

Foundational principles of Ethics and Professionalism in Computing.

Foundational principles of ethics and professionalism in computing form the basis for guiding ethical behavior and responsible practices in the field.

1. **Integrity:** Acting honestly and ethically, adhering to a strong moral code.
IT professionals should be truthful and transparent in their work, avoiding deception, fraud, or misrepresentation. “**Thou shall act with integrity**”
2. **Privacy:** Respecting individuals' rights to control their personal information.
Protecting user data, seeking explicit consent for data collection, and implementing robust security measures to safeguard privacy. “**Thou shall prioritize user privacy**”
3. **Confidentiality:** Safeguarding sensitive information and respecting confidentiality agreements.

IT professionals should not disclose private or confidential information without proper authorization, ensuring the confidentiality of user data. **Thou shall safeguard data integrity and security**

4. **Accountability:** Taking responsibility for one's actions and their consequences. Professionals should be accountable for the reliability and security of their work, acknowledging and rectifying mistakes promptly.” **Thou shall act accountably”**
5. **Professional Competence:** Striving to maintain and improve one's skills and knowledge.” **Thou shall uphold professional competence”**
Staying informed about technological advancements, participating in professional development, and ensuring that skills remain current.
6. **Fairness and Non-Discrimination:** Treating all individuals fairly and without prejudice. “**Thou shall strive for fairness and inclusivity”**
Avoiding biases in software and algorithms, ensuring equal opportunities and access for all users.
7. **Social Responsibility:** Recognizing the broader impact of technology on society and the environment.” **Thou shall embrace social responsibility”**
Considering the societal consequences of technology, promoting ethical and sustainable practices, and contributing positively to the community.
8. **Transparency:** Providing clear and open communication about processes and decisions. “**Thou shall be transparent”**
IT professionals should strive for transparency in their work, making code, algorithms, and decision-making processes understandable and accessible to relevant stakeholders.

9. **Continuous Learning:** Committing to ongoing education and staying informed about industry developments.

Embracing a mindset of continuous learning to adapt to evolving technologies and ethical considerations in the dynamic field of computing. "Thou shall foster collaboration and professionalism"

10. **Respect for Intellectual Property:** Respecting the rights of creators and owners of intellectual property.

Adhering to copyright laws, licensing agreements, and recognizing and protecting intellectual property rights in software development and other digital creations. "Thou shall respect intellectual property"

Ethical Dilemmas in computing

An ethical dilemma in computing **refers to a situation in which a computer professional or user faces conflicting moral principles or obligations.** These dilemmas arise when there's a need to make a decision, and different ethical considerations or values come into play, making it challenging to determine the most morally justifiable course of action. Ethical dilemmas in computing often involve complex issues related to privacy, security, fairness, accountability, and the potential impact of technology on individuals and society.

Ethical dilemmas in computing arise from various contexts, applications, practices, and impacts of technology on individuals, organizations, societies, cultures, economies, environments, and the world at large. Here are some real-world examples illustrating ethical dilemmas in computing:

1. Privacy vs. Security

Dilemma: Balancing the need for enhanced security measures, such as extensive surveillance or data monitoring, with the right to privacy. For instance, implementing a system that monitors employees' computer activities to prevent insider threats may conflict with their privacy rights.

2. Software Development and User Safety

Dilemma: Deciding whether to prioritize rapid software development and deployment, potentially compromising quality and security, or adopting a more meticulous approach that may delay delivery but ensures a safer and more reliable product.

3. Data Handling and Transparency:

Dilemma: Deciding how much information companies should disclose to users about the collection and use of their personal data. This includes issues related to consent, data sharing, and ensuring transparency in algorithms that process user information.

4. Artificial Intelligence and Employment:

Dilemma: Addressing the ethical implications of deploying AI and automation technologies that may lead to job displacement. Deciding how to balance the potential economic benefits with the social responsibility to support workers affected by technological changes.

5. Access to Information and Censorship:

Dilemma: Deciding whether to support or resist government requests for backdoor access to encrypted communication systems. This involves weighing the need for national security against the right to privacy and freedom of expression.

6. Open Source vs. Proprietary Software:

Dilemma: Choosing between developing software as open source, promoting collaboration and accessibility, or developing proprietary software for financial gain. This involves considering the balance between openness and individual or corporate interests.

7. Whistleblowing and Professional Loyalty:

Dilemma: Deciding whether to expose unethical practices within an organization, risking professional consequences, or remaining silent. This dilemma involves conflicting obligations to the employer and a broader sense of professional and social responsibility.

Case Scenarios on Ethical Dilemmas in Computing

Case Scenario: Cambridge Analytica Scandal: Facebook's data-sharing practices with Cambridge Analytica raised ethical concerns about user privacy, data exploitation, consent, transparency, trust, accountability, regulatory compliance, and corporate responsibility. The unauthorized access and misuse of millions of users' data for political profiling, targeting, and manipulation highlighted the challenges of data privacy, security, governance, and ethical conduct in digital ecosystems.

Instruction to learner: Watch the video on Cambridge Analytica Scandal

- **Title:** How Cambridge analytica exploited the Facebook data of millions
- **Video Link:** <https://youtu.be/mrnXv-g4yKU>
- **Source:** The New York Times
- **Time Taken:** 2:32

Discussion Questions

1. What were the ethical implications of Cambridge Analytica's actions?
2. Do you think Facebook platform contribute to data exploitation?
3. What impact did the Cambridge Analytica scandal have on individuals and society?
4. What measures could Facebook and other social media platforms have taken to prevent such data exploitation?
5. How can individuals protect their data and privacy in the wake of incidents like Cambridge Analytica?
6. What lessons can businesses, researchers, and policymakers learn from the Cambridge Analytica scandal?

1. Algorithmic Bias and Discrimination:

Algorithms, especially those used in artificial intelligence and machine learning, can unintentionally reflect and perpetuate societal biases. The dilemma here is how to develop algorithms that are fair and unbiased, considering historical and cultural prejudices. Addressing this dilemma requires careful consideration of training data, algorithm design, and ongoing monitoring to prevent and correct biased outcomes.

Instruction to learner: Watch the video on Facial recognition

Title: Amazon halts police use of facial recognition software for one year

- **Video Link:** <https://youtu.be/diEhG59Euwo>
- **Source:** CNBC Television
- **Time Taken:** 0:56

Self-Driving Car Dilemmas: The development, deployment, and regulation of autonomous vehicles raised ethical dilemmas about safety, liability, accountability, decision-making, moral choices, risk assessment, human-machine interactions, regulatory frameworks, societal acceptance, adoption, adaptation, governance, and legal implications. The ethical challenges and complexities of programming self-driving cars to make split-second decisions in life-and-death situations, such as accidents, collisions, emergencies, and unforeseen circumstances, highlighted the moral, ethical, and practical considerations of automated systems in real-world scenarios.

Instruction to learner: Watch the video on ethical dilemma of self-driving cars

Title: The ethical dilemma of self-driving cars

- **Video Link:** <https://youtu.be/ixloDYVfKA0>
- **Source:** TED-Ed
- **Time Taken:** 4.15

