PROFESSIONAL ETHICS AND RESPONSIBILITIES

CSE 312 – Legal, Social, and Ethical Issues in Information Systems

Stony Brook University

http://www3.cs.stonybrook.edu/~cse312

CH 9: PROFESSIONAL ETHICS AND RESPONSIBILITIES

9.1. WHAT IS "PROFESSIONAL ETHICS"?

- *Professional ethics* includes relationships with and responsibilities toward customers, clients, coworkers, employees, employers, others who use one's products and services, and others whom they affect

- A professional has a responsibility to act ethically.

- Lapses in ethics in many professional fields
  - A famed and respected researcher published falsified stem cell research and claimed accomplishments he had not achieved
  - A writer invented dramatic events in what he promoted as a factual memoir of his experiences

- Many professions have a code of ethics that professionals are expected to abide by
  - Medical doctors must decide how to set priorities for organ transplant recipients.
  - Lawyers and judges
  - Accountants

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WHAT IS "PROFESSIONAL ETHICS"?

- Computer professional issues:
  - How much risk (to privacy, security, safety) is acceptable in a system?
  - What uses of another company's intellectual property are acceptable?

- Honesty is one of the most fundamental ethical values; however, many ethical problems are more subtle than the choice of being honest or dishonest

- Some ethical issues are controversial

9.2 ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Special Aspects of Professional Ethics

- A professional is an expert in a field
  - Customers rely on the knowledge, expertise, and honesty of the professional
- The products of many professionals (e.g., highway bridges, investment advice, surgery protocols, and computer systems) profoundly affect large numbers of people
  - A computer professional's work can affect the life, health, finances, freedom, and future of a client or members of the public
  - A professional can cause great harm through dishonesty, carelessness, or incompetence
    - The victims have little ability to protect themselves; they are not the direct customers of the professional and have no direct control or decision making role in choosing the product or making decisions about its quality and safety

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

- Software Engineering Code of Ethics and Professional Practice

http://www.acm.org/about/se-code

- ACM Code of Ethics and Professional Conduct

https://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Special Aspects of Professional Ethics

- Professionals must maintain up to date skills and knowledge
  - Because of the complexity, risks, and impact of computer systems, a professional has an ethical responsibility not simply to avoid intentional evil, but to exercise a high degree of care and follow good professional practices to reduce the likelihood of problems
  - A responsibility to maintain an expected level of competence and be up to date on current knowledge, technology, and standards of the profession

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Professional Codes of Ethics

- Many professional organizations have codes of professional conduct
  - Provide a general statement of ethical values and remind people in the profession that ethical behavior is an essential part of their job
  - Provide valuable guidance for new or young members of the profession who want to behave ethically but do not know what is expected of them

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Guidelines and Professional Responsibilities

- Developers and institutional users of computer systems must view the system's role and their responsibility in a wide enough context

- Include users (such as medical staff, technicians, pilots, office workers) in the design and testing stages to provide safe and useful systems
  - A system for a newborn nursery at a hospital rounded each baby's weight to the nearest pound.
    - For premature babies, the difference of a few ounces is crucial information

- Do a thorough, careful job when planning and scheduling a project and when writing bids or contracts
  - allocate sufficient time and budget for testing

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Guidelines and Professional Responsibilities

- Design for real users
  - input errors will always exist
  - there are techniques for catching many kinds of errors and for reducing the damage that errors cause

- Don't assume existing software is safe or correct; review and test it

- Be open and honest about capabilities, safety, and limitations of software
  - Honesty of salespeople is hardly a new issue
  - hiding known, serious flaws and lying to customers are wrong

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Guidelines and Professional Responsibilities

- Require a convincing case for safety
  - suspend or delay use of the system in the absence of a convincing case for safety, rather than to proceed in the absence of a convincing case for disaster

- Pay attention to defaults
  - In his book, The Road Ahead , Bill Gates tells that a team of Microsoft programmers developed and tested a handwriting recognition system
  - When they thought it was working fine, they brought it to him to try. It failed. All the team members were right-handed. Gates is left-handed.

ETHICAL GUIDELINES FOR COMPUTER PROFESSIONALS

Guidelines and Professional Responsibilities

- Develop communication skills
  - There are many situations in which a computer professional has to explain technical issues to customers and coworkers.
  - Learning how to organize information, distinguishing what is important to communicate and what is not, engaging the listener actively in the conversation to maintain interest, and so on, will help make one's presentations more effective and help to ensure that the client or coworker is truly informed.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- Recommended by the ACM/IEEE-CS Joint Task Force on Software Engineering Ethics and Professional Practices and jointly approved by the ACM and the IEEE-CS as the standard for teaching and practicing software engineering

- 1. PUBLIC – Software engineers shall act consistently with the public interest.

- 2. CLIENT AND EMPLOYER – Software engineers shall act in a manner that is in the best interests of their client and employer consistent with the public interest.

- 3. PRODUCT – Software engineers shall ensure that their products and related modifications meet the highest professional standards possible

- 4. JUDGMENT – Software engineers shall maintain integrity and independence in their professional judgment

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 5. MANAGEMENT – Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.

- 6. PROFESSION – Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.

- 7. COLLEAGUES – Software engineers shall be fair to and supportive of their colleagues.

- 8. SELF – Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Full version:

Principle 1: Public

- Software engineers shall act consistently with the public interest. In particular, software engineers shall, as appropriate:

- 1.01. Accept full responsibility for their own work.

- 1.02. Moderate the interests of the software engineer, the employer, the client, and the users with the public good.

- 1.03. Approve software only if they have a well-founded belief that it is safe, meets specifications, passes appropriate tests, and does not diminish quality of life, diminish privacy, or harm the environment. The ultimate effect of the work should be to the public good.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 1.04. Disclose to appropriate persons or authorities any actual or potential danger to the user, the public, or the environment, that they reasonably believe to be associated with software or related documents.

- 1.05. Cooperate in efforts to address matters of grave public concern caused by software, its installation, maintenance, support, or documentation.

- 1.06. Be fair and avoid deception in all statements, particularly public ones, concerning software or related documents, methods and tools.

- 1.07. Consider issues of physical disabilities, allocation of resources, economic disadvantage, and other factors that can diminish access to the benefits of software.

- 1.08. Be encouraged to volunteer professional skills to good causes and contribute to public education concerning the discipline.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 2: Client and Employer

- Software engineers shall act in a manner that is in the best interests of their client and employer, consistent with the public interest

- 2.01. Provide service in their areas of competence, being honest and forthright about any limitations of their experience and education.

- 2.02. Not knowingly use software that is obtained or retained either illegally or unethically.

- 2.03. Use the property of a client or employer only in ways properly authorized, and with the client's or employer's knowledge and consent.

- 2.04. Ensure that any document upon which they rely has been approved, when required, by someone authorized to approve it.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 2.05. Keep private any confidential information gained in their professional work, where such confidentiality is consistent with the public interest and consistent with the law.

- 2.06. Identify, document, collect evidence, and report to the client or the employer promptly if, in their opinion, a project is likely to fail, to prove too expensive, to violate intellectual property law, or otherwise to be problematic.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 2.07. Identify, document, and report significant issues of social concern, of which they are aware, in software or related documents, to the employer or the client.

- 2.08. Accept no outside work detrimental to the work they perform for their primary employer.

- 2.09. Promote no interest adverse to their employer or client, unless a higher ethical concern is being compromised; in that case, inform the employer or another appropriate authority of the ethical concern.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 3: Product

- Software engineers shall ensure that their products and related modifications meet the highest professional standards possible.

- 3.01. Strive for high quality, acceptable cost, and a reasonable schedule, ensuring significant tradeoffs are clear to and accepted by the employer and the client, and are available for consideration by the user and the public.

- 3.02. Ensure proper and achievable goals and objectives for any project on which they work or propose.

- 3.03. Identify, define, and address ethical, economic, cultural, legal and environmental issues related to work projects.

- 3.04. Ensure that they are qualified for any project on which they work or propose to work by an appropriate combination of education, training, and experience.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 3.05. Ensure an appropriate method is used for any project on which they work or propose to work.

- 3.06. Work to follow professional standards, when available, that are most appropriate for the task at hand, departing from these only when ethically or technically justified.

- 3.07. Strive to fully understand the specifications for software on which they work.

- 3.08. Ensure that specifications for software on which they work have been well documented, satisfy the users' requirements, and have the appropriate approvals.

- 3.09. Ensure realistic quantitative estimates of cost, scheduling, personnel, quality, and outcomes on any project on which they work or propose to work and provide an uncertainty assessment of these estimates.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 3.10. Ensure adequate testing, debugging, and review of software and related documents on which they work.

- 3.11. Ensure adequate documentation, including significant problems discovered and solutions adopted, for any project on which they work.

- 3.12. Work to develop software and related documents that respect the privacy of those who will be affected by that software.

- 3.13. Be careful to use only accurate data derived by ethical and lawful means, and use it only in ways properly authorized.

- 3.14. Maintain the integrity of data, being sensitive to outdated or flawed occurrences.

- 3.15 Treat all forms of software maintenance with the same professionalism as new development.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 4: Judgment

- Software engineers shall maintain integrity and independence in their professional judgment.

- 4.01. Temper all technical judgments by the need to support and maintain human values.

- 4.02 Only endorse documents either prepared under their supervision or within their areas of competence and with which they are in agreement.

- 4.03. Maintain professional objectivity with respect to any software or related documents they are asked to evaluate.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 4.04. Not engage in deceptive financial practices such as bribery, double billing, or other improper financial practices.

- 4.05. Disclose to all concerned parties those conflicts of interest that cannot reasonably be avoided or escaped.

- 4.06. Refuse to participate, as members or advisors, in a private, governmental or professional body concerned with software related issues, in which they, their employers or their clients have undisclosed potential conflicts of interest.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 5: Management

- Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.

- 5.01 Ensure good management for any project on which they work, including effective procedures for promotion of quality and reduction of risk.

- 5.02. Ensure that software engineers are informed of standards before being held to them.

- 5.03. Ensure that software engineers know the employer's policies and procedures for protecting passwords, files, and information that is confidential to the employer or confidential to others

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 5.04. Assign work only after taking into account appropriate contributions of education and experience tempered with a desire to further that education and experience.

- 5.05. Ensure realistic quantitative estimates of cost, scheduling, personnel, quality, and outcomes on any project on which they work or propose to work, and provide an uncertainty assessment of these estimates.

- 5.06. Attract potential software engineers only by full and accurate description of the conditions of employment.

- 5.07. Offer fair and just remuneration.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 5.08. Not unjustly prevent someone from taking a position for which that person is suitably qualified.

- 5.09. Ensure that there is a fair agreement concerning ownership of any software, processes, research, writing, or other intellectual property to which a software engineer has contributed.

- 5.10. Provide for due process in hearing charges of violation of an employer's policy or of this Code.

- 5.11. Not ask a software engineer to do anything inconsistent with this Code.

- 5.12. Not punish anyone for expressing ethical concerns about a project.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 6: Profession

- Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.

- 6.01. Help develop an organizational environment favorable to acting ethically.

- 6.02. Promote public knowledge of software engineering.

- 6.03. Extend software engineering knowledge by appropriate participation in professional organizations, meetings, and publications.

- 6.04. Support, as members of a profession, other software engineers striving to follow this Code.

- 6.05. Not promote their own interest at the expense of the profession, client, or employer.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 6.06. Obey all laws governing their work, unless, in exceptional circumstances, such compliance is inconsistent with the public interest.

- 6.07. Be accurate in stating the characteristics of software on which they work, avoiding not only false claims but also claims that might reasonably be supposed to be speculative, vacuous, deceptive, misleading, or doubtful.

- 6.08. Take responsibility for detecting, correcting, and reporting errors in software and associated documents on which they work.

- 6.09. Ensure that clients, employers, and supervisors know of the software engineer's commitment to this Code of ethics, and the subsequent ramifications of such commitment

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 6.10. Avoid associations with businesses and organizations which are in conflict with this code.

- 6.11. Recognize that violations of this Code are inconsistent with being a professional software engineer.

- 6.12. Express concerns to the people involved when significant violations of this Code are detected unless this is impossible, counter-productive, or dangerous.

- 6.13. Report significant violations of this Code to appropriate authorities when it is clear that consultation with people involved in these significant violations is impossible, counter-productive, or dangerous.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 7: Colleagues

- Software engineers shall be fair to and supportive of their colleagues

- 7.01. Encourage colleagues to adhere to this Code.

- 7.02. Assist colleagues in professional development.

- 7.03. Credit fully the work of others and refrain from taking undue credit.

- 7.04. Review the work of others in an objective, candid, and properly-documented way.

- 7.05. Give a fair hearing to the opinions, concerns, or complaints of a colleague.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 7.06. Assist colleagues in being fully aware of current standard work practices including policies and procedures for protecting passwords, files, and other confidential information, and security measures in general.

- 7.07. Not unfairly intervene in the career of any colleague; however, concern for the employer, the client or public interest may compel software engineers, in good faith, to question the competence of a colleague.

- 7.08. In situations outside of their own areas of competence, call upon the opinions of other professionals who have competence in that area.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

Principle 8: Self

- Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession

- 8.01. Further their knowledge of developments in the analysis, specification, design, development, maintenance, and testing of software and related documents, together with the management of the development process.

- 8.02. Improve their ability to create safe, reliable, and useful quality software at reasonable cost and within a reasonable time.

- 8.03. Improve their ability to produce accurate, informative, and well-written documentation.

SOFTWARE ENGINEERING CODE OF ETHICS AND PROFESSIONAL PRACTICE (VERSION 5.2)

- 8.04. Improve their understanding of the software and related documents on which they work and of the environment in which they will be used.

- 8.05. Improve their knowledge of relevant standards and the law governing the software and related documents on which they work.

- 8.06 Improve their knowledge of this Code, its interpretation, and its application to their work.

- 8.07 Not give unfair treatment to anyone because of any irrelevant prejudices.

- 8.08. Not influence others to undertake any action that involves a breach of this Code.

- 8.09. Recognize that personal violations of this Code are inconsistent with being a professional software engineer.

ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

- 1. GENERAL MORAL IMPERATIVES.

- *As an ACM member I will ….*

- **1.1 Contribute to society and human well-being.**
  - Programmers should work to develop computer systems that can reduce negative consequences to society, such as threats to safety and health

- **1.2 Avoid harm to others**
  - Computer systems have an indirect impact on third parties. They can cause loss of information and resources that might result severely harmful for users, the general public, or employers. Therefore, software developers should minimize the risk of harming others due to coding errors, or security issues, by following standards to design and test systems

ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

- *As an ACM member I will ....*

- **1.3 Be honest and trustworthy.**
  - This principle encourages programmers to be honest and aware of their limitations in knowledge and education when writing computer systems. Also, if a programmer knows there is something wrong with a computer system, he or she should report it immediately to avoid undesirable consequences.

- **1.4 Be fair and take action not to discriminate.**
  - The values of equality, tolerance, respect for others, and the principles of equal justice govern this imperative. Discrimination on the basis of race, sex, religion, age, disability, national origin, or other such factors is an explicit violation of ACM policy and will not be tolerated.

ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

- *As an ACM member I will ….*

- **1.5 Honor property rights including copyrights and patent.**
  - Violation of copyrights, patents, trade secrets and the terms of license agreements is prohibited by law in most circumstances. Even when software is not so protected, such violations are contrary to professional behavior. Copies of software should be made only with proper authorization. Unauthorized duplication of materials must not be condoned.

- **1.6 Give proper credit for intellectual property.**
  - It is mandatory for every software developer to never use and take credit for someone else's work, even when it has not been protected by a copyright law, patent, etc. They must recognize and fully credit other people's works, and they should use their own ideas to develop software.

ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

- *As an ACM member I will ….*

- **1.7 Respect the privacy of others.**
  - Computer systems are wrongly used by some people to violate the privacy of others. Software developers should write programs that can protect users' private information and that can avoid other undesired people to have unauthorized access to it.

- **1.8 Honor confidentiality.**
  - Unless required by law or any other ethical guideline, a programmer must keep secret any additional information related to his or her employer that arises from working in a project.

ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

- 2. MORE SPECIFIC PROFESSIONAL RESPONSIBILITIES.

- *As an ACM member I will ....*

- **2.1 Strive to achieve the highest quality, effectiveness and dignity in both the process and products of professional work.**

- **2.2 Acquire and maintain professional competence.**

- **2.3 Know and respect existing laws pertaining to professional work.**

- **2.4 Accept and provide appropriate professional review.**

- **2.5 Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks.**

- **2.6 Honor contracts, agreements, and assigned responsibilities.**

- **2.7 Improve public understanding of computing and its consequences.**

- **2.8 Access computing and communication resources only when authorized to do so.**

ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

- **3. ORGANIZATIONAL LEADERSHIP IMPERATIVES.**

- *As an ACM member and an organizational leader, I will ....*

- 3.1 Articulate social responsibilities of members of an organizational unit and encourage full acceptance of those responsibilities.

- 3.2 Manage personnel and resources to design and build information systems that enhance the quality of working life.

- 3.3 Acknowledge and support proper and authorized uses of an organization's computing and communication resources.

- 3.4 Ensure that users and those who will be affected by a system have their needs clearly articulated during the assessment and design of requirements; later the system must be validated to meet requirements.

- 3.5 Articulate and support policies that protect the dignity of users and others affected by a computing system.

- 3.6 Create opportunities for members of the organization to learn the principles and limitations of computer systems.

9.3 SCENARIOS

Introduction and Methodology

- We look for ways to reduce negative consequences

- 1. Brainstorming phase
  - List all the people and organizations affected (the stakeholders)
  - List risks, issues, problems, and consequences
  - List benefits. Identify who gets each benefit
  - In cases where there is no simple yes or no decision, but rather one has to choose some action, list possible actions

SCENARIOS

Introduction and Methodology

- **2. Analysis phase**
  - Identify responsibilities of the decision maker
  - Identify rights of stakeholders
  - Consider the impact of the options on the stakeholders (consequences, risks, benefits, harms, costs)
  - Categorize each potential action as ethically obligatory, prohibited, or acceptable
  - When there are multiple options, select one, considering the ethical merits of each, courtesy to others, practicality, self-interest, personal preferences, etc.

SCENARIOS

Scenario 1: Protecting Personal Data

- Your customer is a community clinic that works with families with problems of family violence.

- It has three sites in the same city, including a shelter for battered women and children.

- The director wants a computerized record and appointment system, networked for the three sites.

- She wants a few laptop computers on which staffers can carry records when they visit clients at home and stay in touch with clients by email.

- She asked about an app for staffers' smartphones by which they could access records at social service agencies.

- At the shelter, staffers use only first names for clients, but the records contain last names and forwarding addresses of women who have recently left.

- The clinic's budget is small.

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SCENARIOS

Scenario 1: Protecting Personal Data

- The clinic director is likely to be aware of the sensitivity of the information in the records and to know that inappropriate release of information can result in embarrassment for families using the clinic and physical harm to women who use the shelter

- **The director** might not be aware of the risks of the technologies in the system she wants

- The computer professional has specialized knowledge in this area

- The most vulnerable stakeholders here are the clients of the clinic and their family members, and they do not take part in your negotiations with the director

- **The computer professional,** the director, the clinic employees, and the donors or agencies that fund the clinic are also stakeholders.

SCENARIOS

Scenario 1: Protecting Personal Data

- **The computer professional** suggests measures to protect client privacy

- The computer professional suggests the director that carrying client records on laptops or phones has serious risks, citing examples of loss and theft of devices containing large amounts of sensitive personal data

- The computer professional advises that the system encrypt records on laptops, and suggests that the director buy laptops with extra security features (such as thumbprint readers, so that only authorized employees can access the data, or remote tracking or erasing features)

- The features will make the system more expensive

SCENARIOS

Scenario 1: Protecting Personal Data

- The director says the clinic cannot afford all the security features

- The computer professional has an ethical responsibility to consider the potential harm to clients from exposure of sensitive information and not to build a system without adequate privacy protection
  - The most difficult decision may be deciding what is adequate
  - Encryption of personal records on portable devices might be essential
  - Monitoring employee Web access is probably not

- There is not always a sharp, clear line between sufficient and insufficient protection
  - rely on your professional knowledge, on being up to date about current risks and security measures, on good judgment, and perhaps on consulting others who develop systems for similar applications (SE Code 7.08).

SCENARIOS

Scenario 2: Email System With Targeted Ads

- Your company is developing a free email service that will include targeted advertising based on the content of the email messages (similar to Google's Gmail).

- You are part of the team designing the system.

- What are your ethical responsibilities?

SCENARIOS

Scenario 2: Email System With Targeted Ads

- Protect the email!
  - No humans will read the messages
  - Informed consent
  - Do not target based on sensitive topics, such as mortgage foreclosures, health, and religion, then the records the system stores will not have information about those subjects
  - The designers should consider restrictions on the set of topics the system uses for targeting

SCENARIOS

Scenario 3: Webcams in School Laptops

- As part of your responsibilities, you oversee the installation of software packages for large orders.

- A recent order of laptops for a local school district requires webcam software to be loaded.

- You know that this software allows for remote activation of the webcam.

SCENARIOS

Scenario 3: Webcams in School Laptops

- Our responsibilities go beyond customers, to employers, users and the public
  - The stakeholders include not only the school district administration but also the students, parents, teachers, and our own company
- If students are the recipients of the laptops, then they and their parents need to know about the remote activation capability.

SCENARIOS

Scenario 3: Webcams in School Laptops

- Suppose the school district is unaware that the cameras can be activated remotely.

- Suppose a dishonest school employee activates several webcams and eavesdrops on students in their homes.

- The violation is uncovered and accusations fly. Parents want to know why the school would install such software and why it did not provide proper security measures. School administrators, caught completely off guard, want to know why you did not inform them about the risks and offer them additional security.

- As with many scenarios, there might not be a happy ending. It is possible that the school district will turn down your proposal for better security or cannot afford an alternative, more secure product.

- Sometimes, your only ethical course of action is to pass on the contract

SCENARIOS

Scenario 4: Publishing Security Vulnerabilities

- Three MIT students planned to present a paper at a security conference describing security vulnerabilities in Boston's transit fare system.

- At the request of the transit authority, a judge ordered the students to cancel the presentation and not to distribute their research.

- The students are debating whether they should circulate their paper on the Web.

- Imagine that you are one of the students.

SCENARIOS

Scenario 4: Publishing Security Vulnerabilities

- What are some reasons why you might want to circulate the paper?
  - your freedom of speech
  - make other security experts aware of the problems, perhaps to generate work on a security patch, perhaps to spur the transit authority to fix the problems
- Maintaining a peaceful, civil society requires that we sometimes accept a decision of an impartial adjudicator.

SCENARIOS

Scenario 4: Publishing Security Vulnerabilities

- Publishing the vulnerabilities has several risks
  - The transit system could lose a substantial amount of money it people exploit the information
  - The students could face legal action for violating the order
  - The university could face negative consequences because the work was part of a school project

- In the actual case, the transit authority requested a five-month ban to provide time for them to fix the problems.

- The system has plenty of flaws, but it is better than most.

SCENARIOS

Scenario 5: Specifications

- You are a relatively junior programmer working on modules that collect data from loan application forms and convert them to formats required by the parts of the program that evaluate the applications.

- You find that some demographic data are missing from some forms, particularly race and age.

- What should your program do? What should you do?

SCENARIOS

Scenario 5: Specifications

- Your company has an ethical and business obligation to ensure that the specifications are complete and to produce a program that meets them

- You do not have the authority to make a decision not covered by the specifications without consulting the client or higher-level managers in your company who are responsible for the program design

- You (and your manager) might not know enough about the uses of the program to make a good decision

- Suppose the company later uses some of your modules in another project, say, one that evaluates patients for inclusion in research studies on new drugs

- Some diseases and drugs affect people in different ethnic groups differently

SCENARIOS

Scenario 6: Schedule Pressures – Safety-critical

- Your team is working on a computer-controlled device for treating cancerous tumors.

- The computer controls direction, intensity, and timing of a beam that destroys the tumor.

- Various delays have put the project behind schedule, and the deadline is approaching.

- There will not be time to complete all the planned testing.

- The system has been functioning properly in the routine treatment scenarios tested so far.

- You are the project manager, and you are considering whether to deliver the system on time, while continuing testing and making patches if the team finds bugs.

SCENARIOS

Scenario 6: Schedule Pressures – Safety-critical

- **There are often pressures to reduce software testing.**

- Testing is one of the last steps in development, so when deadlines approach, testing schedules often shrink.

- The central issue here is safety
  - delivering the system on time benefits the company but could endanger the patients

- Stakeholders:
  - patients
  - hospitals and clinics who will purchase the machine

- The Therac-25 case illustrated that a complex system can function correctly hundreds of times but fail with fatal consequences in unusual circumstances

- You should delay delivery and complete the tests

- You have an ethical obligation to use your professional judgment in a way that does not expose people, without their knowledge, to additional harm

SCENARIOS

Scenario 7: Schedule Pressures – Product to market

- Most products are not safety-critical ones where flaws might threaten people's lives.
  - You are a programmer working for a very small start-up company.
  - The company has a modest product line and is now developing a truly innovative new product.
  - Everyone is working 60-hour weeks and the target release date is nine months away.
  - The bulk of the programming and testing is done.
  - You are about to begin the beta testing.
  - The owner of the company (who is not a programmer) has learned about an annual industry show that would be ideal for introducing the new product.
  - The show is in two months.
  - The owner talks with the project manager.
  - They decide to skip the beta testing and start making plans for an early release.

SCENARIOS

Scenario 7: Schedule Pressures – Product to market

- Is the programmer even in a position to protest?
  - People listen to you, provided, of course, you are respectful, thoughtful, and well prepared
  - The CEO of a small electronics company proposed producing a new version of a product within three months.
    - The director of engineering (an excellent, experienced software engineer) wrote up a detailed schedule of all the necessary steps and told the CEO that the project would take more than a year.
    - The software engineer did not simply tell the CEO that the three-month plan was unreasonable. He documented his claim.
    - The CEO replaced him with someone who had a "can do" attitude.
    - The software engineer did not want the stress of working under an extremely unreasonable schedule nor the responsibility for the inevitable failure.
    - Leaving the company was not a bad thing.

SCENARIOS

Scenario 8: Software License Violation

- Your company has 25 licenses for a computer program, but you discover that it has been copied onto 80 computers.

- The first step here is to inform your supervisor that the copies violate the license agreement

- If you are the person who signed the license agreements, they you are obligated to honor it.

- The name on the license could expose you to legal risk, or unethical managers in your company could make you a scapegoat.

- Report the violation or quit your job and have your name removed from the license to protect yourself.

SCENARIOS

Scenario 9: Going Public

- Suppose you are a member of a team working on a computer-controlled crash avoidance system for automobiles.

- You think the system has a flaw that could endanger people.

- The project manager does not seem concerned and expects to announce completion of the project soon.

- Do you have an ethical obligation to do something?
  - Given the potential consequences, yes
  - try talking with higher ups
  - If they don't agree, then an option is going outside the company to the customer, to the news media, or to a government agency

  "If there is something that ought to be corrected inside an organization, the most effective way to do it is to do it within the organization and exhaust all possibilities there . . . you might have to go to the extreme of publishing these things, but you should never start that way"

SCENARIOS

Scenario 10: Release of Personal Information

- You work for the IRS, the Social Security Administration, a movie-rental company, or an Internet service provider.

- Someone asks you to get a copy of records about a particular person.

- He will pay you $500.

SCENARIOS

Scenario 11: Conflict of Interest

- You have a small consulting business.

- The CyberStuff company plans to buy software to run a cloud data-storage business.

- CyberStuff wants to hire you to evaluate bids from vendors.

- Your spouse works for NetWorkx and did most of the work in writing the bid that NetWorkx plans to submit.

- You read the bid while your spouse was working on it and you think it is excellent.

- Do you tell CyberStuff about your spouse's connection with NetWorkx?

SCENARIOS

Scenario 12: Kickbacks and Disclosure

- You are an administrator at a major university.

- Your department selects a few brands of security software to recommend to students for their desktop computers, laptops, tablets, and other devices.

- One of the companies whose software you will evaluate takes you out to dinner, gives you free software (in addition to the security software), offers to pay your expenses to attend a professional conference on computer security, and offers to give the university a percentage of the price for every student who buys its security package.

SCENARIOS

Scenario 13: A Test Plan

- A team of programmers is developing a communications system for firefighters to use when fighting a fire.

- Firefighters will be able to communicate with each other, with supervisors near the scene, and with other emergency personnel.

- The programmers will test the system in a field near the company office.

SCENARIOS

Scenario 14: Artificial Intelligence and Sentencing

- You are part of a team developing a sophisticated program using artificial intelligence techniques to *help judges* make sentencing decisions for convicted criminals.

SCENARIOS

Scenario 14: Artificial Intelligence and Sentencing

- Suppose judges in your state use a sentencing decision system that displays similar cases for the judge to view.

- You are a programmer working for your state government.

- Your state has just made it a criminal offense to use a cellphone while taking a college exam.

- Your boss, a justice department administrator, tells you to modify the program to add this new category of crime and assign the same relevancy weights to cases as the program currently does for using a cellphone while driving a car (already illegal in your state).

SCENARIOS

Scenario 15: A Gracious Host

- You are the computer system administrator for a mid-sized company.

- You can monitor the company network from home, and you frequently work from home.

- Your niece, a college student, is visiting for a week.

- She asks to use your computer to check her email.

- Sure, you say.