Professional Ethics

- Moral issues that affect computer professionals
- Distinct enough to warrant separate study
- Professionals have special moral obligations

Profession

- Occupation
- Requires special knowledge and skills
- Characteristics
  - systematic theory
  - authority
  - community sanction
  - ethical codes
  - culture
A professional

• lives up to accepted codes of conduct
• is an expert in a field
• engages in work that can impact the public

A computer professional

• is employed in the computer, IT, information or communication fields
• examples: software engineer, tech writer, development managers, instructors, sys or network admins, support personnel
• not lawyers, accountants, or nurses
Moral Responsibilities of Computer Professionals

- obligations of all professionals
  - honesty
  - candor
  - competence
  - diligence
  - loyalty
  - discretion

- worthy of a client’s trust

- different obligations for people working on safety-critical software

- examples
  - aircraft and air traffic control
  - mass transit
  - nuclear reactors
  - missile systems
  - medical treatment systems
  - engineering design (bridges, buildings)
Codes of Ethics

- IEEE, ACM, SECEPP

- Purpose of Professional Codes
  - provide positive stimulus for ethical conduct
  - give guidance in morally complex situations
  - educate about ethical responsibilities
  - specify grounds for punishment
  - inform public about expectations from professionals
  - sensitize professionals to ethical aspects of their jobs
  - enhance the status of the profession

- Defenses
  - central to advising engineers on how to behave
  - guides for ethical decision making
● Criticisms

- codes have no teeth–no loss of job, no need to be member
- may be too vague, self-serving or inconsistent
- limited concerns can lead to loopholes
  privacy, accuracy, property, accessibility
- directives are to be followed, not deliberated
- no methodology for conflict resolution
- confounding of principles for individuals and for the profession
- sanctions make codes of conduct instead of ethical rules
• Functions of Codes
  
  – code of ethics
    vision and objectives
    shared with society
  
  – code of conduct
    attitude and behavior
    shared with other professions
  
  – code of practice
    operational activities within profession
    violations lead to legal action
    unique to a particular profession
IEEE Code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;

2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;

3. to be honest and realistic in stating claims or estimates based on available data;

4. to reject bribery in all its forms;

5. to improve the understanding of technology, its appropriate application, and potential consequences;

6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;

8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;

9. to avoid injuring others, their property, reputation, or employment by false or malicious action;

10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

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ACM Code of Ethics

GENERAL MORAL IMPERATIVES.
1.1 Contribute to society and human well-being.
1.2 Avoid harm to others.
1.3 Be honest and trustworthy.
1.4 Be fair and take action not to discriminate.
1.5 Honor property rights including copyrights and patent.
1.6 Give proper credit for intellectual property.
1.7 Respect the privacy of others.
1.8 Honor confidentiality.
MORE SPECIFIC PROFESSIONAL RESPONSIBILITIES.
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.
ORGANIZATIONAL LEADERSHIP IMPERATIVES.
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.
COMPLIANCE WITH THE CODE.

4.1 Uphold and promote the principles of this Code.
4.2 Treat violations of this code as inconsistent with membership in the ACM.
SECEPP

- designed for all software engineers
- endorsed by ACM and IEEE-CS
- hierarchy of principles provides a conflict resolution mechanism
- should SECEPP be tied to licensure?
  yes – helps SE make ethical decisions
  no – discipline is immature
PREAMBLE

The short version of the code summarizes aspirations at a high level of abstraction. The clauses that are included in the full version give examples and details of how these aspirations change the way we act as software engineering professionals. Without the aspirations, the details can become legalistic and tedious; without the details, the aspirations can become high sounding but empty; together, the aspirations and the details form a cohesive code.

Software engineers shall commit themselves to making the analysis, specification, design, development, testing and maintenance of software a beneficial and respected profession. In accordance with their commitment to the health, safety and welfare of the public, software engineers shall adhere to the following Eight Principles:
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.

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.
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.

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 to contribute to public
Conflicts

• Employee Loyalty
  – no mutual loyalty, only employee to corporation
  – depends on corporation
  – employee should be loyal to corporation
  – how to balance conflicting loyalties?
• Whistle Blowing
  – attempt to alert public to misconduct within an organization
  – response to overt wrongdoing or to negligence
  – responses to whistle blowing
    * condemned as action take by disloyal troublemaker
    * regarded as a tragedy to be avoided
    * affirmed as a necessary obligation
  – examples
    * FBI messages before 9-11 (done)
    * Enron accounting (not done)
    * engineers recommendations denied by superiors—Challenger, Ford Pinto
  – BART engineers blew whistle and were fired
  – Parnas blew whistle on SDI, walked away from consulting contract
• Guidance for Professionals

- Professional codes provide guidance but are vague

SECEPP Example

6.12 Express concerns to the people involved when significant violations of this Code are detected unless this is impossible, counterproductive, 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, counterproductive, or dangerous.
• DeGeorge’s system
  – Permitted
    1. harm to be done is considerable
    2. concerns have been made known to superiors
    3. no response from superiors and channels exhausted
  – Obligated
    first three above
    4. documented evidence
    5. publicizing will prevent serious harm
• Discussion
  
  – James–
    too lenient, conditions 1-3 imply obligation
    too vague, harm not well-defined

  – Alpern–
    too lenient
    engineers must be willing to make greater sacrifices
    because they can do greater harm

  – Ladd–
    obligation with 1–3 means engineers must be moral
    heroes

  – McFarland
    engineers can be held to a higher standard of
    responsibility, but only as members of a profession
Responsibility, Liability, Accountability

- **Responsibility**
  - causality and intent (independent)
  - attributes blame (or praise)
  - usually attributed to individuals

- **Liability**
  - legal concept
  - no notion of blame
  - usually attributed to corporations and property owners
  - e.g. guest falls in your home

- **Accountability**
  - broader than accountability
  - group or individual must answer for wrongdoing
  - major barrier – “many hands”
    * apply accountability instead of responsibility
      more appropriate for a group
      can include more than one person
Physical vs. Software Systems

- physical systems have more redundancy and tolerance
- software systems are more brittle
- conditioning
  if a small change in input causes a large change in output, the system is said to be poorly conditioned