Computers and Society

Professional Ethics

Professions

Informally, the term *profession* refers to a vocation (a field of work) that requires a high level of education.

More formally, a profession is such a vocation that has explicit standards for entry into the vocation, and for continued practice of the vocation.
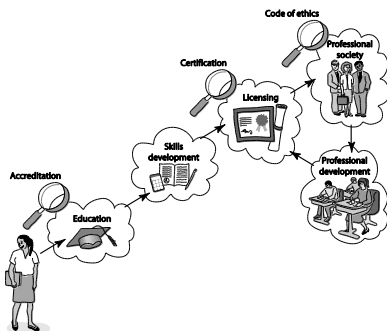
Some Professions

The following are all examples of professions in the U.S.:

• Law
• Medicine
• Accounting
• Education (below the university level)

Characteristics of a Profession

- Initial professional education
- Accreditation
- Skills development
- Certification
- Licensing
- Professional development
- Code of ethics
- Professional society

Attributes of Professions

Attributes of Professions (2)

Certification means that admission to the profession requires showing one is prepared to work in the field. This is often demonstrated by passing a test, although it can sometimes be demonstrated by completing an accredited degree program.

Members of the profession set the standards for certification. This is usually done through a professional organization.

Attributes of Professions (3)

Licensing means members of the profession have a legal credential allowing them to practice the profession. This credential is often issued by a government; in the U.S. states typically grant licenses.

Certification alone may be enough to earn a license, though there may be additional requirements.

Attributes of Professions (4)

Most professions also require *professional development* so that members of the profession maintain their skills and learn about new developments in the field.

Some professions such as education require members to earn advanced degrees.

Attributes of Professions (5)

- Most professions have a *professional society*
  - ACM (Association for Computing Machinery)
  - IEEE (Institute for Electrical and Electronics Engineers)
  - ASEE (American Society for Engineering Education)
  - AAAI (Association for Advancement of Artificial Intelligence)
  - Others?

Benefits of Professions

The main benefit of organizing a vocation as a profession is that it provides assurance of high quality service to the public.

It assures people that members of the profession have been well trained, and that incompetent people will be removed from the profession.

Drawbacks of Professions

The main drawback of professions is that the high standards for entry may limit the number of professionals working in the field. This can drive up prices and make finding a professional you need more difficult.

Because the profession regulates itself, there is a possibility for a *conflict of interest* in setting the number of licenses granted.

Code of Ethics

All professions have *codes of ethics*. These are sets of ethical principles that members of the profession are bound (required) to follow.

Computing Career and Profession

Key difference between computing related profession and other professions: license or certificate.

The ACM Council in May 1999 passed a resolution that stated, "ACM is opposed to the licensing of software engineers at this time because ACM believes that it is premature and would not be effective in addressing the problems of software quality and reliability."

IT and Computing Profession

"ACM believes it is important to foster the emergence of a true IT profession, not just software engineering. A field does not need licensing to be a profession."

White, J. and Simons, B. (2002). "ACM's Position on the Licensing of Software Engineer." In *Communications of the ACM.* 45(11) pp.91.

http://delivery.acm.org/10.1145/590000/581602/p91-white.pdf

Software Engineering Code of Ethics

The Software Engineering Code of Ethics was put jointly by ACM and IEEE (~1999). Some themes:

• Balance the interests of employers, clients, and self
• Avoid conflicts of interest
• Do high-quality technical work
• Reveal problems to appropriate people
• Behave legally and ethically

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

http://www.computer.org/cms/Computer.org/Publications/code-of-ethics.pdf

ACM Code of Ethics

• ACM Code of Ethics pre-dates the Software Engineering Code of Ethics (~1992)
  – General Moral Imperatives.
  – More Specific Professional Responsibilities.
  – Organizational Leadership Imperatives.
  – Compliance with the Code.

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

A MORE DETAILED EXAMINATION OF THE CODE

Preamble of Code

• Software engineers have opportunities to do good or do harm
• Software engineers ought to be committed to doing good
• Eight principles identify key ethical relationships and obligations within these relationship
• Code should be seen as a whole, not a collection of parts
• Concern for the public interest is paramount

Eight Principles Identify Morally Responsible Relationships

- Public
- Client and employer
- Product
- Judgment
- Management
- Profession
- Colleagues
- Self

Act Consistently with Public Interest

1.01 "Accept full responsibility for own work"
1.02 Balance competing interests
1.03 Approve software only if it is safe
1.04 Disclose actual/potential dangers
1.05 "Cooperate in efforts to address" public concerns
1.06 "Be fair and avoid deception in all statements"
1.07 Consider factors that diminish access to software
1.08 "Volunteer professional skills to good causes"

Clause 1.03
Approve Software Only If It Is Safe

Act in Best Interest of Client, Employer

2.01 Act within areas of competence
2.02 Don't use software obtained illegally
2.03 Only use property in authorized ways
2.04 Ensure documents are approved
2.05 Respect confidentiality
2.06 Promptly report problems with project
2.07 Report issues of social concern
2.08 Refuse outside work detrimental to job
2.09 Put employer's/client's interests first, unless overriding moral concern

Clause 2.02
Don't Use Software Obtained Illegally

Ensure Products Meet Highest Standards

3.01 Aim for "high quality, acceptable cost and a reasonable schedule," making trade-offs clear
3.02 "Ensure proper and achievable goals"
3.03 Face up to "ethical, economic, cultural, legal and environmental" issues
3.04 Ensure you are qualified for proposed work
3.05 Use appropriate project methodologies
3.06 Follow the most appropriate professional standards
3.07 "Strive to fully understand the specifications"
3.08 Ensure the specifications are correct and approved

4

Clause 3.02
"Ensure Proper and Achievable Goals"

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Ensure Products Meet Highest Standards

3.09 "Ensure realistic quantitative estimates of cost, scheduling, personnel, quality and outcomes"

3.10 "Ensure adequate testing, debugging, and review of software and related documents"

3.11 "Ensure adequate documentation"

3.12 Develop software and documents that respect privacy of those affected by software

3.13 Use only accurate data appropriately acquired

3.14 Maintain data integrity

3.15 Use same standards for software maintenance as software development

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Maintain Integrity in Professional Judgment

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

4.02 Understand and agree with documents before endorsing them

4.03 Remain objective when evaluating software or related documents

4.04 Do not engage in deceptive financial practices

4.05 Disclose conflicts of interest

4.06 Do not participate in decisions in which you, your employer, or your client has a potential conflict of interest

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Promote Effective Project Management

5.01 Ensure good project management procedures

5.02 Ensure software engineers know standards

5.03 Ensure software engineers know policies and procedures for protecting confidential information

5.04 Take employees' abilities into account before assigning work

5.05 Ensure reasonable estimates are made

5.06 Give full and accurate information to potential employees

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Promote Effective Project Management

5.07 Pay employees fairly

5.08 Do not unjustly prevent a qualified person from taking a job

5.09 Work out fair intellectual property agreements

5.10 Provide employees charged with misconduct due process

5.11 Do not ask someone to do anything violating the Code

5.12 "Do not punish anyone for expressing ethical concerns about a project"

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Advance the Profession

6.01 Help create an environment supporting ethical conduct

6.02 "Promote public knowledge of software engineering"

6.03 Participate in professional activities

6.04 Support others who are trying to follow this Code

6.05 Do not promote self-interest at expense of profession, client, or employer

6.06 Obey all laws unless there is an overriding public interest

6.07 Do not deceive others regarding the characteristics of software

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Clause 6.01   Help Create An Environment Supporting Ethical Conduct

Advance the Profession

6.08 Take responsibility for finding, correcting, and reporting errors in software and documentation

6.09 Ensure others know you are committed to the Code and what that means

6.10 Do not associate with businesses and organizations that are in conflict with Code

6.11 Understand violating the Code is inconsistent with being a professional

6.12 Share concerns about Code violations with the people involved

6.13 "Blow the whistle" when no alternative to reporting significant Code violations

Be Fair to and Supportive of Colleagues

7.01 "Encourage colleagues to adhere to this Code"

7.02 "Assist colleagues in professional development"

7.03 Give others the credit they deserve

7.04 Be objective when reviewing the work of others

7.05 Give colleagues a fair hearing

7.06 Help colleagues remain aware of work practices

7.07 Do not unfairly interfere with another's career, but protect the public interest

7.08 Bring in experts for situations outside your own area of competence.

Participate in Lifelong Learning

8.01 Stay current with developments in field

8.02 Improve ability to create high quality software

8.03 Improve ability to produce high quality documentation

8.04 Improve understanding of software and documentation used in work

8.05 Improve knowledge of relevant standards

8.06 Improve knowledge of this Code and its application

8.07 Do not treat others unfairly because of prejudices

8.08 Do not influence others to break the Code

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

Clause 8.02   Improve Ability to Create High Quality Software

Analysis of the Code

Analysis of Preamble

- No mechanical process for determining if an action is right or wrong
- Should not take an overly legalistic view of the Code
  - If Code doesn't forbid something, that doesn't mean it is morally acceptable
  - Judgment required
- Code reflects principles drawn from multiple ethical theories

Questions to Ask (1)

1. *Who is affected?*
   - Utilitarian's view focuses on determining how an action benefits or harms other people.
2. *Am I treating other human beings with respect?*
   - Kant's Categorical Imperative tells us to treat others as ends in themselves, rather than simply as means to an end.
3. *Would my decision hold up to public scrutiny?*
   - A cultural relativist is concerned about whether an action conforms with the mores of society.

Questions to Ask (2)

4. *How will those who are least empowered be affected?*
   - Rawl's second principle of justice requires us to consider whether inequalities are to the greatest benefit of the least-advantaged members of the society.
5. *Are my acts worthy of the ideal professional?*
   - The ethics of virtue is based on imitation of morally superior role models.

Origin of Virtue Ethics

- Aristotle
  - Happiness results from living a life of virtue
  - Intellectual virtue: developed through education
  - Moral virtue: developed by repeating appropriate acts
  - Deriving pleasure from a virtuous act is a sign that the virtue has been acquired
- Some virtues: Benevolence, courage, fairness, generosity, honesty, loyalty, patience, tolerance
- A person of strong moral character
  - possesses many virtues
  - knows right thing to do in each situation

Aristotle Believed Happiness Derives from Living a Life of Virtue

Strengths of Virtue Ethics

- Provides a motivation for good behavior
- Provides a solution to the problem of impartiality
  - Some virtues are partial (e.g., generosity)
  - Other virtues must be impartial (e.g., honesty)

Virtue Ethics Complements Other Theories

- Virtue ethics may not work as a stand-alone theory
- It may be a good complement to utilitarianism
- Allows rationale for action to be considered
- Solves problem of moral luck that plagued act utilitarianism

Alternative, Discipline-Independent List of Fundamental Principles

- Be impartial.
- Disclose information that others ought to know.
- Respect the rights of others.
- Treat others justly.
- Take responsibility for your actions and inactions.
- Take responsibility for the actions of those you supervise.
- Maintain your integrity.
- Continually improve your abilities.
- Share your knowledge, expertise, and values.