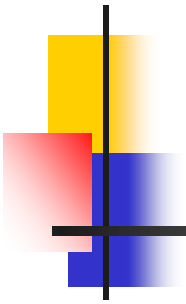
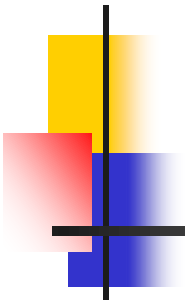


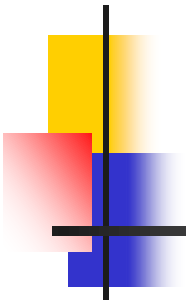
# Computer Ethics

- Computers are involved to some extent in almost every aspect of our lives
  - They often perform life-critical tasks
- Computer science is not regulated to the extent of medicine, air travel, or construction zoning
- Therefore, we need to carefully consider the issues of ethics



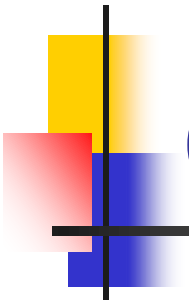
# Ethics

- Ethics are standards of moral conduct
  - Standards of right and wrong behavior
  - A gauge of personal integrity
  - The basis of trust and cooperation in relationships with others



# Ethical Principals

- Ethical principals are tools which are used to think through difficult situations.
- Three useful ethical principals:
  - An act is ethical if all of society benefits from the act.
  - An act is ethical if people are treated as an end and not as a means to an end.
  - An act is ethical if it is fair to all parties involved.



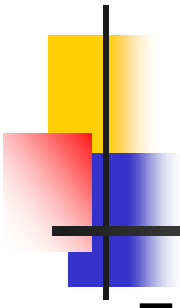
# Computer Ethics

- Computer ethics are morally acceptable use of computers
  - i.e. using computers appropriately
- Standards or guidelines are important in this industry, because technology changes are outstripping the legal system's ability to keep up

# Ethics for Computer Professionals

Computer Professionals:

- Are experts in their field,
- Know customers rely on their knowledge, expertise, and honesty,
- Understand their products (and related risks) affect many people,
- Follow good professional standards and practices,
- Maintain an expected level of competence and are up-to-date on current knowledge and technology, and
- Educate the non-computer professional



# Computer Ethics

- Four primary issues
  - **Privacy** – responsibility to protect data about individuals
  - **Accuracy** - responsibility of data collectors to authenticate information and ensure its accuracy
  - **Property** - who owns information and software and how can they be sold and exchanged
  - **Access** - responsibility of data collectors to control access and determine what information a person has the right to obtain about others and how the information can be used

# Problems with Large Databases

- Spreading information **without consent**
  - Some large companies use medical records and credit records as a factor in important personnel decisions
- Spreading **inaccurate** information
  - Mistakes in one computer file can easily migrate to others
  - Inaccurate data may linger for years

# U.S. Federal Privacy Laws

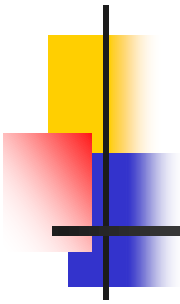
General Federal Privacy Laws:

- Freedom Of Information Act, 1968
- Privacy Act Of 1974
- Electronic Communications Privacy Act Of 1986
- Computer Matching And Privacy Protection Act Of 1988
- Computer Security Act Of 1987
- Federal Internet Privacy Protection Act Of 1997

# U.S. Federal Privacy Laws

Privacy Laws Affecting Private Institutions:

- Fair Credit Reporting Act, 1970
- Right To Financial Privacy Act Of 1978
- Privacy Protection Act Of 1980
- Cable Communications Policy Act Of 1984
- Electronic Communications Privacy Act Of 1986
- Video Privacy Protection Act Of 1988
- Consumer Internet Privacy Protection Act Of 1997
- Communications Privacy & Consumer Empowerment Act Of 1997
- Data Privacy Act Of 1997



# Private Networks

- Employers may legally monitor electronic mail
  - In 2001, 63% of companies monitored employee Internet connections including about two-thirds of the 60 billion electronic messages sent by 40 million e-mail users.
- Most online services reserve the right to censor content
- These rights lead to contentious issues over property rights versus free speech and privacy

# The Internet and the Web

- Most people don't worry about email privacy on the Web due to *illusion of anonymity*
  - Each e-mail you send results in at least 3 or 4 copies being stored on different computers.
- Web sites often load files on your computer  called *cookies* to record times and pages visited and other personal information
- ***Spyware -*** software that tracks your online movements, mines the information stored on your computer, or uses your computer for some task you know nothing about.

# General Internet Issues

- Inflammatory interchange of messages via internet (email, chat rooms, etc.)
- Chain mail
- Virus warning hoaxes
- “Spam” – unsolicited, bulk email

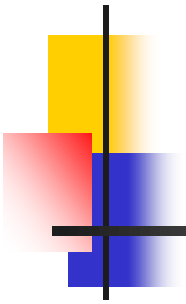
# E-Mail Netiquette

- Promptly respond to messages.
- Delete messages after you read them if you don’t need to save the information.
- Don’t send messages you wouldn’t want others to read.
- Keep the message short and to the point.
- Don’t type in all capital letters.
- Be careful with sarcasm and humor in your message.

# Internet Content & Free Speech Issues

- Information on internet includes hate, violence, and information that is harmful for children
  - How much of this should be regulated?
  - Do filters solve problems or create more?
- Is web site information used for course work and research **reliable**?

# Information Ownership Issues



- Illegal software copying (pirating)
- Infringement of copyrights by copying of pictures or text from web pages
- Plagiarism by copying text from other sources when original work is expected

# Terms

**INTELLECTUAL PROPERTY:**

**Intangible creations protected by law**

**TRADE SECRET:**

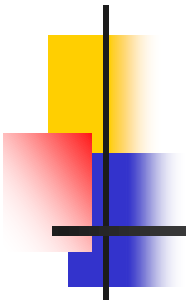
**Intellectual work or products belonging to a business, not in public domain**

**COPYRIGHT:**

**Statutory grant protecting intellectual property from copying by others for 28 years**

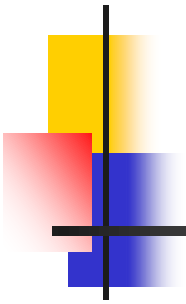
**PATENT:**

**Legal document granting owner exclusive monopoly on an invention for 17 years**



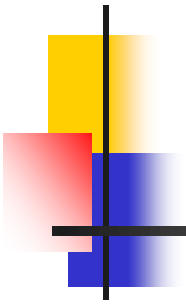
# Copyright Laws

- Software developers (or the companies they work for) own their programs.
- Software buyers only own the right to use the software according to the license agreement.
- No copying, reselling, lending, renting, leasing, or distributing is legal without the software owner's permission.



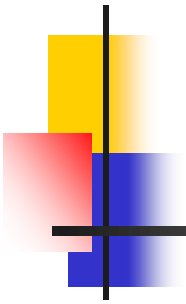
# Software Licenses

- There are four types of software licenses:
  - Public Domain
  - Freeware
  - Shareware
  - All Rights Reserved



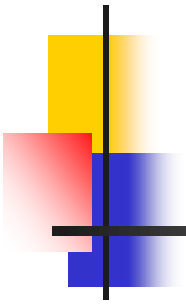
# Public Domain License

- Public domain software has no owner and is not protected by copyright law.
- It was either created with public funds, or the ownership was forfeited by the creator.
- Can be copied, sold, and/or modified
- Often is of poor quality/unreliable



# Freeware License

- Freeware is copyrighted software that is licensed to be copied and distributed without charge.
- Freeware is free, but it's still under the owner's control.
- Examples:
  - Eudora Light
  - Netscape

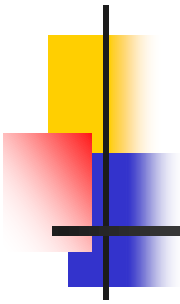


# Shareware License

- A shareware software license allows you to use the software for a trial period, but you must pay a registration fee to the owner for permanent use.
  - Some shareware trials expire on a certain date
  - Payment depends on the honor system
- Purchasing (the right to use) the software may also get you a version with more powerful features and published documentation.

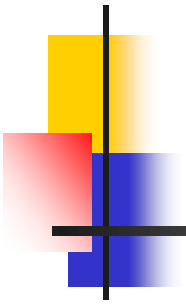
# All Rights Reserved License

- May be used by the purchaser according the exact details spelled out in the license agreement.
- You can’t legally use it--or even possess it-- without the owner’s permission.



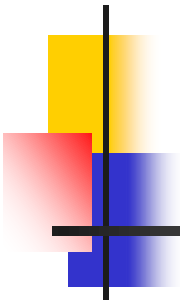
# Software Piracy

- SPA (Software Publishers Association) polices software piracy and mainly targets:
  - Illegal duplication
  - Sale of copyrighted software
  - Companies that purchase single copies and load the software on multiple computers or networks
- They rely on whistle-blowers.
- Penalties (for primary user of PC) may include fines up to $250,000 and/or imprisonment up to 5 years in jail



# System Quality

- Bug-free software is difficult to produce
- It must be carefully designed, developed, and tested
- Mistakes generated by computers can be far reaching
- Commenting and documenting software is required for effective maintenance throughout the life of the program



# System Quality

ETHICAL ISSUES:

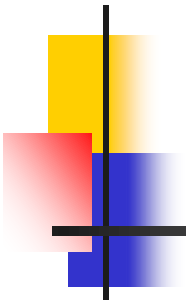
When is software, system or service ready for release?

SOCIAL ISSUES:

Can people trust quality of software, systems, services, data?

POLITICAL ISSUES:

Should congress or industry develop standards for software, hardware, data quality?

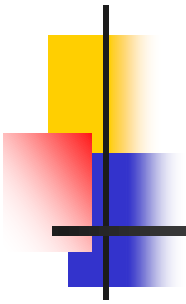


# Computer Crime

- Computer criminals -using a computer to commit an illegal act
- Who are computer criminals?
  - Employees – disgruntled or dishonest --the largest category
  - Outside users - customers or suppliers
  - “Hackers” and “crackers” - hackers do it “for fun” but crackers have malicious intent
  - Organized crime - tracking illegal enterprises, forgery, counterfeiting

# Types of Computer Crime

- Damage to computers, programs or files
  - Viruses - migrate through systems attached to files and programs
  - Worms - continuously self-replicate
- Theft
  - Of hardware, software, data, computer time
  - Software piracy - unauthorized copies of copyrighted material
- View/Manipulation
  - “Unauthorized entry” and “harmless message” still illegal



# Computer Security

- Computer security involves protecting:
  - information, hardware and software
  - from unauthorized use and damage and
  - from sabotage and natural disasters

# Measures to Protect Computer Security

- Restricting access both to the hardware locations (physical access) and into the system itself (over the network) using firewalls
- Implementing a plan to prevent break-ins
- Changing passwords frequently
- Making backup copies
- Using anti-virus software
- Encrypting data to frustrate interception
- Anticipating disasters (disaster recovery plan)
- Hiring trustworthy employees

# Computer Ethics for Computer Professionals

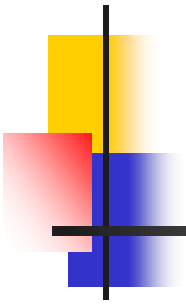
- **Competence**– Professionals keep up with the latest knowledge in their field and perform services only in their area of competence.
- **Responsibility**– Professionals are loyal to their clients or employees, and they won't disclose confidential information.
- **Integrity**– Professionals express their opinions based on facts, and they are impartial in their judgments.

# The ACM Code of Conduct

- According to the Association for Computing Machinery (ACM) code, a computing professional:
  - **Contributes to society and human well-being**
  - **Avoids harm to others**
  - **Is honest and trustworthy**
  - **Is fair and takes action not to discriminate**
  - **Honors property rights, including copyrights and patents**
  - **Gives proper credit when using the intellectual property of others**
  - **Respects other individuals' rights to privacy**
  - **Honors confidentiality**

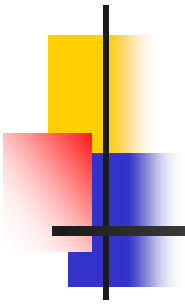
# Quality of Life Issues

- Rapid Change:
  - Reduced response time to competition
- Maintaining Boundaries:
  - Family, work, leisure
- Dependence And Vulnerability
- Employment:
  - Re-engineering job loss
- Equity & Access:
  - Increasing gap between haves and have nots
- Health Issues



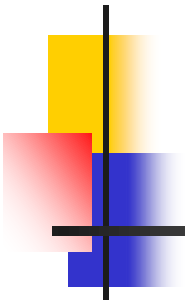
# Ergonomics

- Ergonomics:
  - helps computer users to avoid
    - physical and mental health risks
  - and to increase
    - productivity



# Physical Health Issues

- Avoid eyestrain and headache
  - Take regular breaks every couple of hours
  - Control ambient light and insure adequate monitor brightness
- Avoid back and neck pain
  - Have adjustable equipment with adequate back support
  - Keep monitor at, or slightly below eye level



# Physical Health Issues

- Avoid effects of electromagnetic fields (VDT radiation)
  - Possible connection to miscarriages and cancers, but no statistical support yet
  - Use caution if pregnant
- Avoid repetitive strain injury (RSI)
  - Injuries from fast, repetitive work
  - Carpal tunnel syndrome (CTS) - nerve and tendon damage in hands and wrists

# The Environment

- Microcomputers are the greatest user of electricity in the workplace
- "Green" PCs
  - System unit and display - minimize unnecessary energy consumption and power down when not in use
  - Manufacturing - avoids harmful chemicals in production, focus on chlorofluorocarbons (CFC's) which some blame for ozone layer depletion

# Personal Responsibility of Users

- **Conserve**
  - Turn computers off at end of work day
  - Use screen savers
- **Recycle**
  - Most of the paper we use is eligible
  - Dispose of old parts via recycling programs – most computer parts are dangerous in landfills
- **Educate**
  - Know the facts about ecological issues