

# Intellectual Property

## Lecture 4-2

Computers & Society (CPSC 430)

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# 3. Patent

- A public document that provides detailed description of invention
- A government office decides whether the invention is novel, non-obvious
- Provides owner with exclusive right to the invention
- Owner can prevent others from making, using, or selling invention for 20 years

# Software Patents

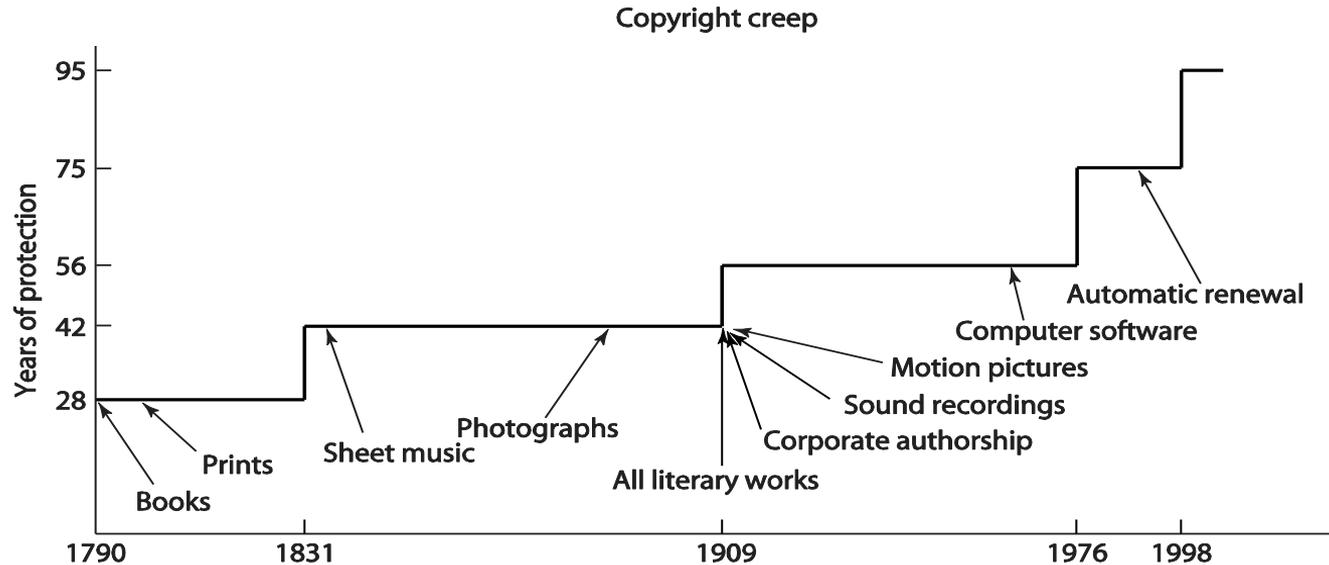
- Patent protection began in 1981
- Inventions can be patented, but not algorithms
- Patent Office having a hard time determining prior art
- Result: some bad patents have been issued
  - Amazon One-Click purchasing
  - Apple: squares with rounded corners
- General skepticism about value of software patents
- *Patent trolls: what are they? What do you think?*

# 4. Copyright

- Provides owner of an original work five rights
  - Reproduction
  - Distribution
  - Public display
  - Public performance
  - Production of derivative works
- Copyright-related industries represent >5% of U.S. gross domestic product (> \$500 billion/yr)
- Copyright protection has expanded greatly since 1790

# Copyright Creep

- Since 1790, protection for books extended from 28 years to 95 years or more
  - latest extension aims to protect Disney characters from entering public domain?
- Copyright Term Extension Act of 1998 challenged as unconstitutional
- U.S. Supreme Court disagreed: CTEA doesn't create perpetual copyrights



# Digital Rights Management

- Actions owners of IP take to protect their rights
- Approaches
  - Encrypt digital content
  - Digital marking so devices can recognize content as copy-protected
- **Example: the (failed) Secure Digital Music Initiative (2000)**
  - Consortium didn't stick together
  - Cracked by CS researchers
- **Example: Sony BMG Rootkit (2005)**
  - Made everyone angry; retracted
- **Example: online music stores (2003—2009)**
  - Started out with DRM, in part to lock people into platforms
- Now standard on streaming sites

# Fair Use/Fair Dealing

## USA: Fair Use

- Cases where copyrighted work can be reproduced without permission
- Use can be for any purpose
- Usage must be fair
  - Purpose, character of use
  - Nature of work
  - Amount of work copied
  - Effect on market for work

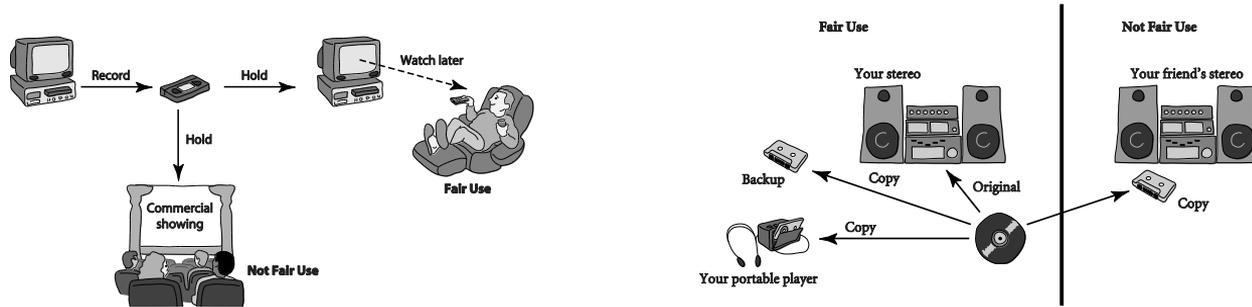
## Canada: Fair Dealing

- Three protected activities:
  - research or private study
  - criticism or review
  - news reporting
- Usage must be fair
  - purpose (commercial/private)
  - character (e.g., was it an isolated incident?)
  - amount copied from the original
  - alternatives (was copying necessary?)
  - nature (e.g., public availability of copyrighted work)
  - effect (does copy compete with original?)

*Is it ethical to break a digital lock in order to make fair use of a copyrighted work?*

# Some famous examples of fair use

- “Time shifting” (recording shows on VCR/DVR)
- “Space shifting” (transcoding music onto MP3 player)



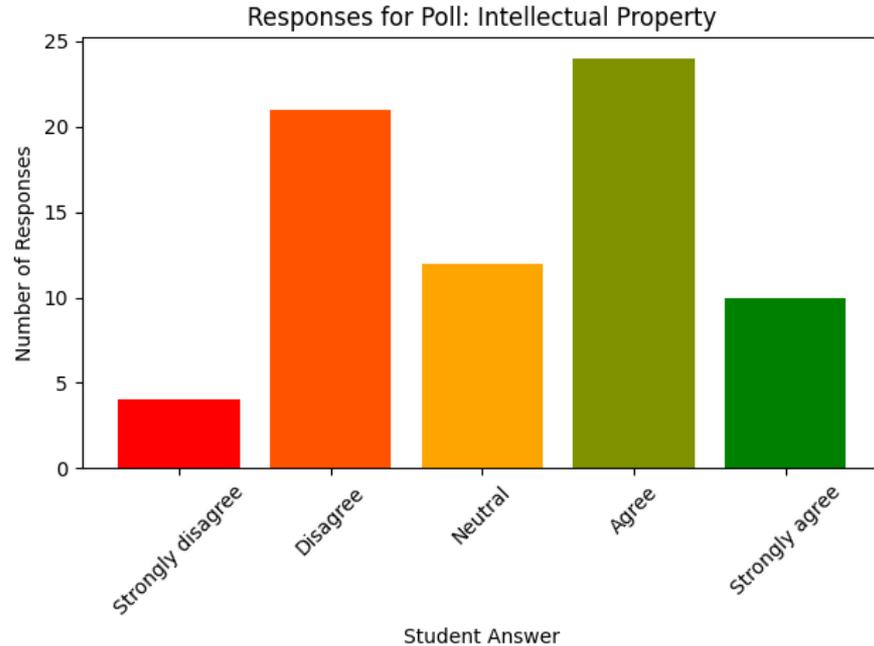
- Use of image thumbnails in search results
- Google books – indexing full texts

# Legitimacy of IP Protection for Software

- Software licenses typically prohibit you from making copies of software to sell or give away
  - Our focus is not on whether it's ethical to violate such a legal agreement after having agreed to it.
- Instead, we are considering:
  - whether society *should* give IP protection to software
  - if so, how this protection ought to be limited
  - what ethical argument can be used to justify this protection.

# Intellectual Property

“The government should refrain from prosecuting intellectual property infringement by individuals, such as peer-to-peer file sharing.”



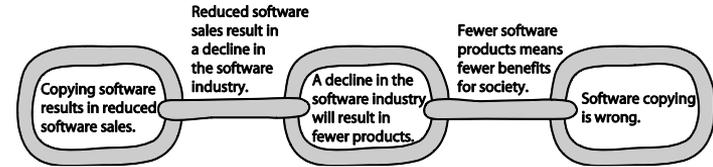
# Rights-based Analysis

- “Just deserts” argument
  - Programming is hard work that only a few can do
  - Programmers should be rewarded for their labor
    - Mixing my labor with something implies ownership
- Criticism of “just deserts” argument
  - Why does labor imply ownership?
    - Maybe mixing my labor with something means I lose my labor
    - Pour a can of tomato juice into the ocean: I don’t own the ocean
  - A society in which all labor went to common good could be just
  - Intellectual property not like physical property
    - I cut logs: I own the logs
    - I write a book: I get to restrict other people from copying the book
- *What do you think about this argument?*

# Utilitarian Analysis

- **Argument against copying**

- Copying software reduces software purchases...
- Leading to fewer software producers...
- Leading to lower production of new software...
- Leading to fewer benefits to society



- **Each of these claims can be debated**

- Not all who get free copies can afford to buy software
- Open-source movement demonstrates many people are willing to donate their software-writing skills
- Hardware industry wants to stimulate software industry; freemium model; many apps are supported via ads
- Difficult to quantify how much society would be harmed if certain software packages weren't released

- *What do you think about this argument?*

# Legal Action Against P2P

- **RIAA Lawsuits (2003)**
  - Sued 100s of high-volume sharers
- **Universities hotbed for sharing**
  - Responses: banning, signing site licenses
- **MGM vs. Grokster**
  - Grokster won at lower levels, eventually lost at Supreme Court
  - Ruling: the technology existed primarily for infringement
- **Pirate Bay:**
  - Repeatedly shut down, sued, operators fined and jailed (2013-15), but it's still up

# Open Source

- **A variety of licenses. Some typical ingredients:**
  - No restrictions preventing others from selling or giving away software
  - Source code included in distribution
  - No restrictions preventing others from modifying source code
  - No restrictions regarding how people can use software
  - Same rights apply to everyone receiving redistributions of the software (copyleft)
- **GNU Project (Richard Stallman, 1984-)**
  - Goal: Develop open-source, Unix-like operating system
  - Most components developed in late 1980s
- **Linux**
  - Linus Torvalds wrote Unix-like kernel in 1991
  - Combined with GNU components to make an OS
  - putting pressure on Microsoft, Apple, and companies selling proprietary versions of Unix

# Benefits and Drawbacks of Open Source

- **Benefits**

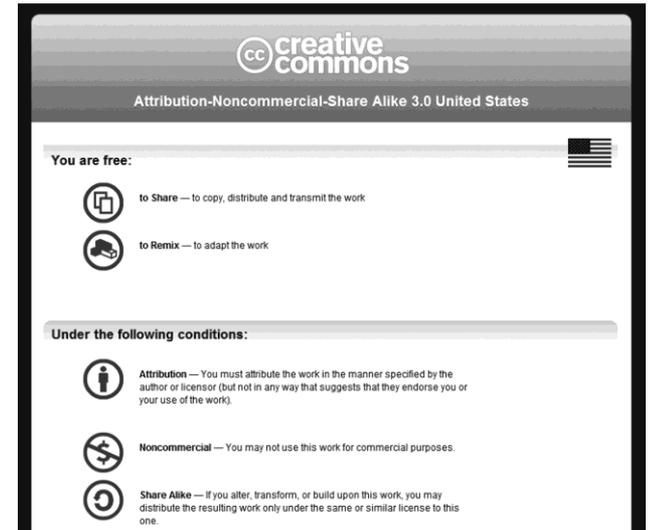
- Gives everyone opportunity to improve program
- New versions of programs appear more frequently
- Eliminates tension between obeying law and helping others
- Programs belong to entire community
- Shifts focus from manufacturing to service

- **Drawbacks**

- Without critical mass of developers, quality can be poor
- Without an “owner,” incompatible versions can arise
- Relatively weak graphical user interfaces
- Poor mechanism for stimulating innovation (no companies will spend billions on new programs)

# Creative Commons

- Under current copyright law, eligible works are copyrighted the moment they are created
- No copyright notice does not mean it's ok to copy
- Must contact people before using work
- That slows down creative reuse
- Free Creative Commons license indicates
  - Which kinds of copying are ok
  - Which rights are being retained
- Flickr and Magnatune two well-known sites using Creative Commons licenses



# Safe Software Development

- Reverse engineering okay
- Companies must protect against unconscious copying
- Solution: “clean room” software development strategy
  - Team 1 analyzes competitor’s program and writes specification
  - Team 2 uses specification to develop software
- Interestingly, same development strategies also used to ensure that open source licenses don’t “infect” commercial software