



# Lecture 4-3

# Intellectual Property

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# Participation Quiz

Let  $X$  denote the set of all sets that do not contain themselves. Is it the case that  $X \in X$ ?

- A. yes
- B. no
- C. none of the above

# Legitimacy of IP Protection for Software

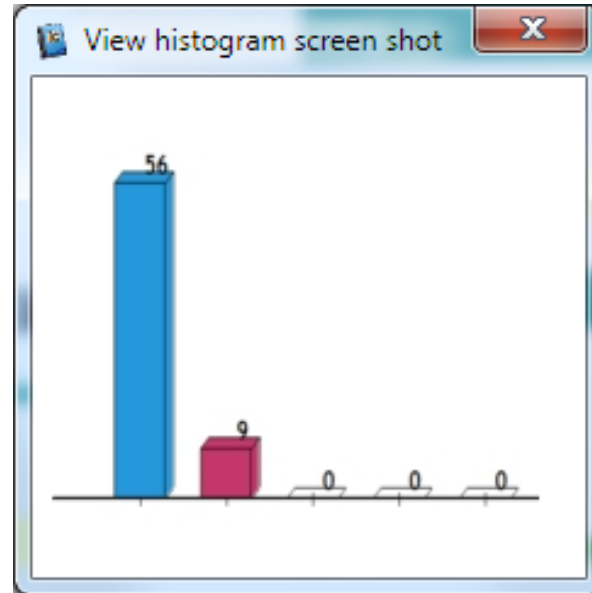
- Software licenses typically prohibit you from making copies of software to sell or give away
  - Our focus is not on whether it's ethical to violate such a legal agreement after having agreed to it.
- Instead, we will think about:
  - whether society *should* give IP protection to software
  - if so,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

*Break into groups; discuss and debate:*

*“The producers of software should have the right to prevent others from copying the software they produce.”*

# Intellectual Property

“The producers of software should have the right to prevent others from copying the software they produce.”

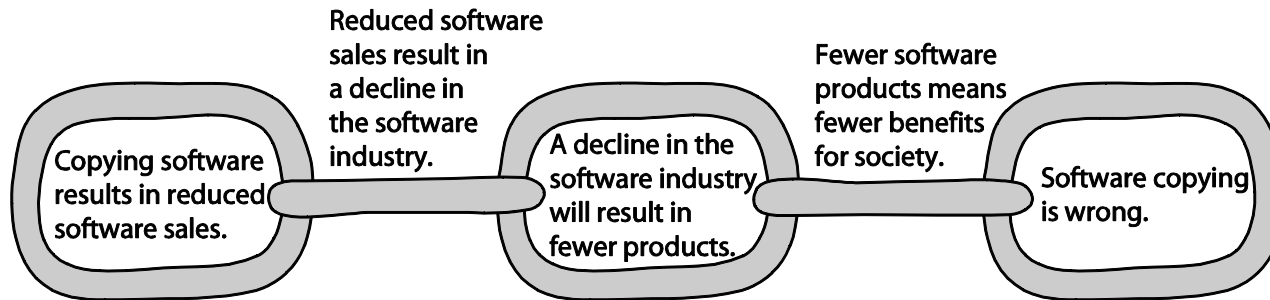


# Rights-based Analysis

- “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

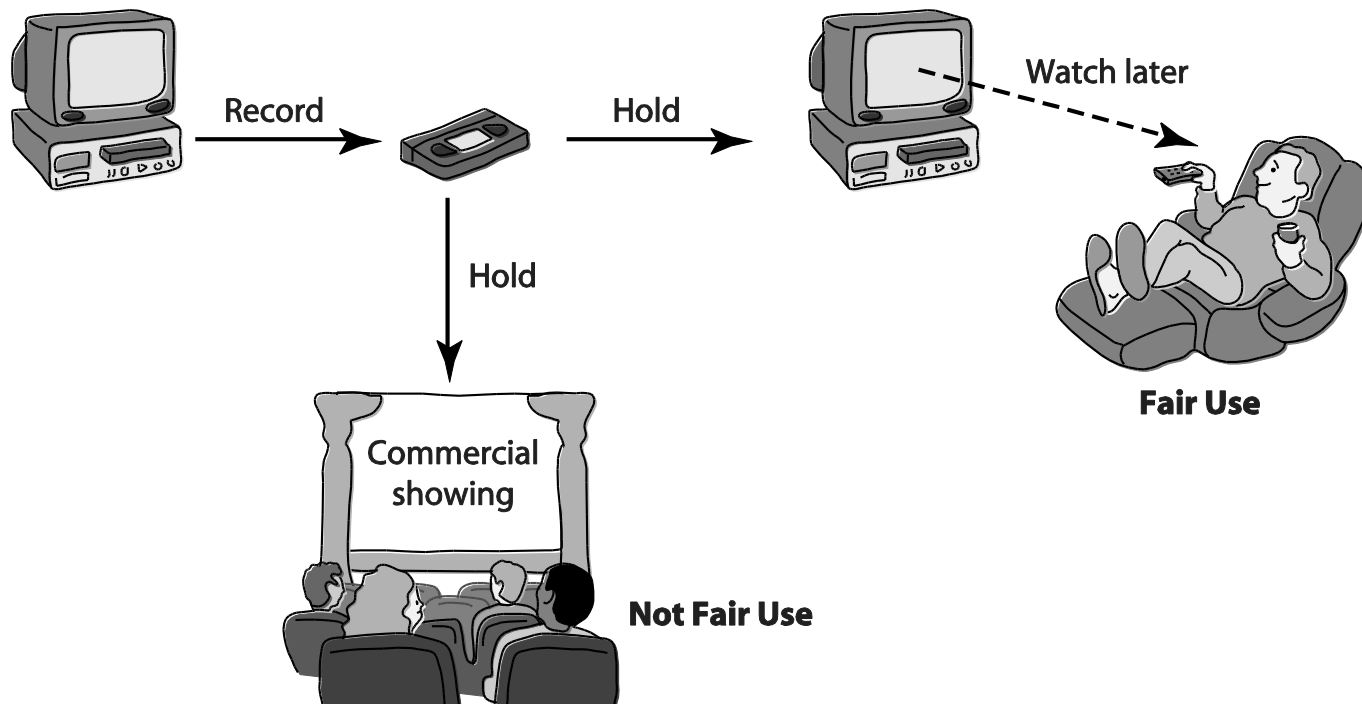


- Each of these claims can be debated
  - Not all who get free copies can afford to buy software
  - Open-source movement demonstrates many people are willing to donate their software-writing skills
  - Hardware industry wants to stimulate software industry; many apps are supported via ads
  - Difficult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

*What do you think about this argument?*

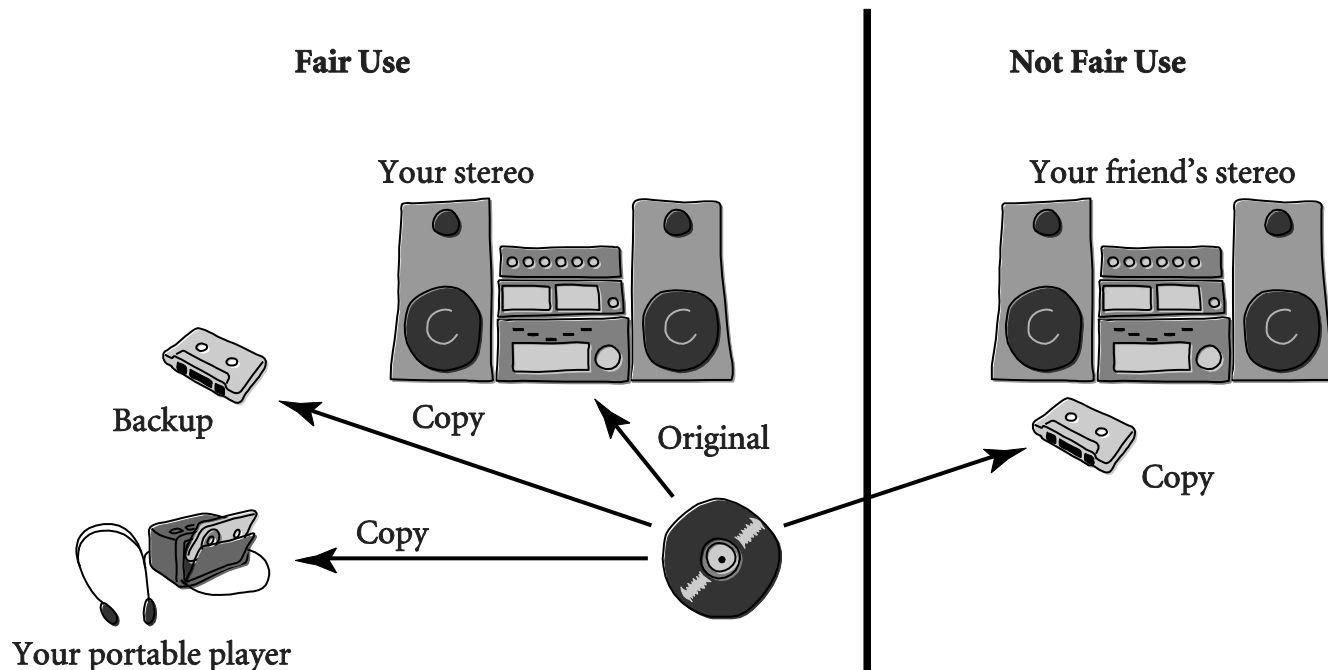
# Sony v. Universal City Studios

- Sony introduces Betamax VCR (1975)
- People start time shifting TV shows
- Movie studios sue Sony for copyright infringements
- U.S. Supreme Court rules (5-4) time shifting is fair use



# RIAA v. Diamond Multimedia Systems

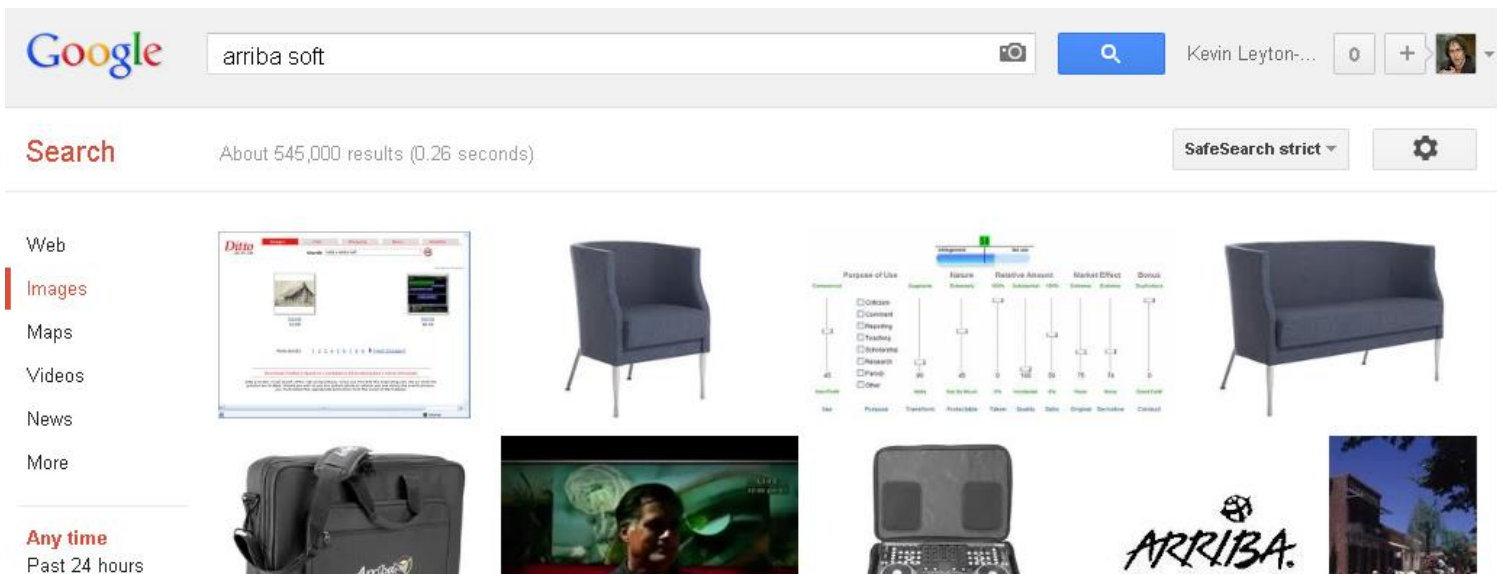
- MP3 compression allows songs to be stored in 10% of the space, with little degradation
- Diamond introduces Rio MP3 player (1998)
- People start space shifting their music
- RIAA starts legal action against Diamond
- U.S. Court of Appeals: space shifting is a fair use





# Kelly v. Arriba Soft Corporation

- Kelly: Photographer maintaining Web site with copyrighted photos
- Arriba Soft: Creates search engine that returned thumbnail images
- Kelly sues Arriba Soft for copyright infringement
- U.S. Court of Appeals: use of images is a fair use



# Google Books

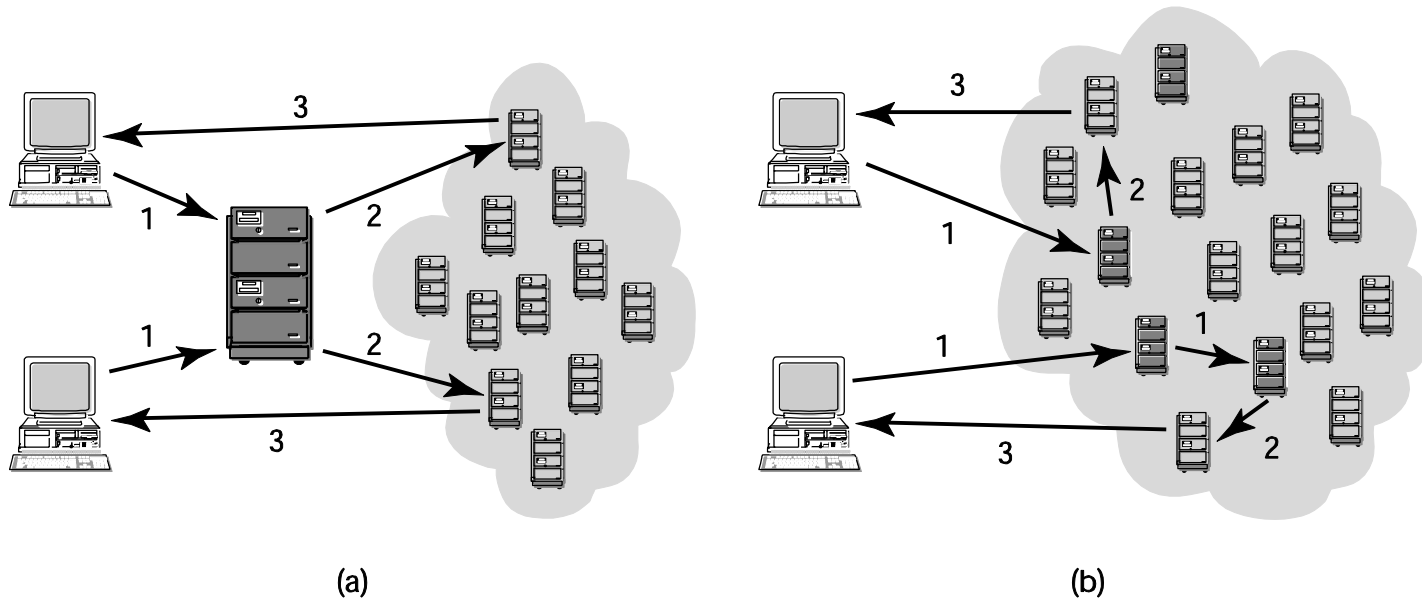
- Google announced plan to scan millions of books held by several huge libraries, creating searchable database
  - If public domain book, system returns PDF
  - If under copyright, user can see a few sentences; system provides links to libraries and online booksellers
- Authors Guild and publishers sued Google
  - They settled, but the settlement was thrown out by a judge
  - Publishers settled again in 2012  
<http://www.nytimes.com/2012/10/05/technology/google-and-publishers-settle-over-digital-books.html>
  - Authors Guild lawsuit still outstanding

# Napster

- Peer-to-peer music exchange network
- Began operation in 1999
- Sued by RIAA for copyright violations
- Courts ruled in favor of RIAA
- Went off-line in July 2001
- Re-emerged in 2003 as a subscription music service

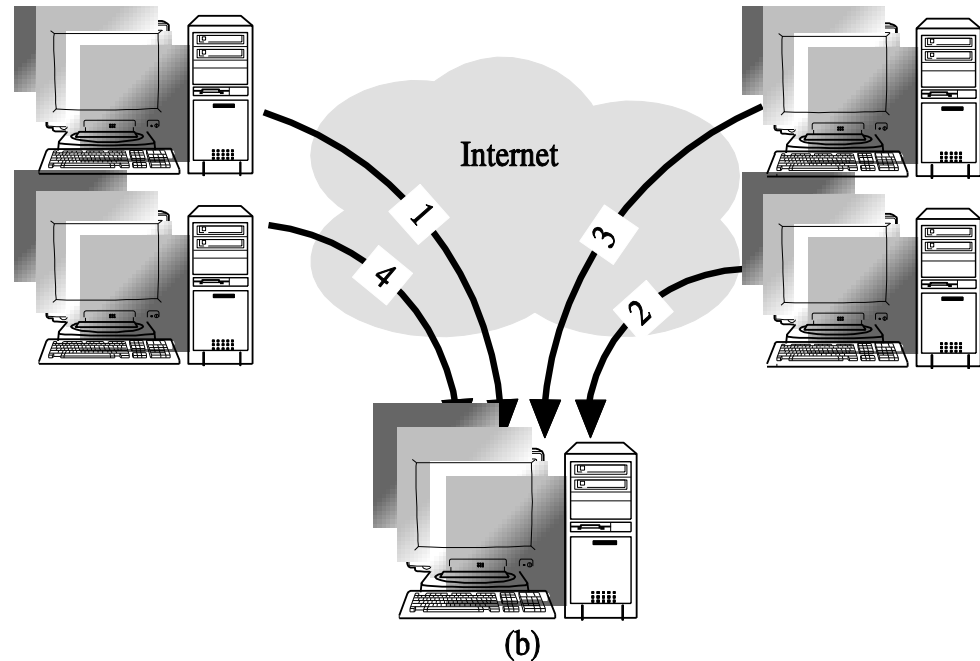
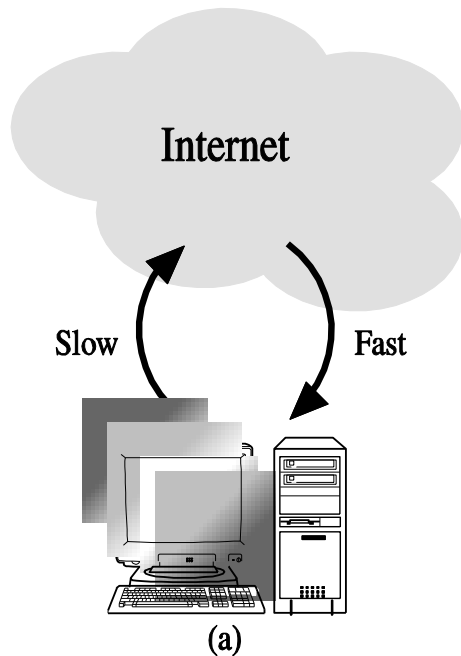
# FastTrack (Kazaa, Grokster)

- Second-generation peer-to-peer network technology
- Used by Kazaa and Grokster
- Distributes index among large number of “supernodes”
- Cannot be shut down as easily as Napster



# BitTorrent

- Broadband connections: download much faster than upload
- BitTorrent speeds downloading
  - Files broken into pieces
  - Different pieces downloaded from different computers
- Used for downloading large files
  - Computer programs
  - Television shows
  - Movies



# 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
- More recently: Pirate Bay...

# Legal Action Against The Pirate Bay

- The Pirate Bay located in Stockholm, Sweden
  - One of world's biggest BitTorrent file-sharing sites
  - People download songs, movies, TV shows, etc.
- After 2006 raid by police, popularity increased
- In 2008 the International Federation of the Phonographic Industry sued four individuals connected with site
  - Defendants said The Pirate Bay just a search engine
  - Swedish court sentenced all four to prison time and fined them a total of \$3.5 million
- Meanwhile, The Pirate Bay still operational
  - Shifted to hosting only “magnet links” (Feb 2012)
  - All servers just moved to the cloud (Oct 2012)

# 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)

# 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

# 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

