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# COMP 3056 Professional Ethics in Computing

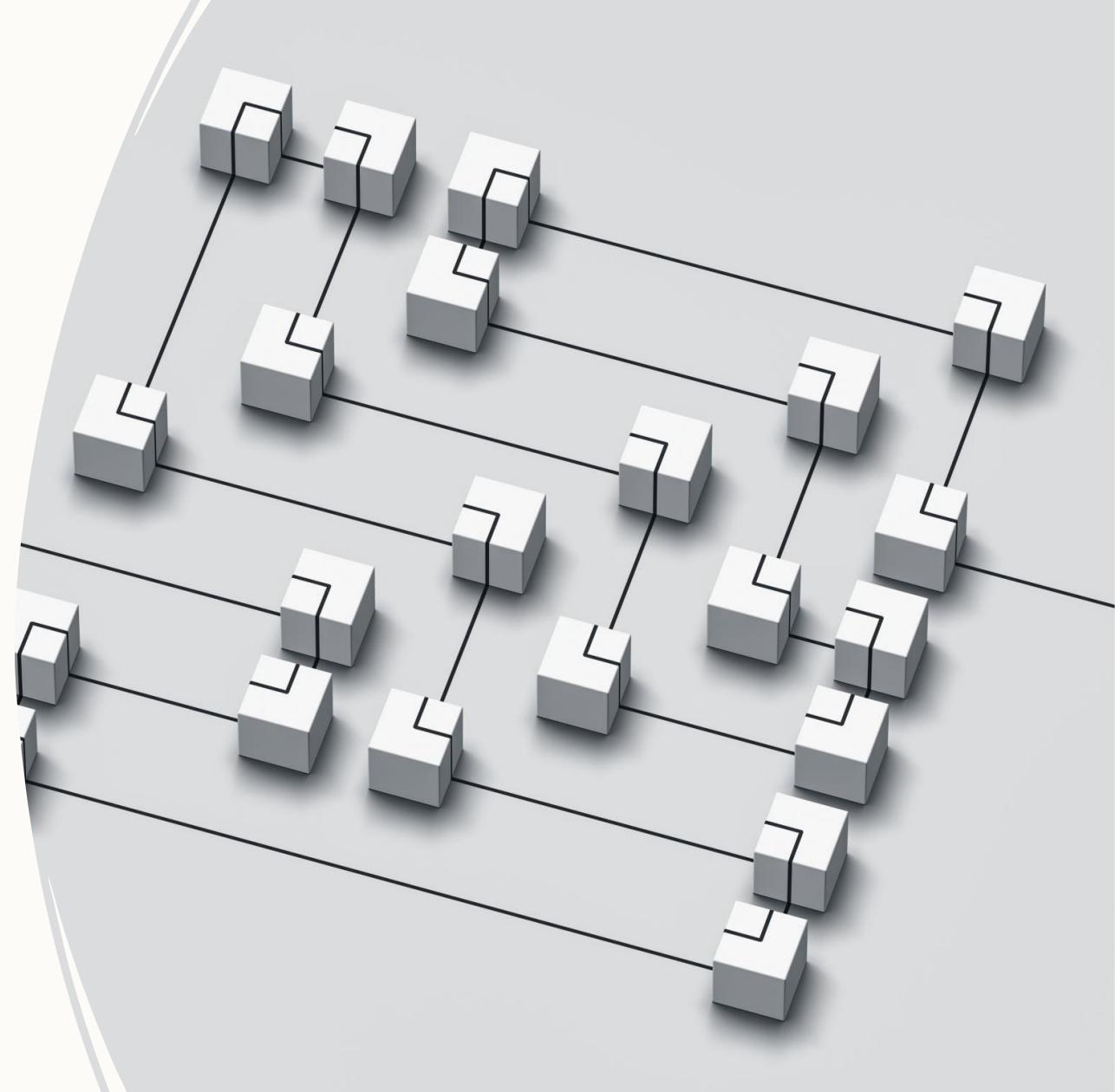
Week 8 Intellectual Property





# Learning outcomes

- Intellectual & Intangible Property
- Copyright
- Patent Law
- Trademark
- Trade Secrets
- IP Protection for Software





# Intellectual & Intangible Property

# Intellectual & Intangible Property

- The **products of creation and invention** (e.g., a book, a musical composition, computer software...) **are typically called “*intellectual*” property** to distinguish them from ***tangible*** property (e.g., a house, a car, a pair of shoes...)
- Today, we look at:
  - *Types of intellectual property* that are most affected by ***computing and the Internet***
  - *New types of intangible property* that arise due to computing, but ***do not seem creative*** in nature

# Additional Reading

- Chapter 4 of the book Ethics in a Computing Culture (Brinkman and Sanders, 2013)
- Chapter 4 of the book A Gift of Fire (Baase, 2013)
- Chapter 3 of the book Ethics for the Information Age (Quinn, 2013)
- Chapter 8 of the book Ethics and Computing (Bowyer, 2001)
- Legally Speaking Mass Digitization as Fair Use. Pamela Samuelson, Communications of the ACM, Vol. 57, No. 3, pp. 20-22, March 2014.
- Does the Patent Office Respect the Software Community? Gregory Aharonian, IEEE Software, pp. 87-89, July/August 1999.

# The basic idea / argument...

- The importance of creativity and invention
  - *Protecting innovators and their creation*
- Ultimately to encourage innovation
  - But *does the opposite happen?*
- Defining *intellectual* and *intangible* property
  - Intellectual property often shortened to **IP**

# (Intellectual) Property of Ideas

*"If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of everyone, and the receiver cannot dispossess himself of it."*

[Thomas Jefferson, 1813]

*President, Inventor, and Founding Father of USA*

- hailed as the author of the *Declaration of Independence*

# Intellectual Property (IP) Law

- To ensure that people with **good ideas** can **profit** from them
  - even once the idea is known to everyone
- To **encourage** people to get involved in **creative arts** and **invention**
  - for the benefit of everyone
- IP Law is very complicated...
  - *I know this first hand!*
- We focus on three key aspects that directly affect computing
  1. Copyright
  2. Patent
  3. Trademark

# IP Protection: 5 Key Questions

- For each type of IP protection, we ask:
  1. *What type of thing can be protected?*
  2. *What rights are reserved for the creator of the work?*
  3. *What rights are reserved for the public?*
  4. *How does one obtain protection for a work?*
  5. *How long does the protection last?*

# The Numbers: China

- China: Intellectual Property Rights - Protecting assets in the information, communications and entertainment market. The Economist, HK, 2005  
<https://www.kpmg.com/CN/en/IssuesAndInsights/ArticlesPublications/Documents/China-Intellectual-Property-Rights-200502.pdf>
- The added value of China's patent-intensive industries topped 10.7 trillion yuan (\$1.51 trillion) in 2018, contributing 11.6 percent to the country's GDP (reported 2020).  
[https://english.www.gov.cn/statecouncil/ministries/202003/26/content\\_WS5e7c056cc6d0c201c2cbf7bd.html](https://english.www.gov.cn/statecouncil/ministries/202003/26/content_WS5e7c056cc6d0c201c2cbf7bd.html)
- International integration:  
[THE 5 BIGGEST CHINA IP STORIES OF 2021 | Insights | CBBC](#)

**HOMEWORK:** what is the current situation?



# Copyright

# Copyright

- Main mechanism for **protecting creative works**, e.g., art, music, & literature
- US Law **DOES PROTECT:**
  - “*Original works of authorship fixed in any tangible medium of expression*” (Title 17, US Code section 102) in the areas of literature, music, drama, pantomime, graphic art, sculpture, motion pictures, sound recordings, and architecture
- US Law **DOES NOT PROTECT:**
  - Ideas, facts, or common knowledge
  - Creative works that are not in a “tangible” fixed form
    - E.g., dance choreography: to protect work, choreographers often make video recordings of dance during rehearsal
- No “*process*” to obtain copyright – works created are **automatically protected once they appear in a fixed medium**
- Duration – (Currently) Lifetime of the author + 70 years
  - When Old, Out-of-Copyright Art Becomes Free Art

# Four main rights for the author

1. The right to reproduce the copyrighted work
2. The right to prepare derivative works based on the copyrighted work
3. The right to distribute copies of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending
4. The right to perform or display the copyrighted work publicly

# Rights for the public

- Most activities **not covered** by four main **rights of the author** belong to the public.
  - E.g., if you own a DVD, you have right to display privately in own home
- There are two main rights reserved for public that deserve special attention:
  1. **Fair Use**
  2. **First Sale**

# Fair Use

- We can, in certain situations, use parts of copyrighted work without express permission
- Following are **not** an infringement of copyright:
  - Criticism
  - Comment
  - News Reporting
  - Teaching (inc. multiple copies for classroom)
  - Research

# Factors of Fair Use

- Law does not give clear rules
- Four factors considered by court /arbitrator for each case:
  1. Purpose and character of use
    - e.g., commercial vs. non-profit educational
    - noncommercial and educational more likely to be fair
  2. Nature of the copyrighted work
    - e.g., fiction vs. nonfiction, published vs. non-published
    - use of nonfiction work & published work more likely to be fair
  3. Amount and substantiality of used material
    - relative to the copyrighted work as a whole
    - short extracts more likely to be fair, but **not if substantial**
  4. Effect of use on potential market for, or value of, the copyrighted work
    - use more likely fair if copyright holder's ability to make money is not damaged

**Not fair use:** although apple and face is a small part of original work, it is a vital or recognisable part, and therefore *substantial*



*The Son of Man* (1964), René Magritte

[https://en.wikipedia.org/wiki/The\\_Son\\_of\\_Man](https://en.wikipedia.org/wiki/The_Son_of_Man)

# Scenario

- Prof. Smith wants to provide students with a chapter of a textbook (not authored by him) as supplementary material on a module. Smith posts a PDF file of the chapter and posts it in a public website. **Qu: Is this fair use?**
- What if Smith places on a password-protected site for students only? **Qu: Is this fair use?**
- What if Smith takes a chapter from one book, another chapter from another book, etc. and posts all on a password-protected site for students. **Qu: Is this fair use?**

To consider: Purpose of use (education), type of work (non-fiction), amount / substantiality, effect on market/ value

# Doctrine of First Sale

- Copyright Law:
  - Designed to protect something *intangible* (i.e. an *expression* of creativity)
  - Until recently, copyrighted material was purchased in *tangible* form
    - Right to listen to music recording: purchase physical record, or CD
    - Right to read a novel: purchase printed copy of the book
  - This creates confusion in minds of consumers—it's natural to think same set of rules (about resale and copying) apply to CDs and books as to shovels, **but that is not the case...**
- Consider a textbook you have purchased
  - If you purchased a new copy, then the authors (copyright holders) received a royalty of what was paid
  - Now, if you sell it back to bookstore and they resell it as a used book, do authors get a second royalty?

## Doctrine of first sale: No second royalty

- Copyright holders are **not** entitled to a second royalty from resale
  - “*The owner of a particular copy ... lawfully made under this title ... Is entitled, without the authority of the copyright owner, to sell or otherwise dispose of the possessions of that copy*”
  - i.e., you are free to sell your book without involving the copyright owner ***as long as no new copy is made***
  - This policy (created 1908) was workable ...
    - until books shifted to e-books and CDs shifted to MP3s
    - then, first sale may no longer make sense
    - The reason? Modern copyright protection schemes, collectively called “digital rights management”

# Digital Rights Management (DRM)

- Many consumers now buy music, novels, electronically on the Internet
  - You no longer receive physical product
  - You get a virtual computer file that can be played on different devices
- Digital Right Management (DRM):
  - Technologies that work to ensure copyrighted content can only be viewed by the purchaser
  - When you purchase content it is locked to your device
  - ebook purchased for your Amazon Kindle cannot be read on your friend's Kindle
- What happens to Fair Use and Fair Sale rights? (e-book with DRM)
  - You may not be able to cut and paste a quote from a book [**can't exercise right to fair use**]
  - You cannot give copy to friend and then delete your copy [**can't exercise right to resell a book – i.e., doesn't meet first sale doctrine**]

# Digital Millennium Copyright Act (DMCA)

- Law updated to deal with modern copyright issues (1998)  
*No person shall circumvent a technological measure that effectively controls access to a work protected under this title*  
(Title 17, US Code, section 1201)
- Law has been criticised on grounds that it ***makes fair use and fair sale legally impossible***
- Copyright law gives public rights to fair use and fair sale...
  - But can only be exercised by breaking DRM system
  - And breaking DRM is illegal under DMCA

# Plagiarism vs. Copyright Violation

- Posner's definition of plagiarism
  - *"copying that the copier claims is original with him and the claim causes the copier's audience to behave otherwise than it would if it knew the truth"*

**Scenario:** Student Alice pays student Bob to write an essay on her behalf. Alice hands in the essay as her own work with the express permission of Bob.

## Q: Copyright infringement, plagiarism, both, neither?

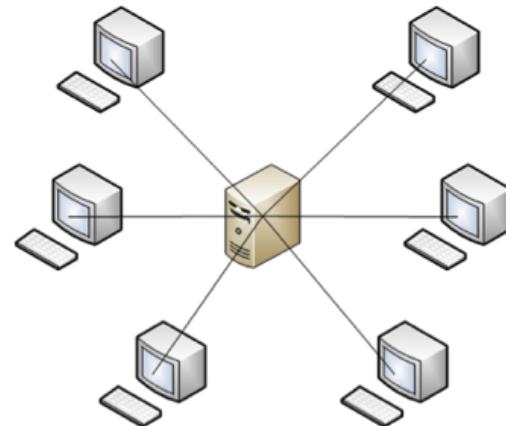
- *This is plagiarism* – copier, Alice, claims it is original, and marker would discipline/fail Alice if truth was known
- *This is not copyright infringement* – Bob gives Alice permission to use
- Plagiarism does not necessarily imply copyright infringement
- & Vice-versa: We can violate copyright by publishing a photograph on our website, even if we give credit

# Sharing vs. Selling

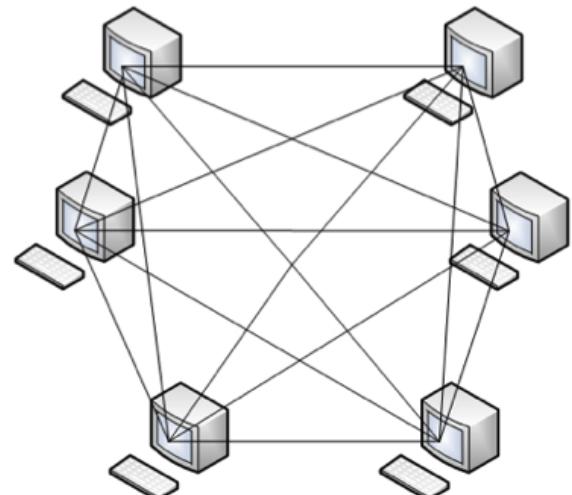
- Until 1990s, copyright piracy involved counterfeiting—illegal duplication of physical media
- Infringement through sharing (e.g., let a friend use your disk to illegally install software) had relatively small business impact (original purchase shared with relatively few friends)
- The internet allows a single legal copy to be shared with thousands/millions of people
- Example case: 1994—MIT Student charged with criminal copyright infringement
  - Allegedly hosting copyrighted software (e.g., Excel) on his website for free download
  - Verdict: no copyright violation
  - Law said criminal only if the act was “for the purpose of commercial advantage or private financial gain”
  - No private or financial gain, therefore infringement not a criminal offense
- Result: 1997 – No Electronic Theft Act (or NET Act)
  - Copyright law amended, so “financial gain” includes receiving copyrighted works for free
  - Now swapping (I’ll give you movie A if you give me movie B) is clearly illegal

# P2P Sharing & Searching

- Post a whole movie on a website?
  - **Legal? Moral?**
  - Probably not
- What about P2P software?
  - No central server
  - Search only – provider helps you search for files on the network – this is hard problem (would not be possible without software application)
  - No hosting from the service provider
    - **Legal? Moral?**
    - ?



A server based network opposed to peer-to-peer



A peer-to-peer network.



- The first P2P file-sharing software
  - 80 million users at its peak
  - College dorms: 61% of external traffic was MP3 file transfers!
- Found guilty of violating copyright law
  - Despite not hosting any copyrighted material – **correct decision?**
- Defined as "**Contributory Infringement**"
  - Infringement would not have happened without Napster's help
- There is also "**Vicarious Infringement**"
  - Infringement occurred in an area under Napster's supervision
- Numerous examples since: The Pirate Bay, BitTorrent, etc...
  - Napster: <https://en.wikipedia.org/wiki/Napster> **Very interesting read!**
  - The Pirate Bay: [https://en.wikipedia.org/wiki/The\\_Pirate\\_Bay](https://en.wikipedia.org/wiki/The_Pirate_Bay)
  - BitTorrent: <https://en.wikipedia.org/wiki/BitTorrent>

# Copyright Duration

- Debate: how long should copyright protection last
  - Term has grown steadily over time
  - Since 1998—it is author's lifetime, plus 70 years.
- Arguments for long term:
  - To support author and family for life
- Arguments against very long term:
  - Difficult to track down owner (orphaned work)
  - Social cost: students read Shakespeare at school – what would be annual cost be if works still in copyright!?



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# Patent Law

# Patents: Definitions

- Intellectual works of invention, value is on its usefulness
  - Covers processes, machines, manufacture, compositions of matter, ...
  - Capable of being made or used
- Need to apply for it
  - Can be expensive process (more than \$10,000)
- Criteria, invention must be:
  - Novel (not been invented before)
  - Non-obvious (not obvious to another specialist in appropriate area)
- Valid for some fixed period of time
  - (usually 20 years from application date)
- Good investment! No-one can make, use, offer to sell, or sell the invention without the patent holder's permission!

# Patent Wars!



## Samsung vs Apple Patent Wars: Apple Wins \$120 Million Slide-to-Unlock Patent Case

7 October 2016, 8:48 pm EDT By Vamien McKalin Tech Times



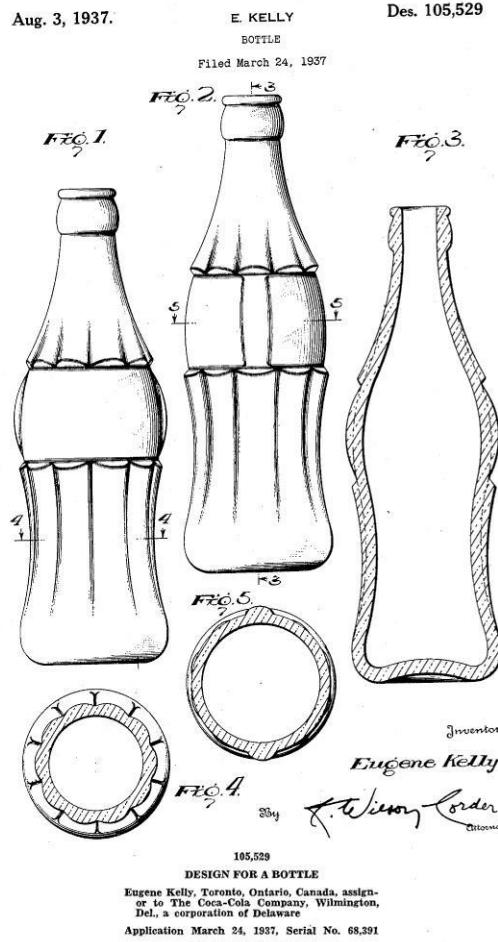


# Trademark

# Trademarks: Definitions

- Legal registration of word, phrase, symbol, or item that identifies product, service or corporation
- **Trademark vs. Brand:**
  - Brand refers to the product's identity as a whole
  - Trademark refers to specific element of identity elements
- Usually used to protect word or logo related to a product, so that consumers can be sure products are authentic
- Can register trademark for identifying characters of brand, e.g.,
  - **Colours:** T-Mobile holds trademark for colour magenta
  - **Sounds:** Motorola holds trademark on the “Chirp” sound phones make when using direct-connection technology
  - **Shapes:** Coca-cola holds trademark on “*bottles, jars, or flasks with bulging, protruding or rounded sides*”

# Trademarks: Shapes & Colours



To all whom it may concern:

I, Eugene S. Kelly, a citizen of the United States and resident of Toronto, Province of Ontario, Dominion of Canada, have invented a new, original, and ornamental Design for a Bottle, of which the following is a specification, reference being had to the accompanying drawings forming part of this application.

Fig. 1 is a side view of my bottle.

Fig. 2 is likewise a side view, showing the bottle in Fig. 1 turned through an arc 90°, in order to better illustrate certain features of the instant design.

Fig. 3 is a vertical cross-sectional view of my bottle taken substantially along the line 3-3 of Fig. 2.

Fig. 4 is a horizontal cross-sectional view taken along the line 4-4 of Fig. 1.

Fig. 5 is likewise a horizontal cross-sectional view, taken along the line 5-5 of Fig. 2.

I claim:

The ornamental design for a bottle, as shown.

EUGENE KELLY.

## The Switch

# Court says T-Mobile owns the color magenta

By Brian Fung February 10, 2014 [Email](#)



# Trademark

- In order to receive TM, you must already be using the mark to represent product or service
- Can register for fee of few hundred dollars
- TM lasts 10 years but can be renewed indefinitely
- As long as you own trademark, no one else can use it in a way that is likely to cause confusion among customers
  - E.g., no other mobile phone company can adopt magenta as company colour, but a soft-drink can could use magenta
- **Trade dress**—look and feel of a product and its packaging
  - Several companies have attempted to use trade dress protection to prevent others from copying look and feel of their Web sites



# Trade Secrets

# Trade Secrets

- With some products it is possible to keep the intellectual “idea” secret
  - E.g., an Internet company’s search algorithm
  - E.g., Coca Cola’s secret recipe
- Such secrets are called “trade secrets”
  - They are secrets that are fundamental to business
    - E.g., Customer delivery information for fresh chicken supplier [Faccenda]  
<http://uk.practicallaw.com/books/9781845920418/chapter06#BBECI-ch06-UID42>
    - E.g., Chemical database for mosquito net manufacturer [Vestergaard]  
<https://www.rpc.co.uk/perspectives/ip/vestergaard-guarding-trade-secrets>
- IP laws are not needed to protect trade secrets
  - If somebody breaks into company and steals the secret, they can be prosecuted for trespassing
  - Employees can be prevented from leaking secrets through use of non-disclosure agreements in their employment contracts
- IP laws needed only for inventions/creations that are *no longer secret*



# IP Protection for Software

# IP Protection for Software

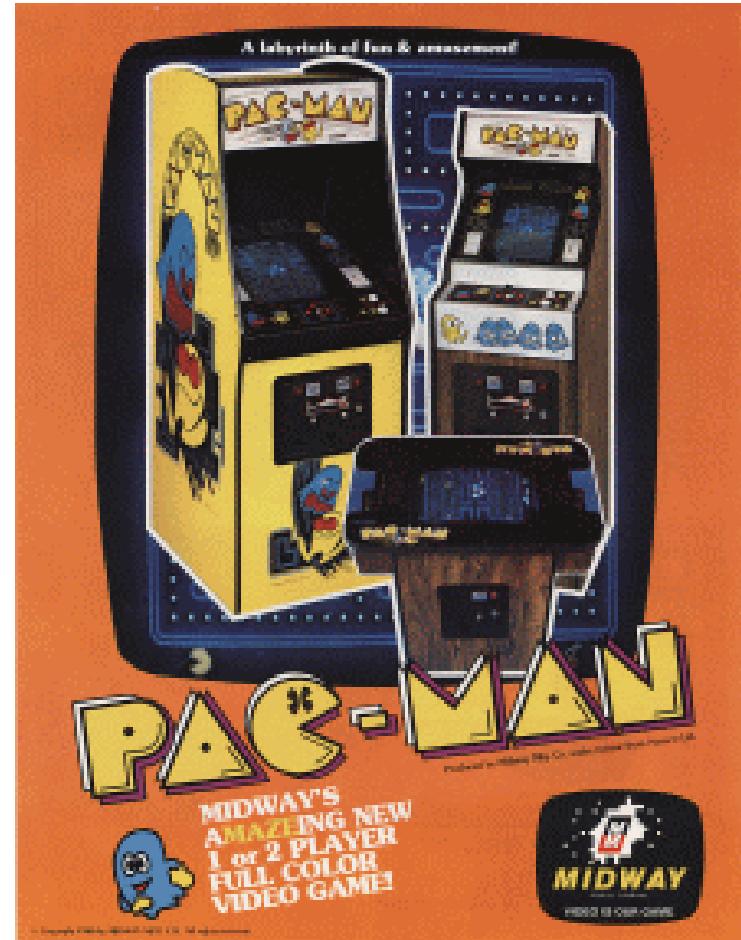
- Copyright, Patents, and Trademark can be used to protect parts of a computer software product, e.g.,
  - source code logic,
    - Source code is a creative work of authorship and is copyrighted
  - look and feel, e.g.,
    - Pac-Man Copyright – arcade software, work of creativity
    - Blue Nile Trademark – trade dress law for jewelry website
  - features, (E.g., Apple's *Slide-To-Lock* Patent)
  - algorithms, (E.g., Google's *Page Rank* Patent)
- It is *not* a simple question of how to protect software

# Copyright & Trademark Protection for Software

- Copyright used to protect parts of computer program that are works of creative authorship, e.g.,
  - source code logic
  - Look and feel of whole game (e.g., Pac-Man)
- Trademark used to protect parts of program that uniquely identify it, and make it distinctive, **for the purposes of commerce**
  - E.g., BlueNile.com jewelry store sued Ice.com jewelry store for allegedly copying look and feel
- Notice, both copyright and trademark can be used (in some circumstances) to protect look and feel, e.g., Pac-Man

# K.C. Munchkin vs. Pac-Man

- First there was Namco's 1980 arcade game *Pac-man* (see, right)
- Atari exclusively licensed to produce the first play-at-home version of *Pac-Man* (released 1982)
- Philips produced a clone of *Pac-man* (not a direct copy)—*K. C. Munchkin*—released in 1981 (i.e., before Atari's release)
- Atari took Philips to court—won **copyright infringement** on “*look and feel*” of the software



# K.C. Munchkin vs. Pac-Man



[https://en.wikipedia.org/wiki/Munchkin\\_\(video\\_game\)](https://en.wikipedia.org/wiki/Munchkin_(video_game))

# K.C. Munchkin vs. Pac-Man

K.C. Munchkin vs. Pac-Man



**K.C. Munchkin!**  
**Magnavox Odyssey<sup>2</sup>**



**Pac-Man**  
**Atari 2600**

# Notes of Software Copyright

- Software copyright:
  - Work can be licensed to others
  - Copyright can be sold or assigned to others
  - Claims for infringement must be proven in court
  - Copyright in work done as part of a job belongs to the employer
  - All digital media are likely to be subject to copyright
  - Creative commons licenses are like open source licenses for digital media rather than software

# Patents for Software (Critique)

- Use of patents for software and algorithms controversial, consider:
  - Amazon's *1-click* Patent (novel, but *nonobvious?*)
  - Google's *Page Rank* algorithm (novel, but *non-trivial?*)
- **Criticism 1: Patent Office not competent to decide whether software idea is nonobvious**
  - This benefits large corporations over small companies / individuals because of prohibitive costs of patent application
  - Also, difficult to develop new and innovative software, because hard to know if new software is violating one of thousands of existing patents
- **Criticism 2: Using patents to protect an algorithm**
  - You cannot patent a *basic mathematical fact* (it would harm public good)
  - Some algorithms can be viewed as basic mathematical facts (the formulas are simple to write down and can be found on Wikipedia), but perhaps they were hard to discover.

# Notes on Patents for Software

- Complex, contentious area
- Legal protection from others exploiting the invention
- Use of invention can be licensed to others
- Typically protected for up to 20 years
- The essence of the invention is disclosed and published
- Claims for infringement must be proven in court
- But there is no agreement



# Summary

# Summary

- Qu: Which type of intellectual property protection should apply to software?
  - This is a trap!
  - There is no clear or obvious answer
  - The experts disagree
- Possible solution – a new legal framework
  - Difficult to map existing law, designed for tangible goods onto intangible ones

IP Protection	Copyright ©	Patent	Trademark ™
<b>What type of things can be protected?</b>	Creative works (art, music, drama) in a fixed and tangible form	Inventions (processes, machines, etc.) capable of being made or used	Word, phrase, symbol, or item that identifies product, service or corporation
<b>Rights for the creator?</b>	<ol style="list-style-type: none"> <li>1. reproduce</li> <li>2. derive new works</li> <li>3. distribute copies</li> <li>4. perform publicly</li> </ol>	Exclusive rights to make, use, and sell	Exclusive rights to use TM
<b>Rights for the public?</b>	<p>Rights not covered by author rights, plus:</p> <ol style="list-style-type: none"> <li>1. Fair use</li> <li>2. First sale</li> </ol>	Cannot “make, use, offer to sell, or sell” invention without patent holder’s permission	Cannot use TM in a way that is likely to cause confusion to customers
<b>How to obtain protection?</b>	Automatic protection, once works appear in a tangible fixed medium. Cost: free	<p>Must apply to Patent Office and meet criteria:</p> <ul style="list-style-type: none"> <li>• novel &amp;</li> <li>• non-obvious</li> </ul> <p>Cost: \$10,000+</p>	Register TM, but must already use mark to represent product or service. Cost: few hundred dollars
<b>How long does protection last?</b>	(Current protection is) lifetime of author + 70 years	Usually 20 years from application	10 years, can be renewed indefinitely

# Workshop

- Mock IP Court Case.

