

Software and Licences

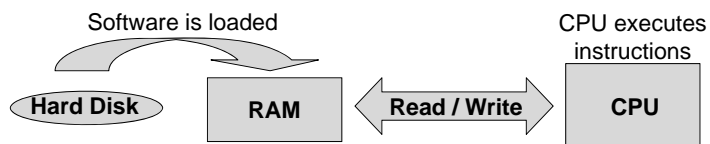
Lecture 3 - COMPSCI1111/111G SS 2016

Today's lecture

- ▶ Describe what software is
- ▶ Understand the legal protections for software
- ▶ Understand different software licences
- ▶ Identify different kinds of software

What is software?

- ▶ Aka 'programs' or 'apps'. Instructions and other data used by the computer
- ▶ User can perform tasks and interact with the hardware through software
- ▶ Loaded from secondary memory into primary memory, where it is executed by the CPU




Kinds of software

- ▶ System software:
 - ▶ Operating system (eg. Windows, Mac OS X)
 - ▶ Device drivers
 - ▶ Diagnostic and maintenance tools (eg. Disk Cleanup)
- ▶ Application software:
 - ▶ Used by users to perform tasks on the computer

File formats

- ▶ All data on a computer is stored in binary
- ▶ However, a program encodes files in its own way; this is the file format
- ▶ A program will be unable to open a file if it does not understand the file format



```
1 %PDF-1.5
2 %b0a0
3 S 9 obj <<
4 /Length 972
5 /Filter /FlateDecode
6 >>
7 stream
8 x0-NN0c[...M:80zH[...R, [...oG[...o
9 '3a7#*(A&E/0E0cA[...+il'U'...
10 c[...MS*-0[...!
11 0F+tc02.A[...-jaD(<If'10C[...e+...ie: [...-2P[...7.s[...
12 [.../9x[...0[...]
```

The beginning of a file using the PDF format

File extension

- ▶ Used by the Operating System to determine a file's format
- ▶ Eg. the .docx file format opens by default with Microsoft Word

Graphics	.jpg , .png , .gif	Video	.mpg , .avi , .divx
Sound	.mp3 , .wma , .ogg	Programs	.exe , .com , .bat
Text	.txt , .doc	Program Code	.c , .java , .cs , .py

Standards

- ▶ File formats sometimes follow a standard; an agreed way encoding data (eg. webpages used the HTML5 standard)
- ▶ Standards can be:
 - ▶ Open
 - ▶ Published openly
 - ▶ Free to use
 - ▶ Eg. HTML, PDF
 - ▶ Proprietary
 - ▶ Owned by a company
 - ▶ Others can use the standard if they pay for a licence
 - ▶ Eg. MP3

Copyright

- ▶ Software is protected by a range of IP rights
- ▶ Copyright:
 - ▶ Protects the expression of an idea
 - ▶ Copyright Act 1994, s14(1)(a): literary works (includes software) is protected by copyright
 - ▶ s21: author owns the copyright
 - ▶ s111: copyrighted material can be used by others if they have a licence



Patents

- ▶ Patents:
 - ▶ Protect an idea from being copied by others
 - ▶ Patents Act 2013, s11(1): a computer program is not an invention and therefore can't be patented
 - ▶ Exception for software in embedded systems

Kinds of software

Proprietary software

- Owned by an individual or company
- Types:
 - Commercial
 - Shareware
 - Freeware
 - Semi-free (for non-profits)

Open source software

- Freely available
- Anyone can use or edit the software's source code

Proprietary software - commercial

- ▶ Software that a user must purchase to use
- ▶ Examples: Microsoft Office, Adobe Acrobat, SPSS



Proprietary software - shareware

- ▶ User has a trial period in which to evaluate the software, and purchase it if they want
- ▶ **Nagware**: software keeps reminding the user to purchase the full version
- ▶ **Crippware**: software that works with limited functionality until the user purchases it
- ▶ **Freemium**: software with a free tier and paid tier



Proprietary software - freeware

- ▶ Software is free to use but source code is not publically available
- ▶ Freeware can be a **loss leader** or **adware**
- ▶ Some freeware is known as **abandonware**; software no longer maintained but still available



Open source software

- ▶ Software that is free to use and whose source code is public
 - ▶ Anyone can use or modify the source code
 - ▶ Anyone can create a **derivative work** from the source code
- ▶ Open source movement started in the late 1980's and crystallized with the **Open Source Definition**
- ▶ Open source software licences (eg. Apache, GNU) are not as restrictive as commercial software licences

Open source software

- ▶ Examples of open source software



User interfaces

- ▶ Two kinds of user interface
 - ▶ Command line interface (CLI)
 - ▶ Graphical user interface (GUI)
- ▶ Key difference is that a CLI is text-based while a GUI graphically-based

Command line interface

- ▶ User enters text commands to perform tasks
- ▶ Can complete tasks very quickly by combining commands
- ▶ Can be difficult to use the text commands if you don't know or understand them



Graphical user interface

- ▶ User performs tasks using the software's graphical elements (eg. windows, pointers, icons, menus)
- ▶ Generally easy to use, especially for new users
- ▶ Can be inefficient for experienced users, but keyboard shortcuts help to make GUIs more efficient



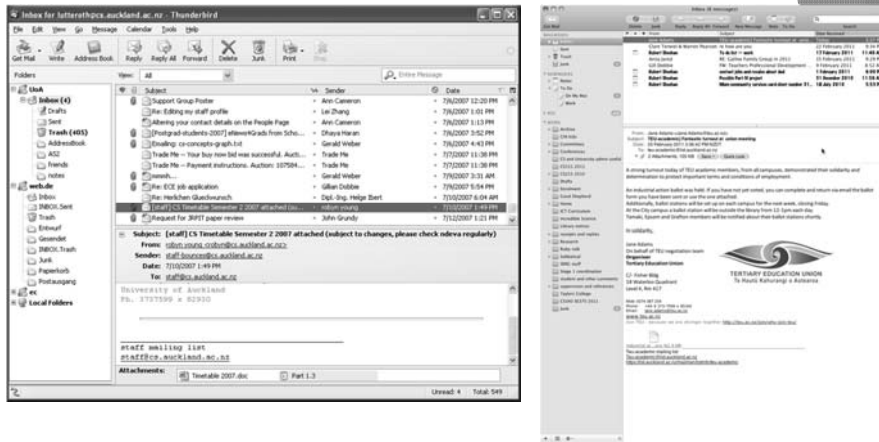
Application software

- ▶ Two kinds of software: system and application
- ▶ Very wide range of application software

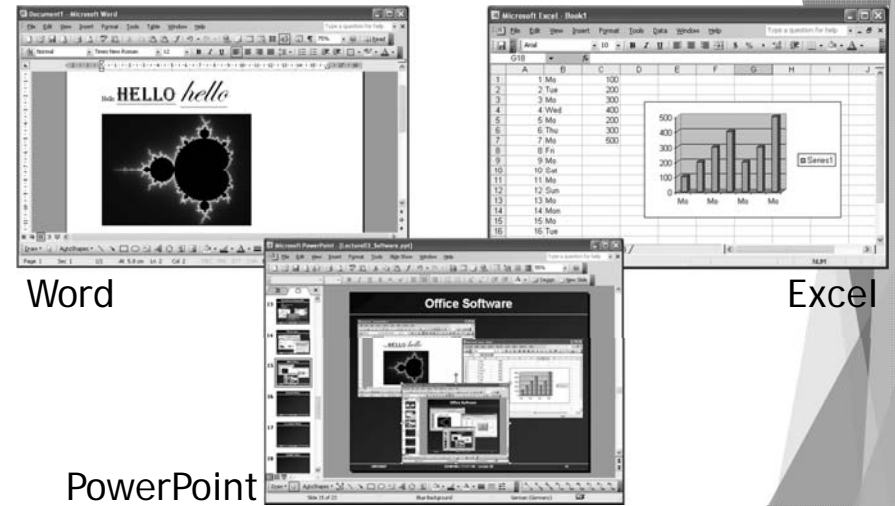
Web browsers



Email clients



Office software

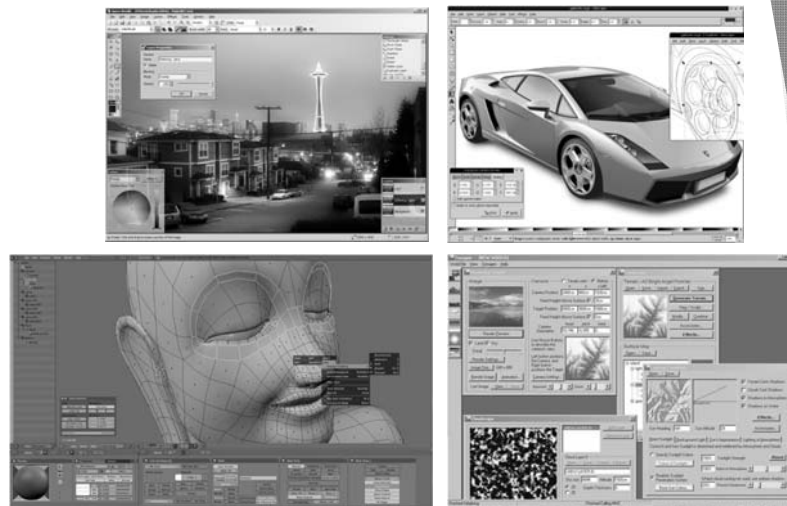


Word

Excel

PowerPoint

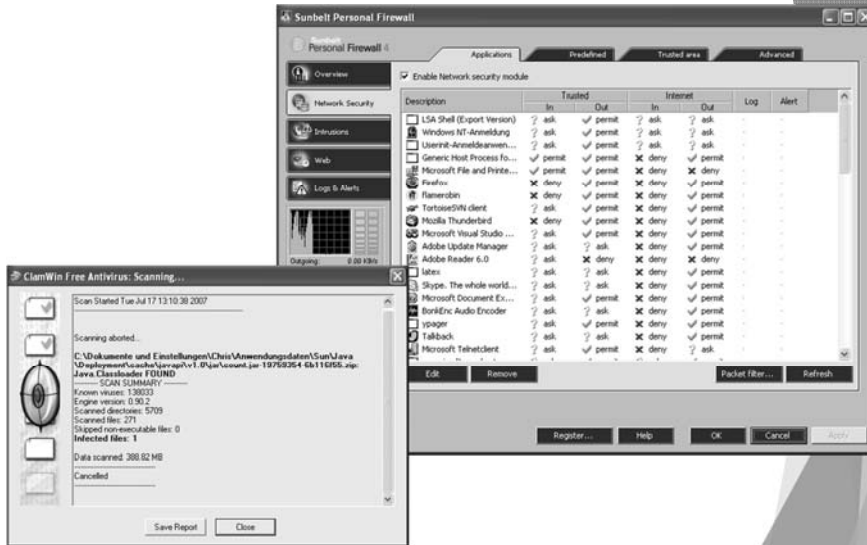
Graphics software



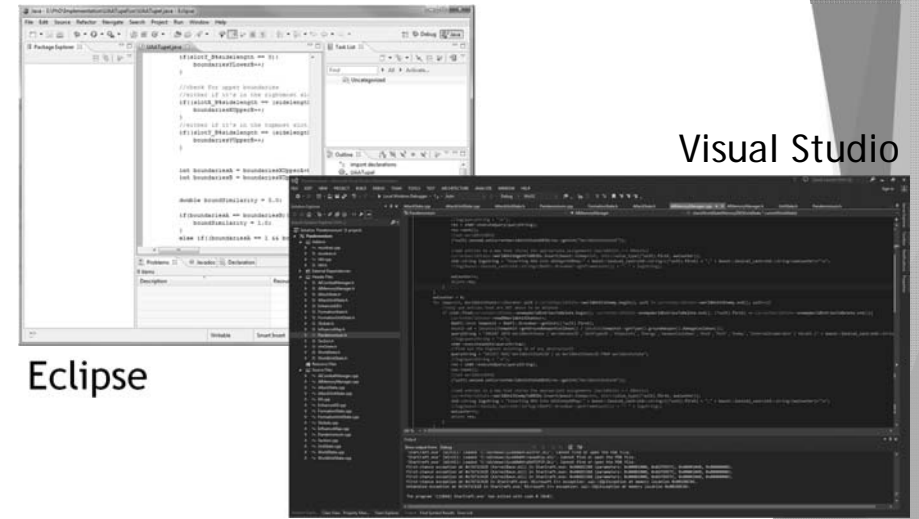
Music software



Security software

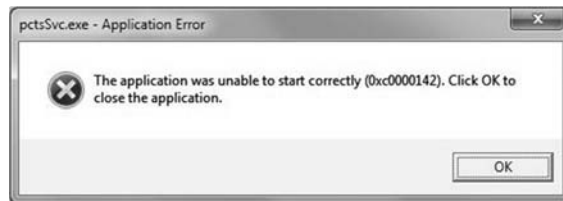


Software development



Software failure

- ▶ Sometimes errors occur in software, they generally can't be fixed but you can:
 - ▶ Google your problem to see if there's a solution
 - ▶ Report the problem to the developer



Malware and viruses

- ▶ Malicious software (malware) can damage a user's computer, data or apps
- ▶ Viruses attach themselves to other programs, where they can cause damage and spread to other computers
- ▶ Protect your computer and data with anti-virus software and a firewall



Summary

- ▶ Software allows users to perform tasks with their computer
- ▶ Software is protected by copyright. Users receive a licence to use software
- ▶ Proprietary software vs open source software
- ▶ CLI vs GUI
- ▶ Different kinds of software can be used to perform different tasks

