Software and Licences

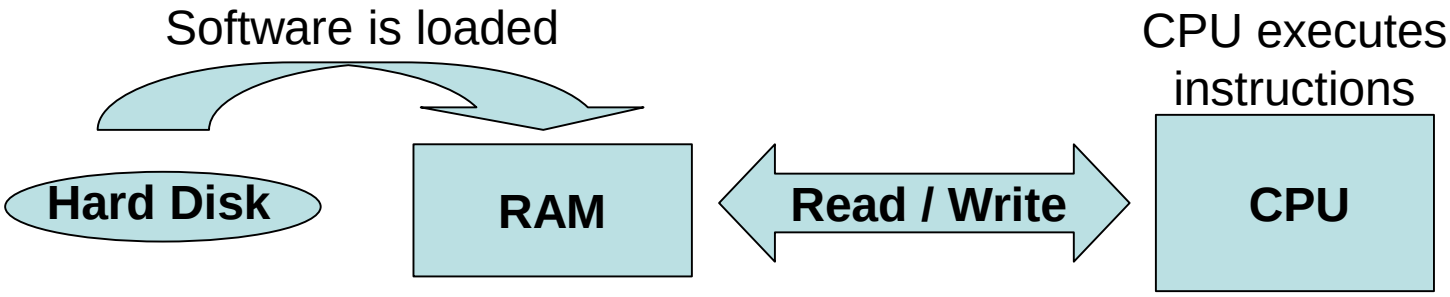
Lecture 3 – COMPSCI111/111G SS 2016

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

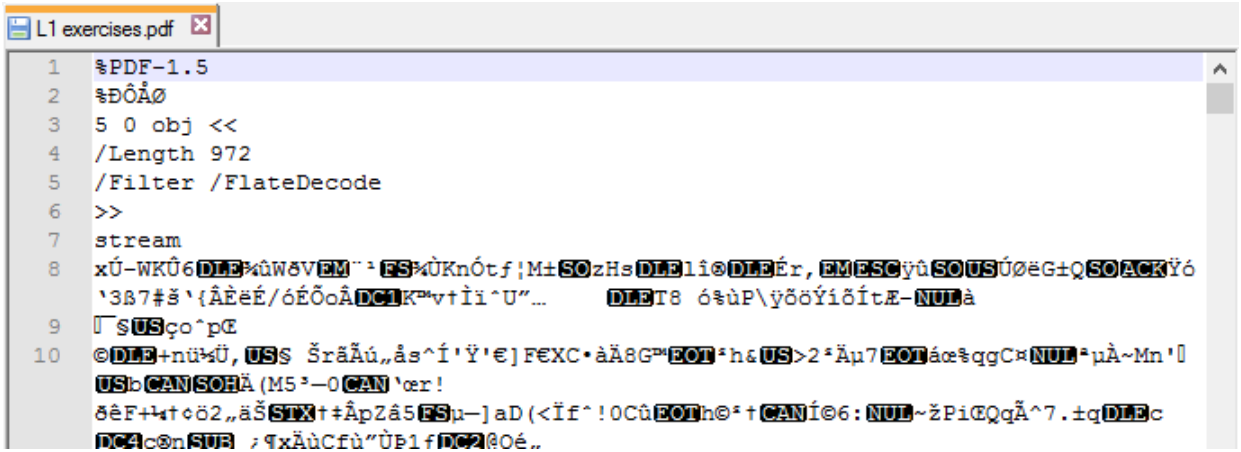


Kinds of software

- 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



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

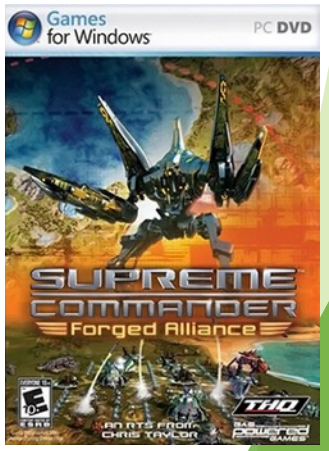
- Software that a user must purchase to use
- Examples: Microsoft Office, Adobe Acrobat, SPSS

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
- **Crippleware**: 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



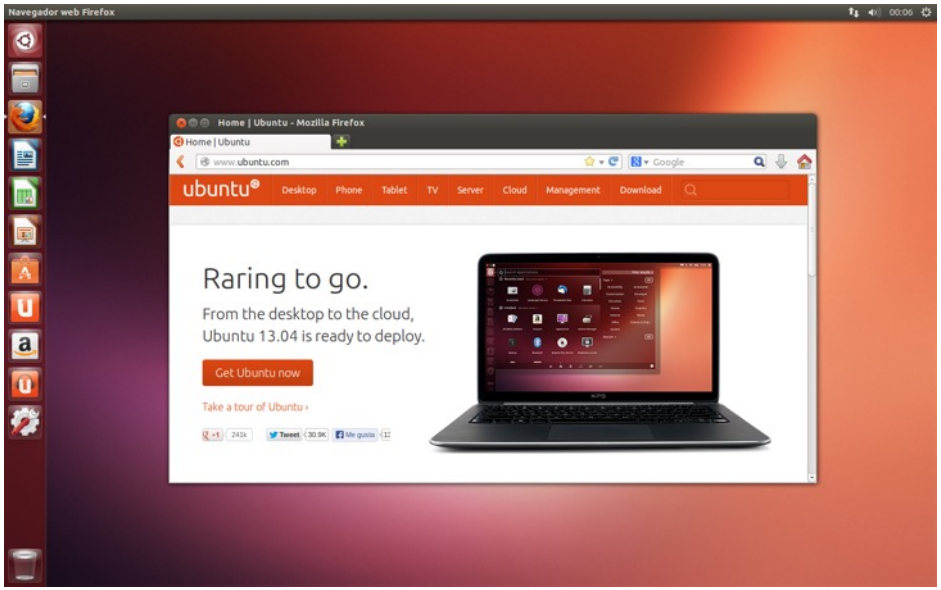
Open source software

- 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

Apache OpenOffice™



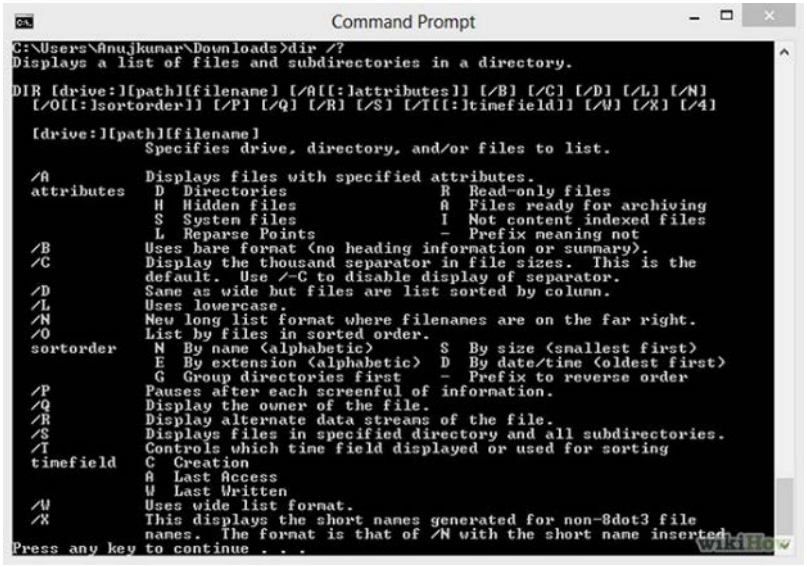
GIMP

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

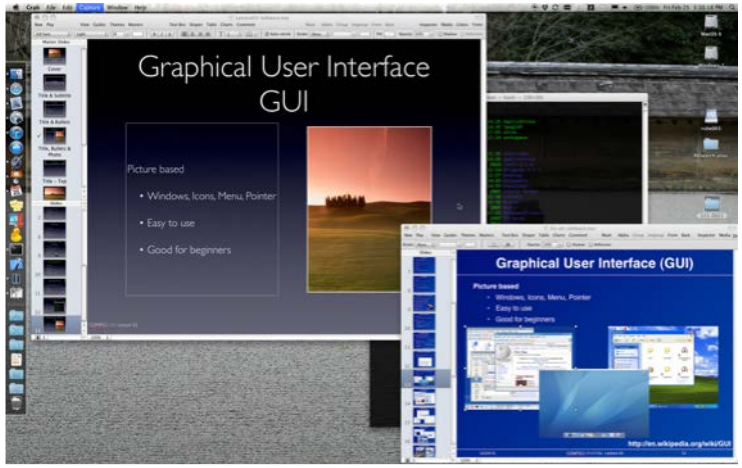
Command line interface

- 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

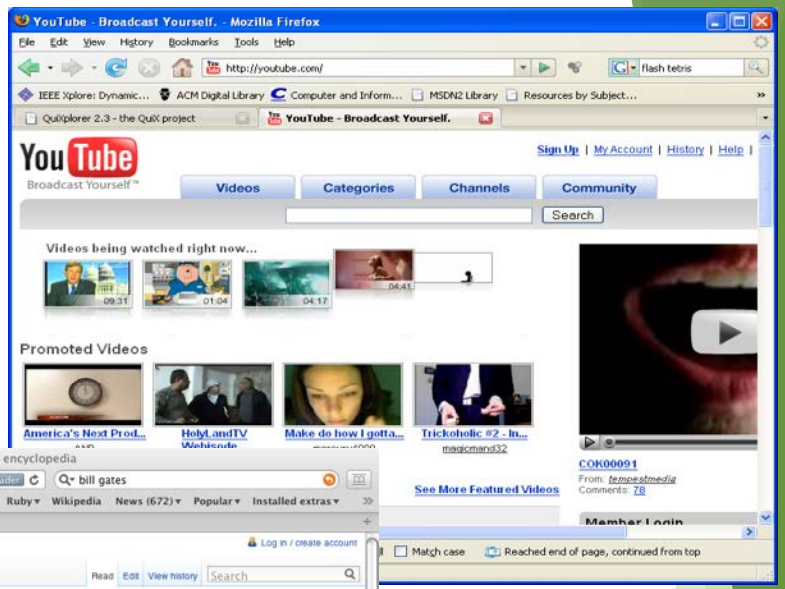
- User performs tasks using the software's graphical elements (eg. windows, pointers, icons, menus)
- Generally easy to use, especially for new users
- Can be inefficient for experienced users, but keyboard shortcuts help to make GUIs more efficient

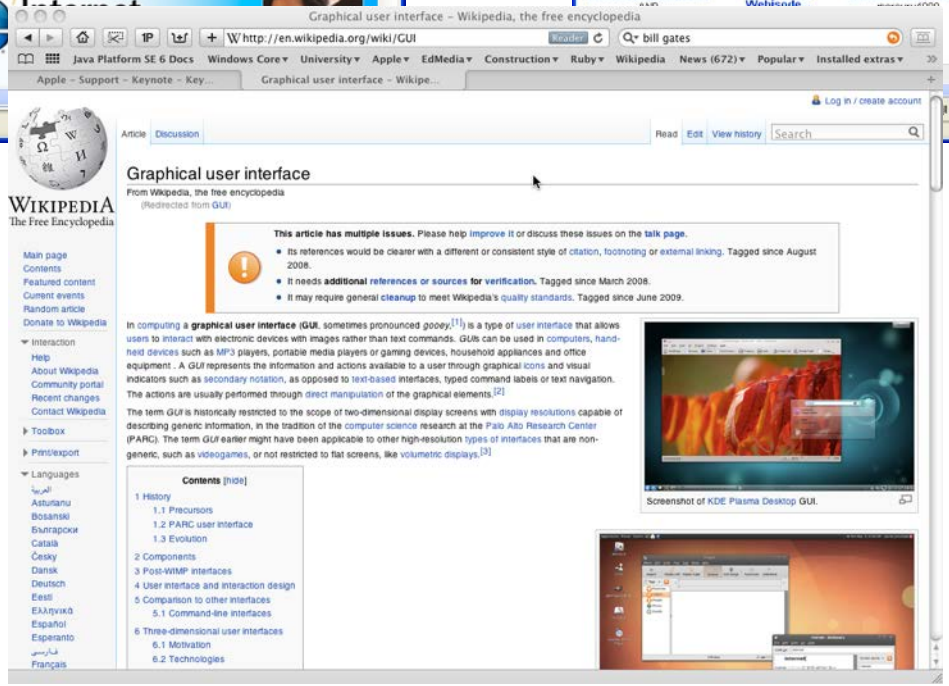


Application software

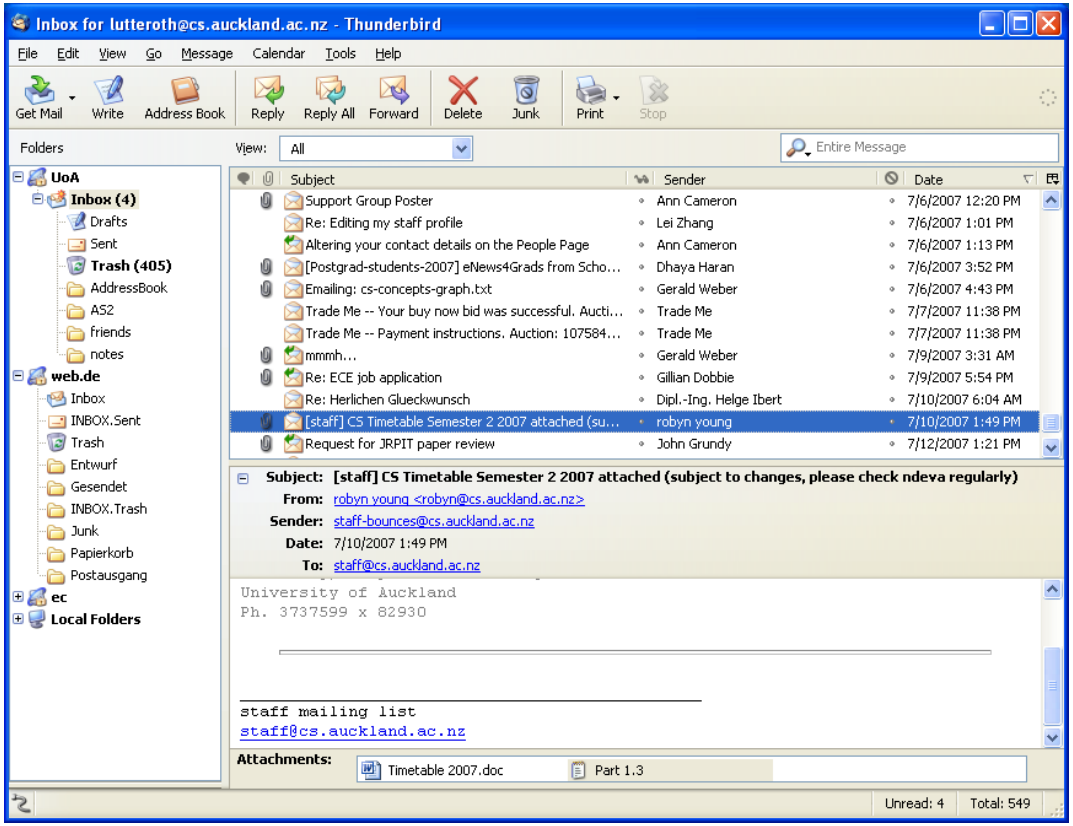
- Two kinds of software: system and application
- Very wide range of application software

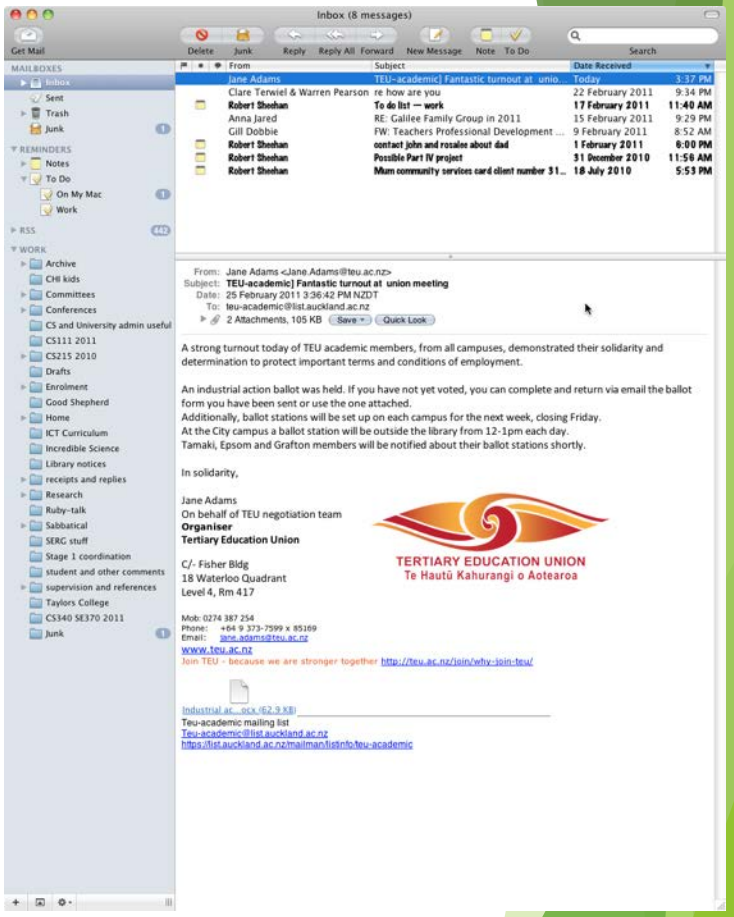
Web browsers



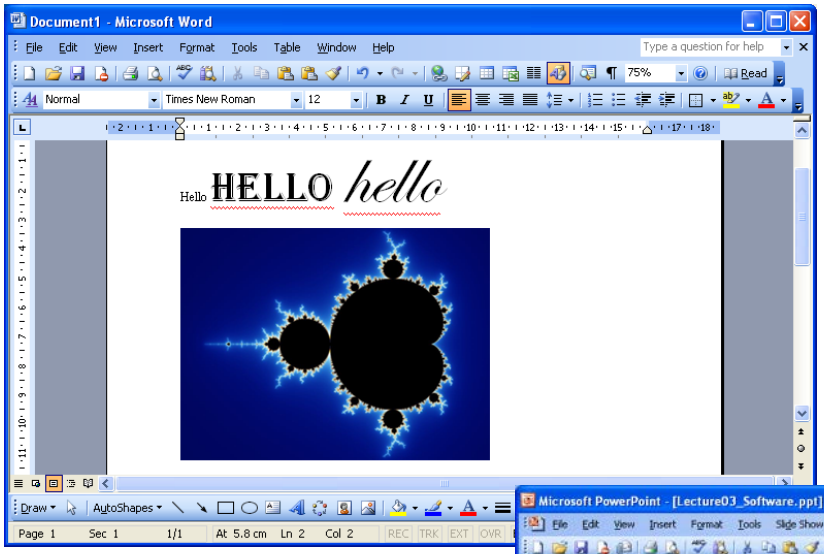


Email clients

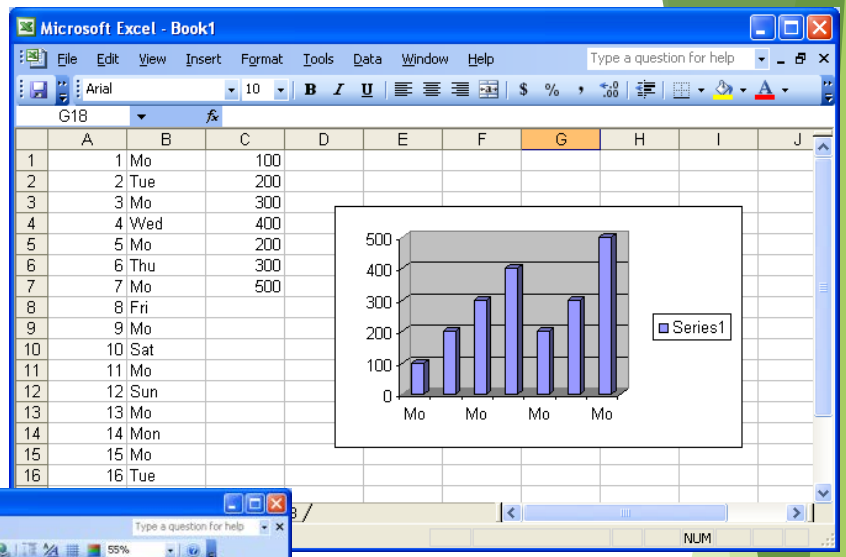




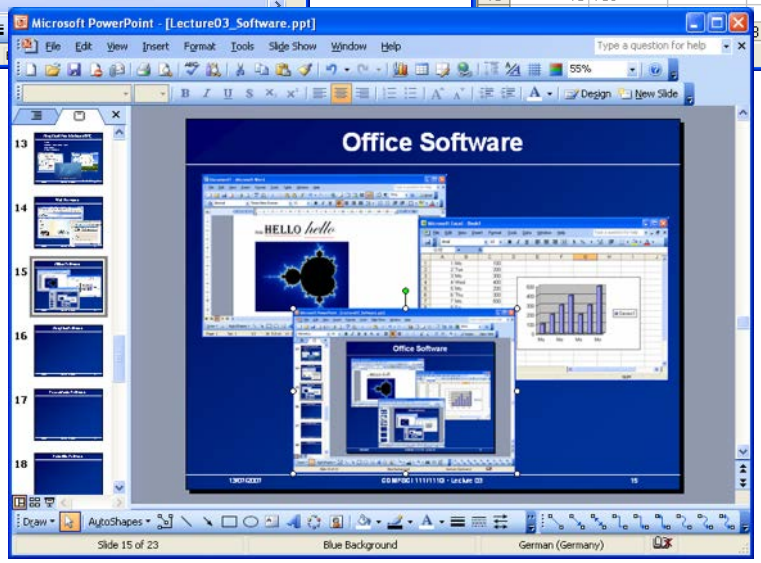
Office software



Word

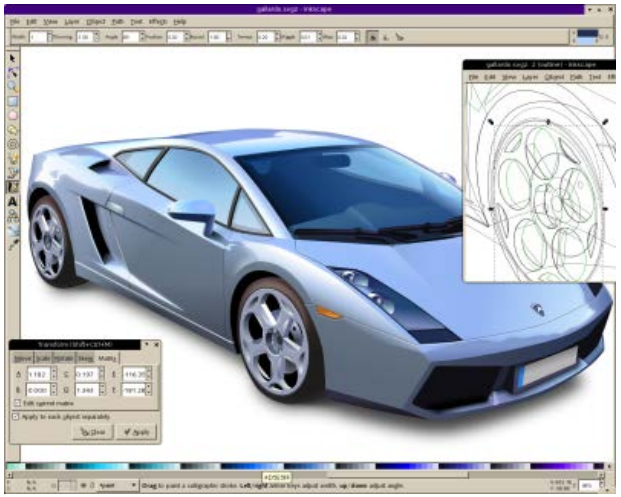


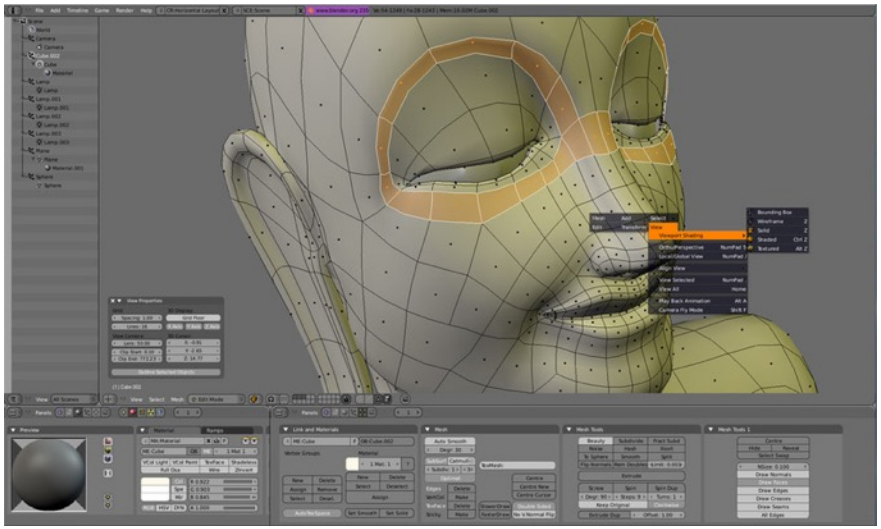
Excel

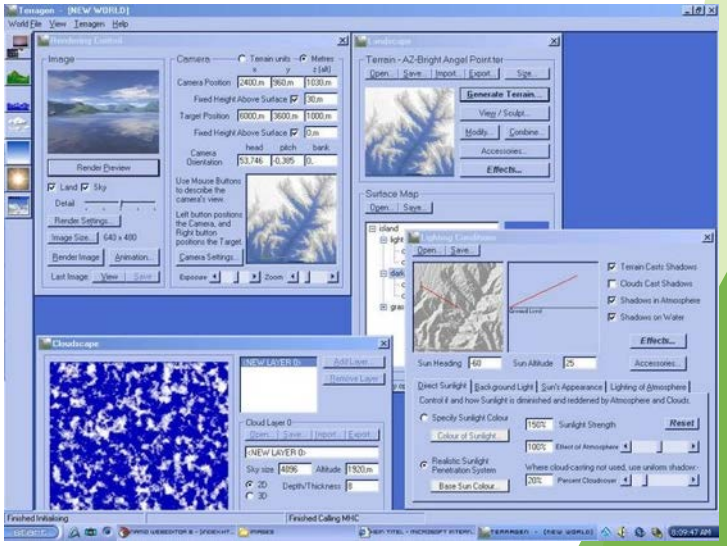


PowerPoint

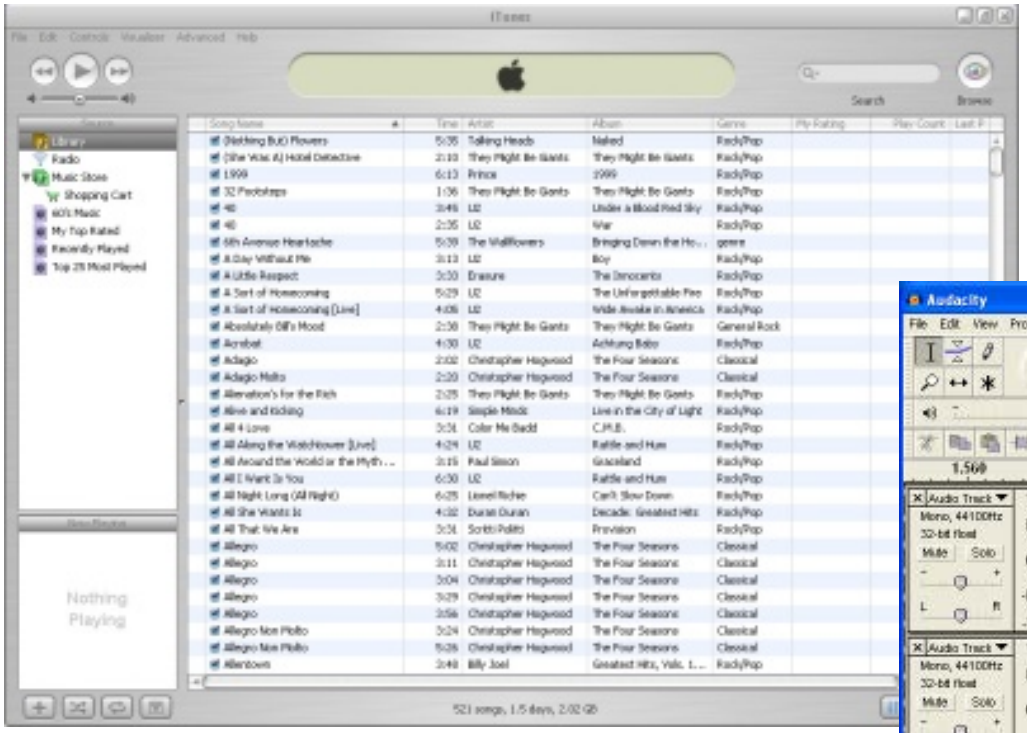
Graphics software

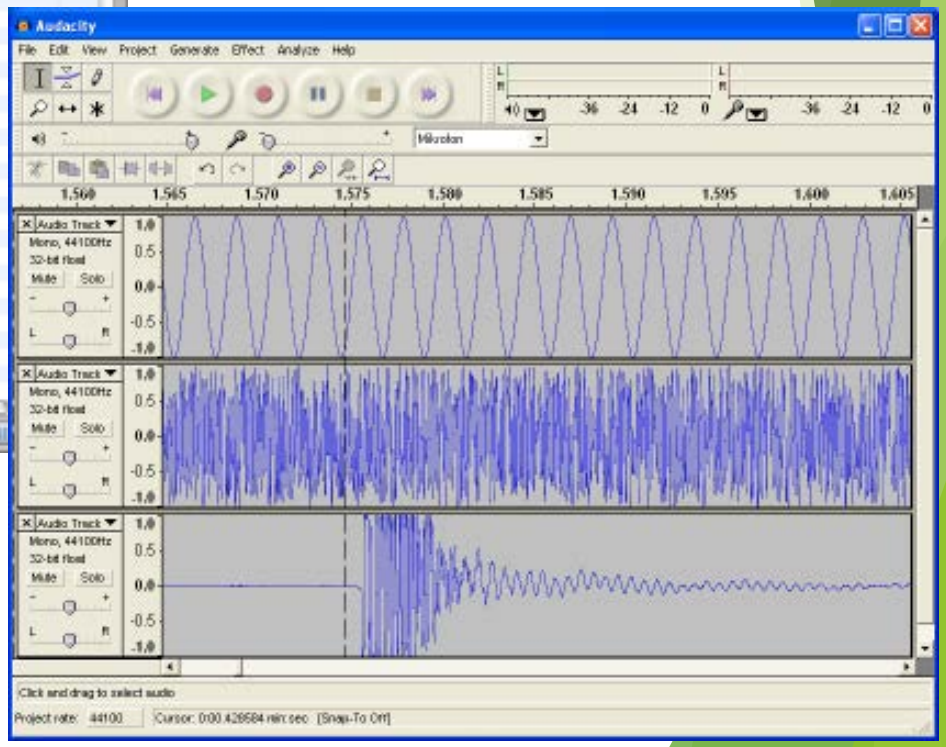




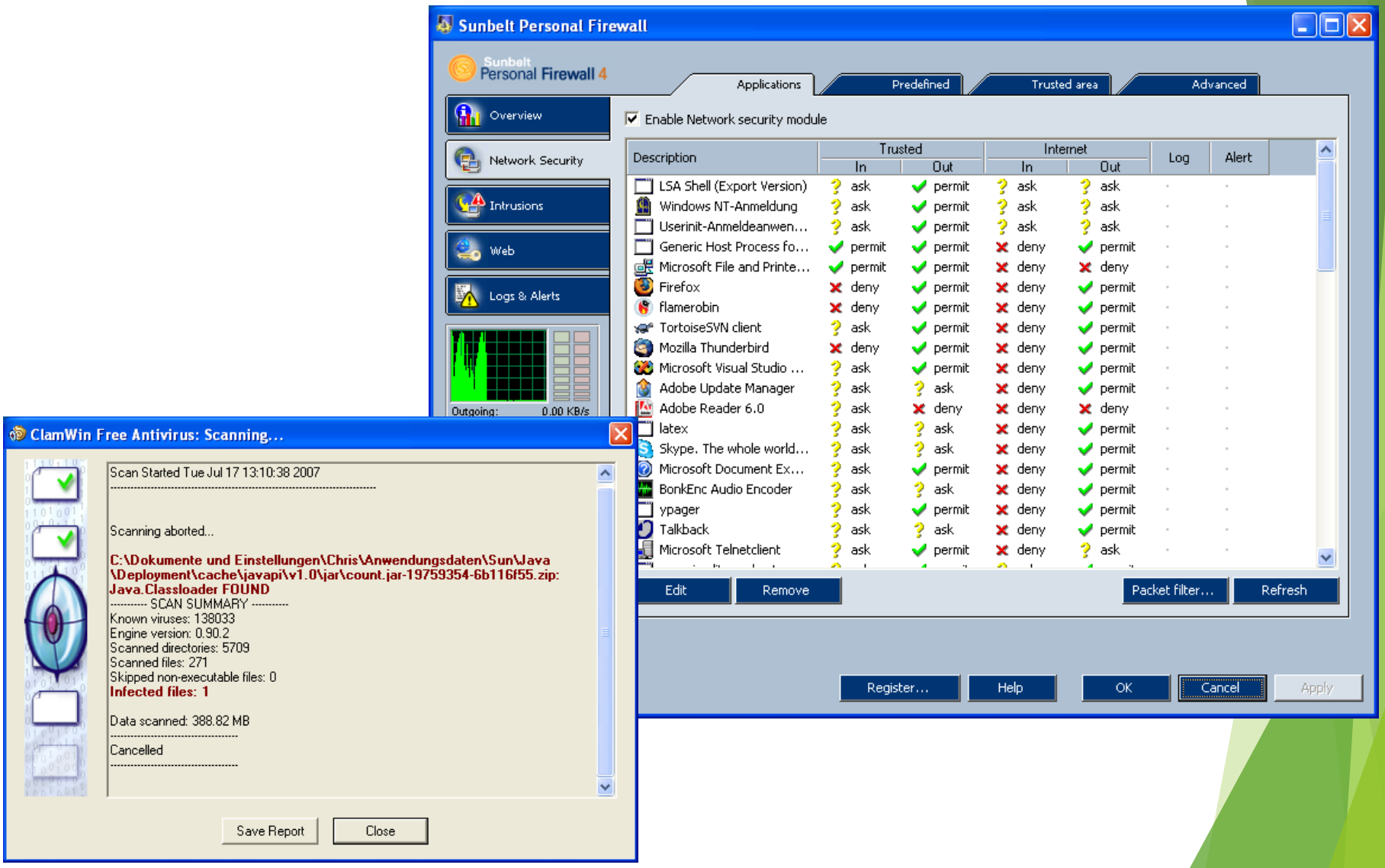


Music software

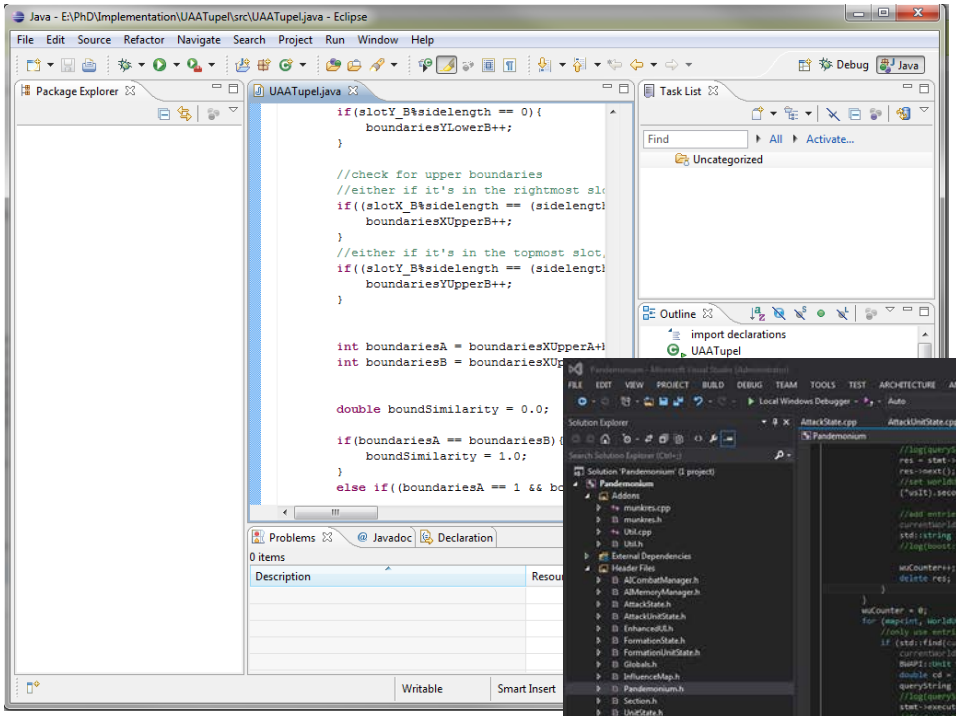




Security software

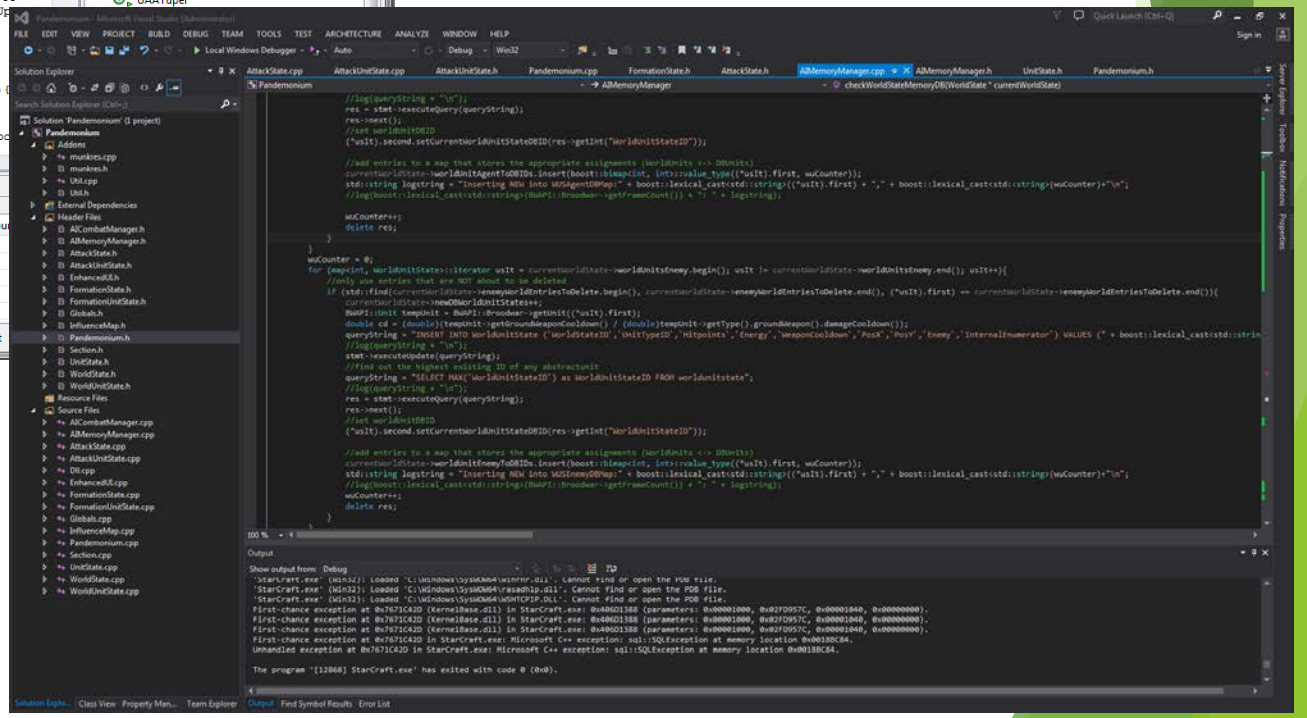


Software development



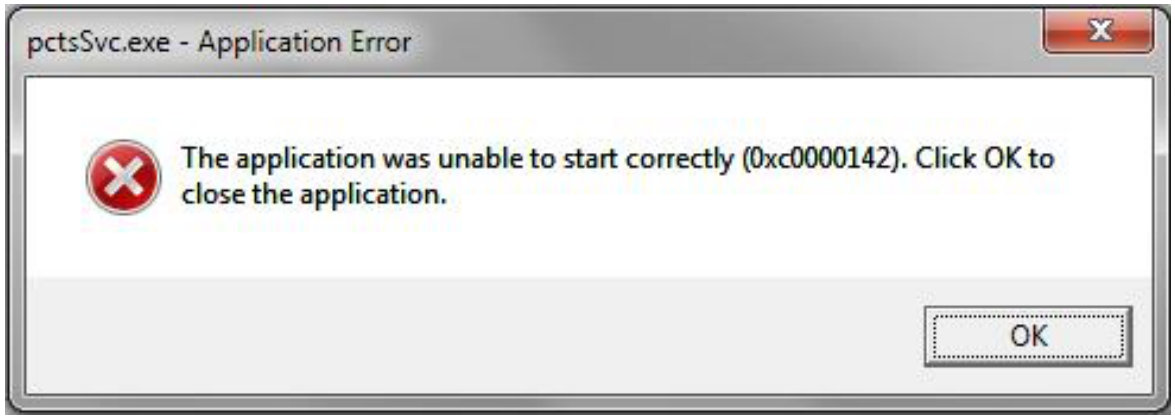
Eclipse

Visual Studio



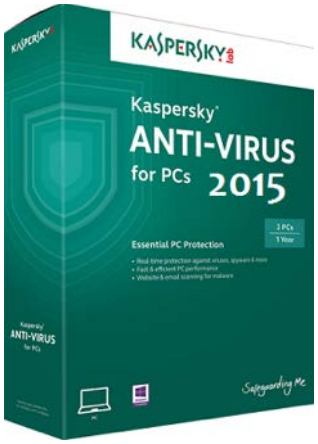
Software failure

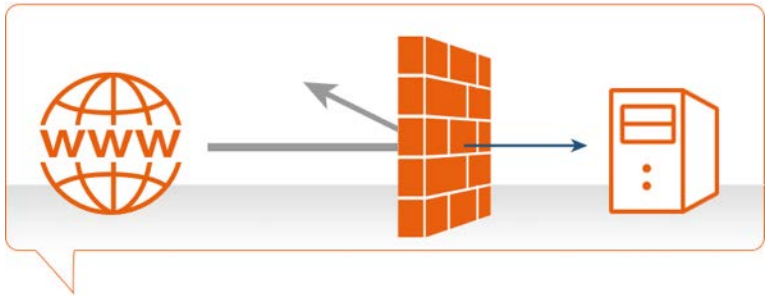
- Sometimes errors occur in software, they generally can't be fixed but you can:
  - Google your problem to see if there's a solution
  - Report the problem to the developer



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