

Software and Licences

Lecture 3 - COMPSCI111/111G SS 2018

© MARK ANDERSON

WWW.ANDERSTOONS.COM

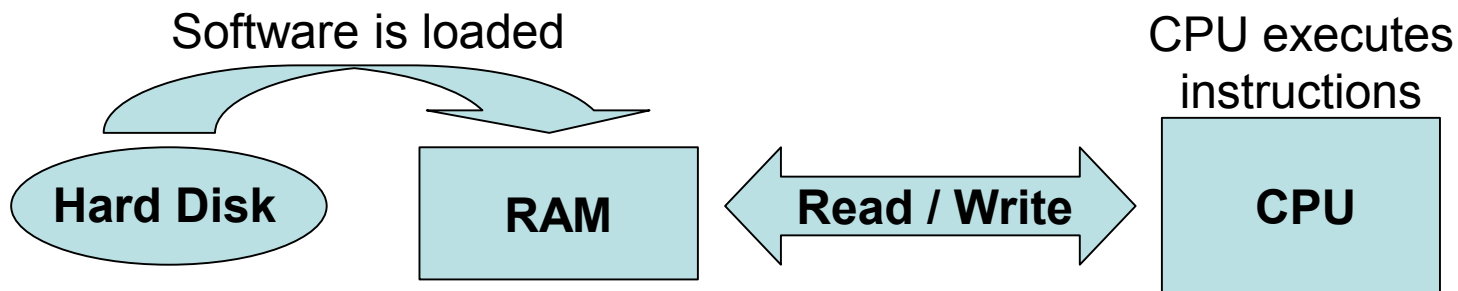


Today's lecture

- ▶ Describe what software is
- ▶ Understand the legal protections for software
- ▶ Learn about the 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, macOS)
 - ▶ 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

```
L1 exercises.pdf x
1 %PDF-1.5
2 %DÔÅØ
3 5 0 obj <<
4 /Length 972
5 /Filter /FlateDecode
6 >>
7 stream
8 xÚ-WKÛ6DLE%úW8VEM`*ES%ÚKnót f!M+SOzHsDLEli@DLEÉr,EMESCÿúSOUSÚøeG+QSOACKÿó
9 '3B7#š`{ÅèèÉ/óÉÖoÅDC1K^v+îi^U"... DLET8 óèùP\ÿöóÿiöíitE-NULà
10 [SUSçø^pE
   @DLE+nü>Û,USŠ ŠrãÄú,,ás^í'ÿ'è]fEXC•ää8G^EOT*�&US>2*Äu7EOTáæèqgC#NUL*µÀ~Mn'[]
   USbCANSOÄ (M5^—0CAN`œr!
   ðèF+††eò2,,äšSTX†#ÄpZâ5ESµ-]aD(<If^!0CùEOTnè*†CANÍ@6:NUL~žPi@QqÄ^7.†qDLEc
   DC1c@nSUB ;†xÄùCfù"ÛB1fDC2@Oé..
```

The beginning of a file using the PDF format

Standards

- ▶ File formats sometimes follow a standard; an agreed way of encoding data (eg. webpages use 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

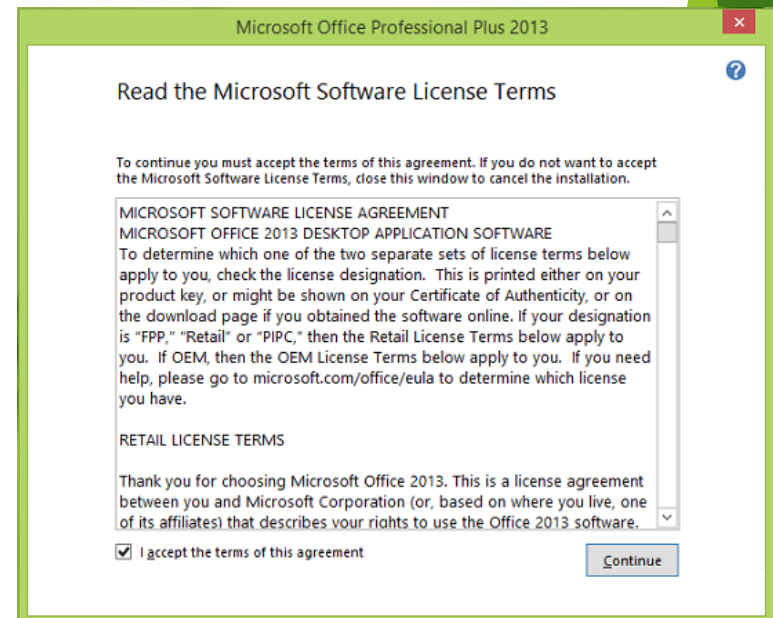
File extension

- ▶ 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

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

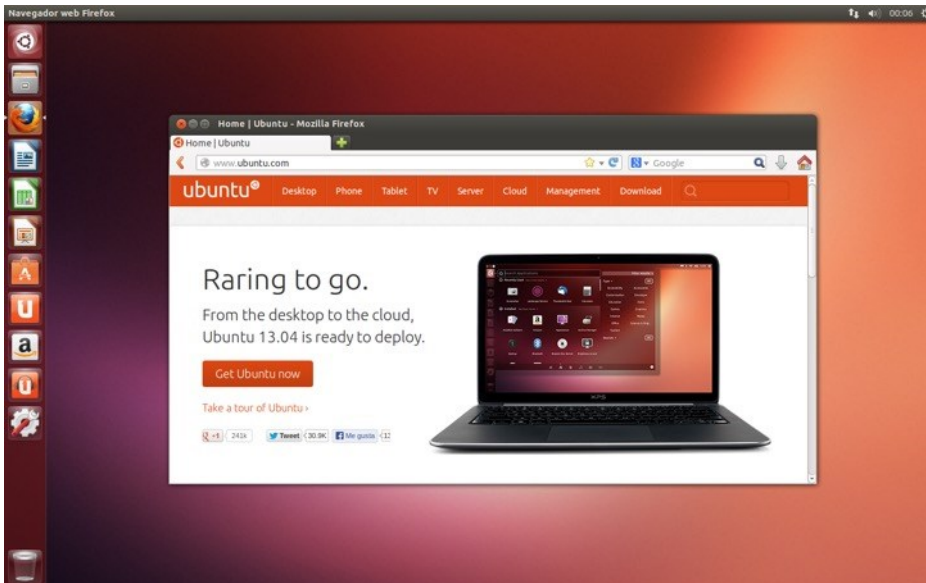
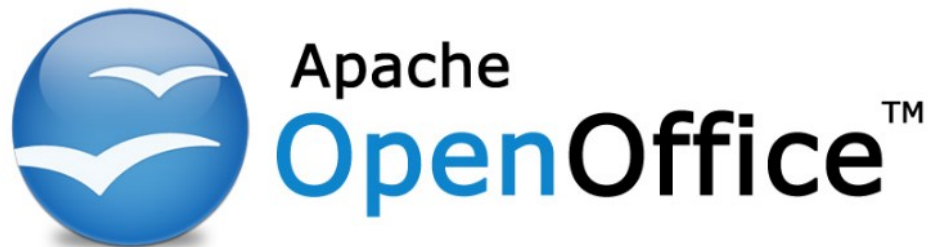


Open source software

- ▶ 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 outlined in 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

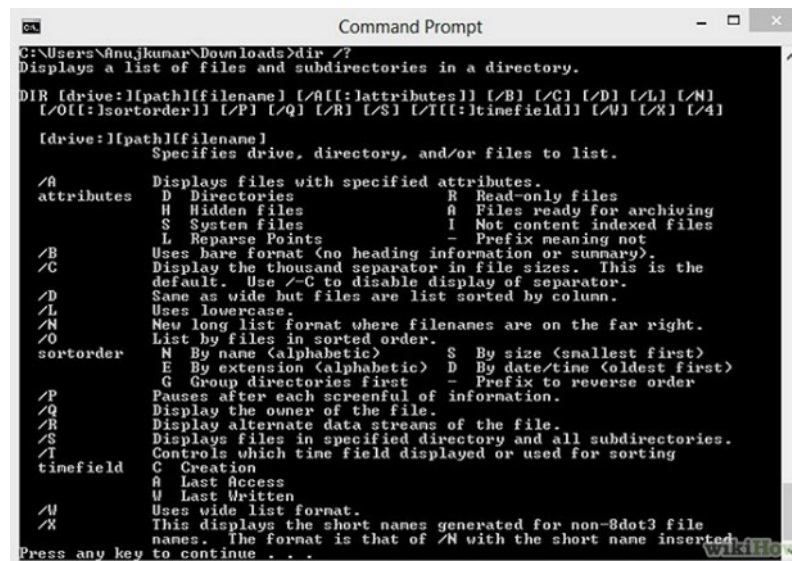


User interfaces

- ▶ 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



```
Command Prompt
C:\Users\Anujkumar\Downloads>dir /?
Displays a list of files and subdirectories in a directory.

DIR [drive:][path][filename] [/A[[:attributes]] [/B] [/C] [/D] [/L] [/N]
[/O[[:sortorder]]] [/P] [/Q] [/R] [/S] [/T[[:timefield]]] [/W] [/X] [/4]

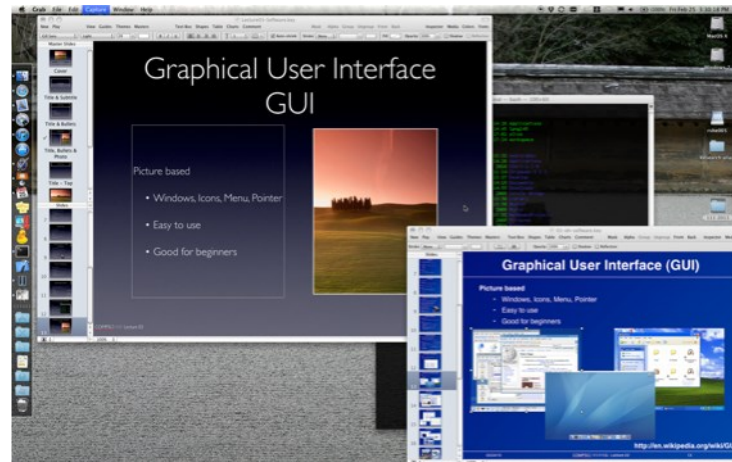
[drive:][path][filename]
    Specifies drive, directory, and/or files to list.

/A
attributes    Displays files with specified attributes.
              D Directories                R Read-only files
              H Hidden files              A Files ready for archiving
              S System files              I Not content indexed files
              L Reparse Points            - Prefix meaning not
/B
/C
              Uses bare format (no heading information or summary).
              Display the thousand separator in file sizes. This is the
              default. Use /C to disable display of separator.
/D
/L
/N
/O
              New long list format where filenames are on the far right.
              List by files in sorted order.
sortorder     N By name (alphabetic)                S By size (smallest first)
              E By extension (alphabetic)    D By date/time (oldest first)
              G Group directories first     - Prefix to reverse order
/P
/Q
/R
/S
/T
timefield    Controls which time field displayed or used for sorting
              C Creation
              A Last Access
              W Last Written
/W
/X
              Uses wide list format.
              This displays the short names generated for non-8dot3 file
              names. The format is that of /N with the short name inserted.

Press any key to continue . . .
```

Graphical user interface

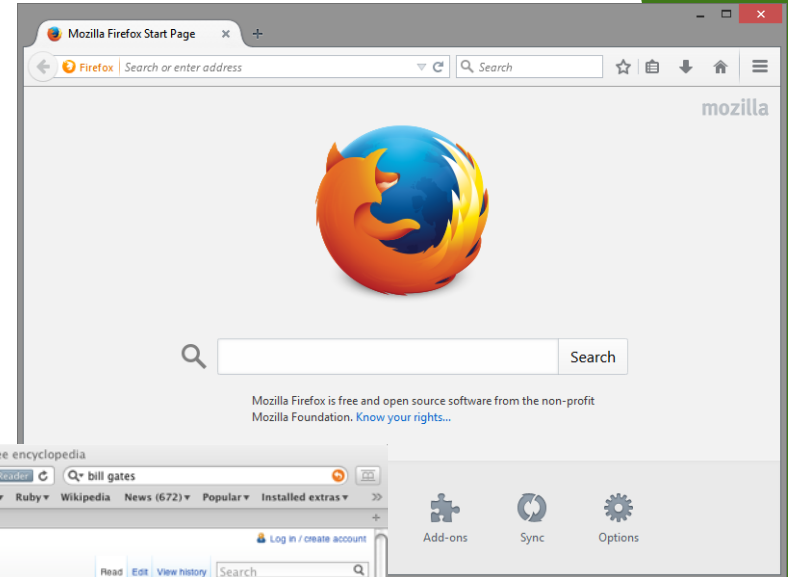
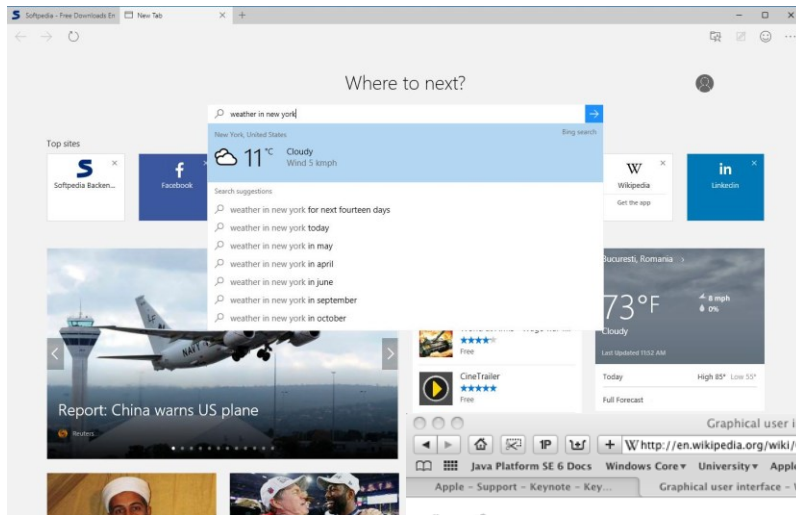
- ▶ User performs tasks using the software's graphical elements (eg. windows, pointers, icons, menus)
- ▶ Generally easy to use, especially for new users
- ▶ Can be inefficient for experienced users, but keyboard shortcuts help to make GUIs more efficient



Application software

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

Web browsers



Email clients

Microsoft Outlook Preview
Inbox - SaraD@contoso.com

MAILBOXES: Inboxes, Sent, Trash, Junk, Reminders, Notes, To Do, On My Mac, Work

SEARCH: Search Current Mailbox (Ctrl-E)

EMAIL LIST:

- Project Eagle** (6/8/2012)
The team mailbox named "Project Eagle" has ...
The "Project Eagle" team mailbox has been ...
- Bonnie Kearney** (TWO WEEKS AGO)
Review Proposal for Tallspin Toys
- Bonnie Kearney; Aziz Hassouneh** (THREE WEEKS AGO)
RE: Review Proposal for Tallspin Toys
- Katie Jordan**
It looks pretty good; I added a few more things
- Katie Jordan; Sunil Uppal**
Thanks
- Luka Abrus**
I've seen this and am going to hold back on
- Sunil Uppal**
Yes, all, please note that a partnership with
- Reina Cabatana; Janet Galore; Mol...** (5/31/2012)
Company Soccer Team
It looks like we've decided on a date/time.
- Molly Dempsey** (5/31/2012)
Lunch?
When: Occurs every Friday from 12:00 PM to
- Aziz Hassouneh; Bonnie Kearney** (5/31/2012)
Come One, Come All
Could you all please remember not to reply all
- Reina Cabatana** (6/1/2012)
Updated Budget for Tallspin Toys...

CALENDAR: June 2012
SU MO TU WE TH FR SA
27 28 29 30 31 1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
1 2 3 4 5 6 7

1:00 PM Sara/Garth 1:1
Sara's Office

4:00 PM Friday Unwinder
Cafeteria

MAIL CALNDAR PEOPLE TASKS

ITEMS: 65 UNREAD: 1

ALL FOLDERS ARE UP TO DATE. CONNECTED TO MICROSOFT EXCHANGE 100%

Apple Mail
Inbox (8 messages)

MAILBOXES: Inboxes, Sent, Trash, Junk, Reminders, Notes, To Do, On My Mac, Work

SEARCH: Search

EMAIL LIST:

- Jane Adams** (Today)
TEU-academic Fantastic turnout at union meeting 9:37 PM
- Clare Terwiel & Warren Pearson** (22 February 2011)
re how are you 9:34 PM
- Robert Shoehan** (17 February 2011)
Te do list - work 11:40 AM
- Anna Jared** (15 February 2011)
RE: Callee Family Group in 2011 9:29 PM
- Gill Dobbie** (9 February 2011)
FW: Teachers Professional Development ... 8:50 AM
- Robert Shoehan** (1 February 2011)
contact John and rosalee about dad 8:02 PM
- Robert Shoehan** (31 December 2010)
Possible Part IV project 11:50 AM
- Robert Shoehan** (18 July 2010)
Mum community services card client number 31... 5:53 PM

EMAIL CONTENT:

From: Jane Adams <jane.adams@teu.ac.nz>
Subject: TEU-academic! Fantastic turnout at union meeting
Date: 25 February 2011 9:36:42 PM NZDT
To: teu-academic@list.auckland.ac.nz
2 Attachments, 105 KB [Save] Quick Look

A strong turnout today of TEU academic members, from all campuses, demonstrated their solidarity and determination to protect important terms and conditions of employment.

An industrial action ballot was held. If you have not yet voted, you can complete and return via email the ballot form you have been sent or use the one attached. Additionally, ballot stations will be set up on each campus for the next week, closing Friday. At the City campus a ballot station will be outside the library from 12-1pm each day. Tamaki, Epsom and Grafton members will be notified about their ballot stations shortly.

In solidarity,
Jane Adams
On behalf of TEU negotiation team
Organiser
Tertiary Education Union

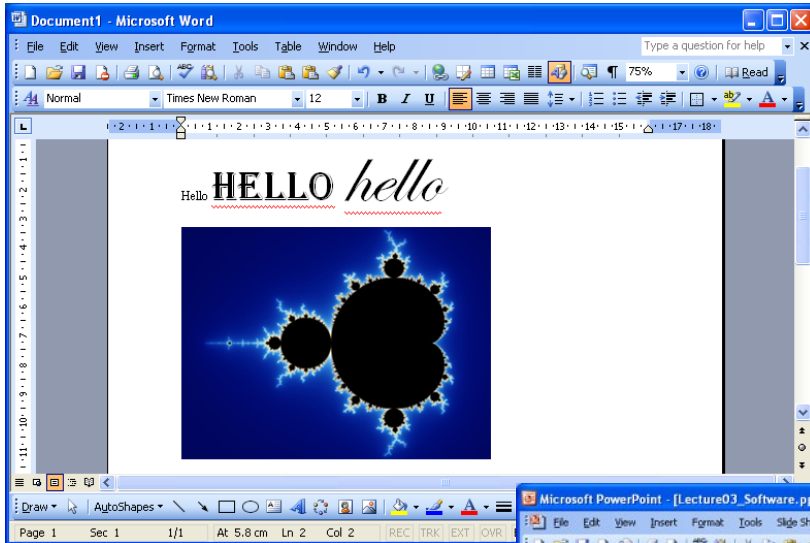
C/- Fisher Bldg
18 Waterloo Quadrant
Level 4, Rm 417

Mob: 0274 387 254
Phone: +64 9 373-7599 x 85169
Email: jane.adams@teu.ac.nz
www.teu.ac.nz
Join TEU - because we are stronger together <http://teu.ac.nz/join/whv-join/teu/>

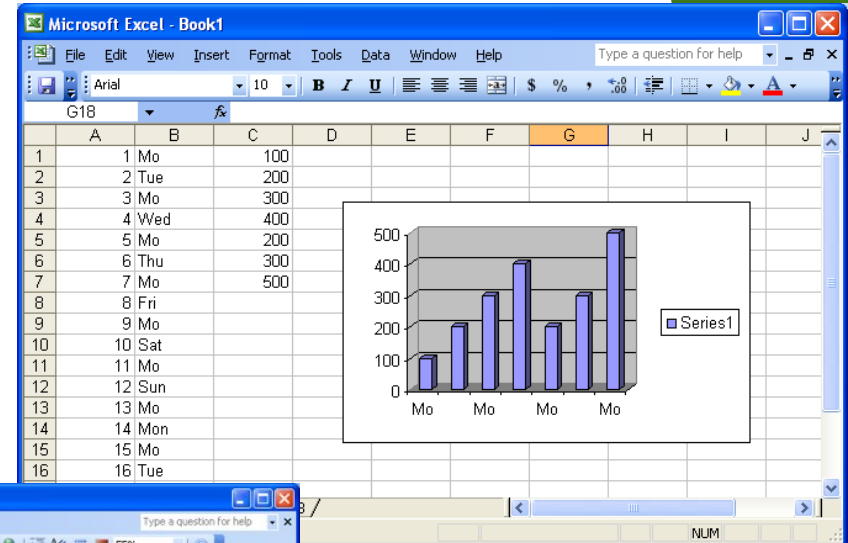
TERTIARY EDUCATION UNION
Te Hautū Kahurangi o Aotearoa

Industrial.ac.nz (62.9 KB)
Teu-academic mailing list
teu-academic@list.auckland.ac.nz
<https://list.auckland.ac.nz/mailman/listinfo/teu-academic>

Office software



Word

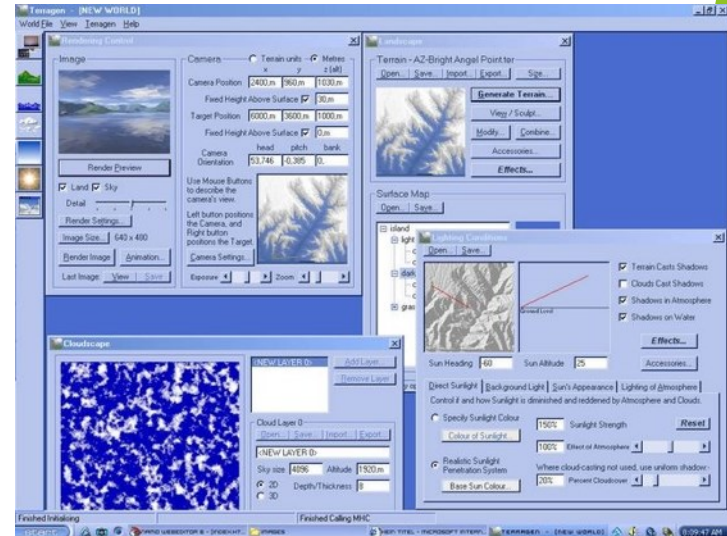
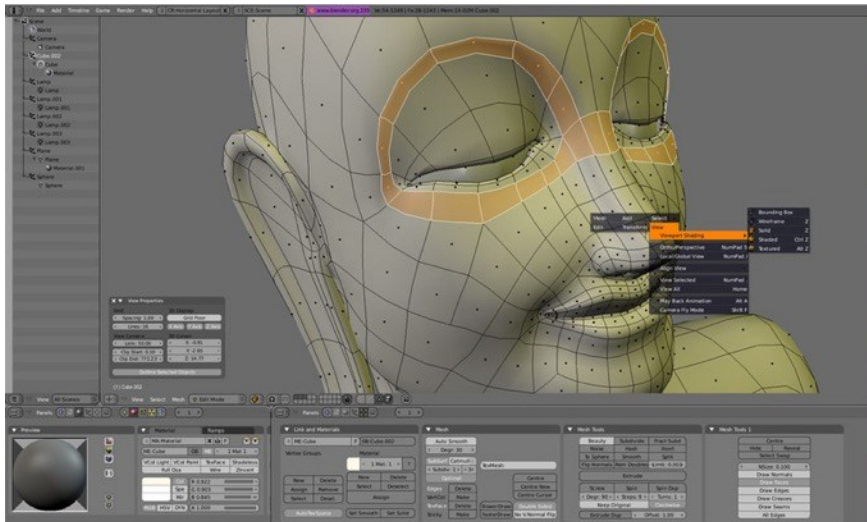
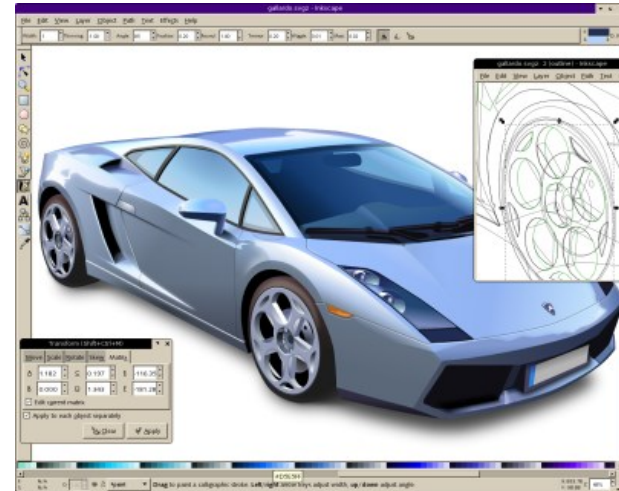
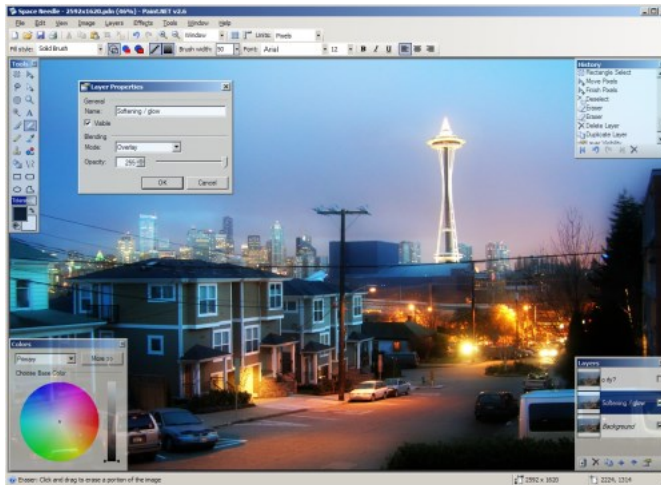


Excel



PowerPoint

Graphics software



Music software

The screenshot shows the iTunes application window. The top menu bar includes File, Edit, View, Controls, Account, and Help. The main interface is divided into a left sidebar with 'Library' and 'Playlists' sections, and a main content area. The 'Recently Played' playlist is selected, showing a list of 19 songs. The playlist summary indicates 61 songs, 3 hours, 25 minutes, and 446.4 MB of content.

✓	Name	Time	Artist	Album	Genre	Rating
1	✓ Sour Soul	2:46	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
2	✓ Stark's Reality	2:13	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
3	✓ Tone's Rap	2:59	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
4	✓ Mind Playing Tricks	2:38	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
5	✓ Nuggets of Wisdom	2:11	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
6	✓ Food	3:24	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
7	✓ Experience	2:37	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
8	✓ Six Degrees	3:41	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
9	✓ Ray Gun	3:07	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
10	✓ Gunshowers	3:03	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
11	✓ Street Knowledge	3:25	BADBADNOTGOO...	Sour Soul	Rap & Hip...	
12	✓ 01 Philorene - Bola	3:18	Coldcut	Journeys by DJ	Other	
13	✓ 02 The Truper - Street Beats	3:01	Coldcut	Journeys by DJ	Other	
14	✓ 03 Junior Reid - One Blood	2:24	Coldcut	Journeys by DJ	Other	
15	✓ 04 Newcleus - Jam On Revenge	1:12	Coldcut	Journeys by DJ	Other	
16	✓ 05 2 Player - Extreme Possibilities	1:09	Coldcut	Journeys by DJ	Other	
17	✓ 06 Funki Porcini - King Ashabana...	1:35	Coldcut	Journeys by DJ	Other	
18	✓ 07 Jedi Knights - Nobody Holder	2:53	Coldcut	Journeys by DJ	Other	
19	✓ 08 Plastikman - Fuk	1:09	Coldcut	Journeys by DJ	Other	

The screenshot shows the Audacity audio editing software interface. The top menu bar includes File, Edit, View, Project, Generate, Effect, Analyze, and Help. The main interface features a central waveform display area with three tracks. The top track is labeled 'Audio Track' and shows a waveform with a peak of 1.0. The middle track is also labeled 'Audio Track' and shows a waveform with a peak of 1.0. The bottom track is labeled 'Audio Track' and shows a waveform with a peak of 1.0. The interface includes a transport control bar at the top with play, stop, and record buttons, and a project rate of 44100 Hz. The cursor is positioned at 0:00.426584 min:sec.

Security software

Norton 360 (BETA)

Tasks Settings Performance Feedback Account Support

Security Identity Backup Tuneup

Protected Protected Protected Protected

Manage Mobile Online Family Safe Web

Subscription Status: 14 Days Remaining

Sunbelt Personal Firewall 4

Applications Predefined Trusted area Advanced

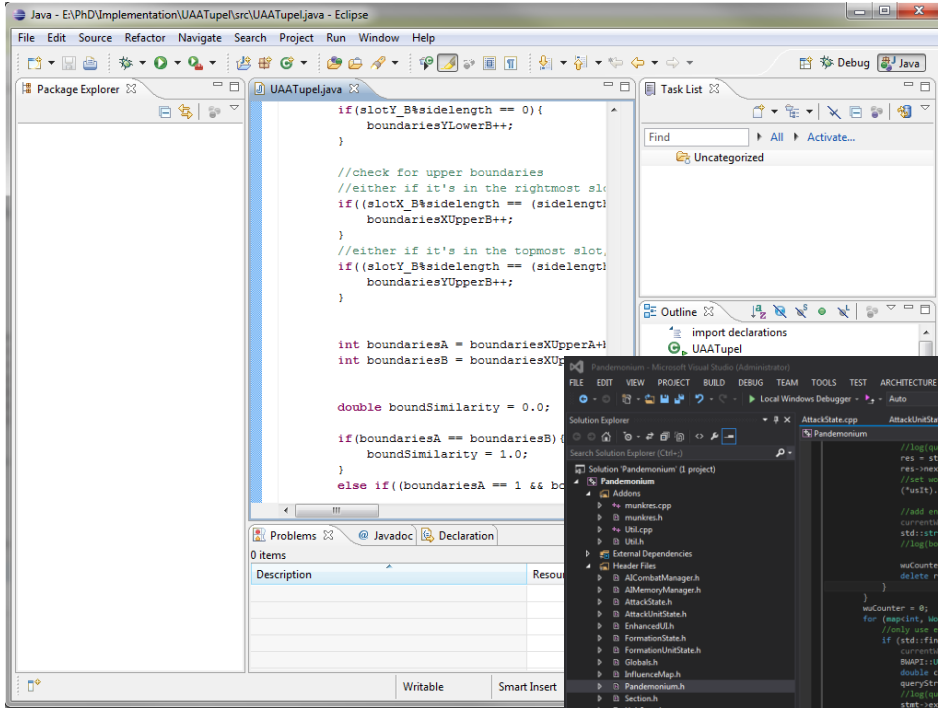
Enable Network security module

Description	Trusted		Internet		Log	Alert
	In	Out	In	Out		
LSA Shell (Export Version)	ask	permit	ask	ask		
Windows NT-Anmeldung	ask	permit	ask	ask		
Userinit-Anmeldeanwen...	ask	permit	ask	ask		
Generic Host Process fo...	permit	permit	deny	permit		
Microsoft File and Printe...	permit	permit	deny	deny		
Firefox	deny	permit	deny	permit		
flamerobin	deny	permit	deny	permit		
TortoiseSVN client	ask	permit	deny	permit		
Mozilla Thunderbird	deny	permit	deny	permit		
Studio ...	ask	permit	deny	permit		
anager	ask	ask	deny	permit		
0	ask	deny	deny	deny		
e world...	ask	ask	deny	permit		
ent Ex...	ask	permit	deny	permit		
ncoder	ask	ask	deny	permit		
	ask	permit	deny	permit		
lient	ask	ask	deny	permit		
	ask	permit	deny	ask		

Remove Packet Filter... Refresh

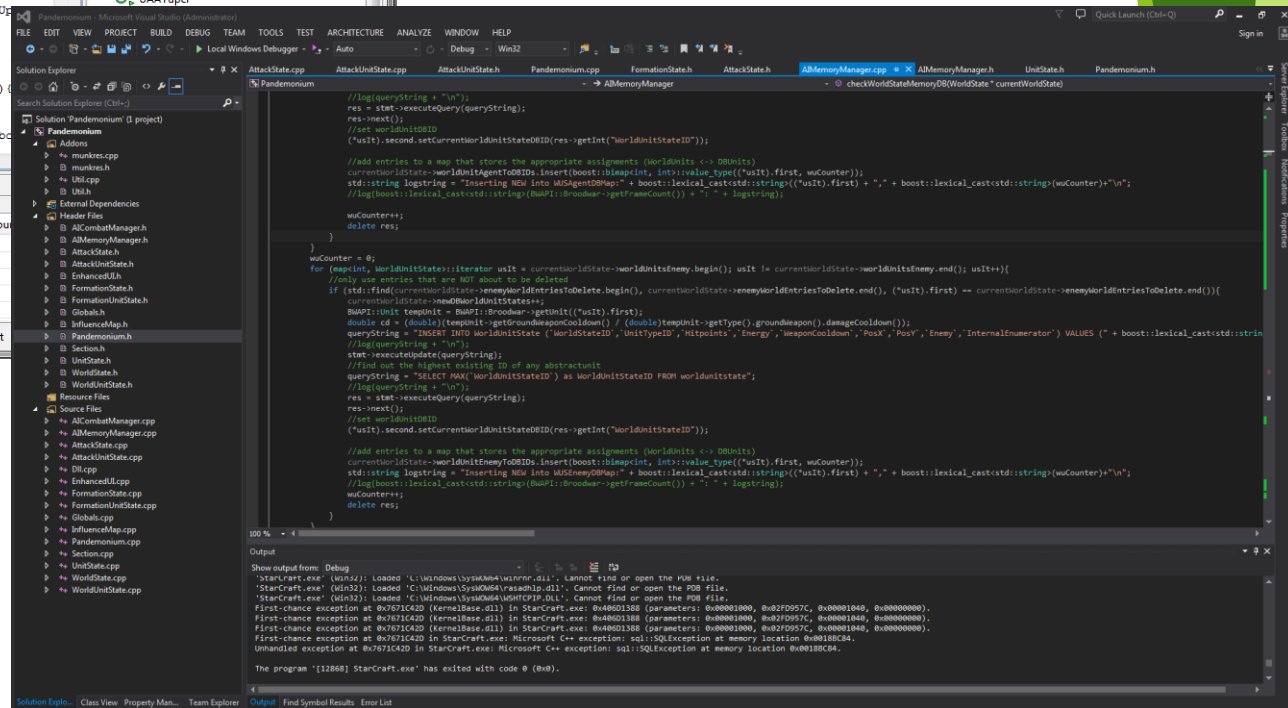
Register... Help OK Cancel Apply

Software development tools



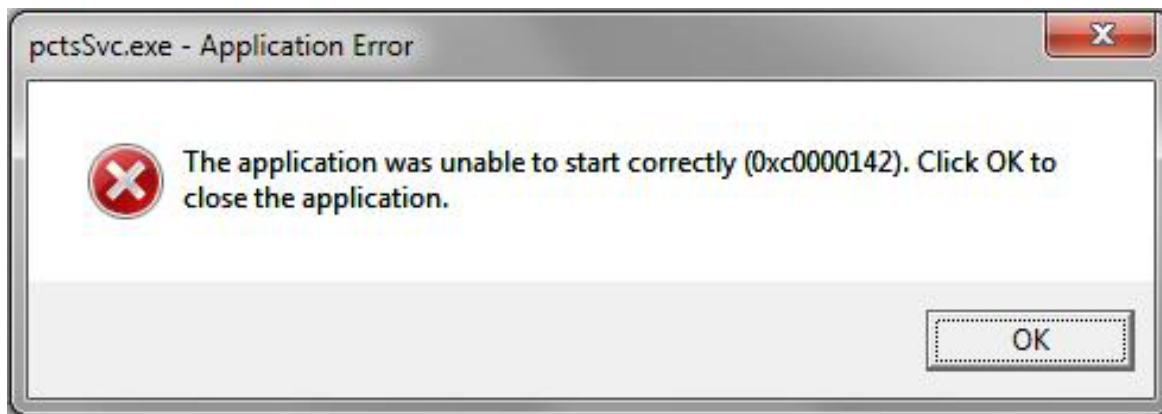
Eclipse

Visual Studio



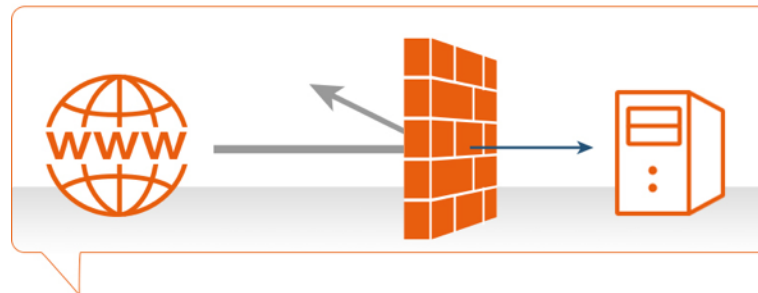
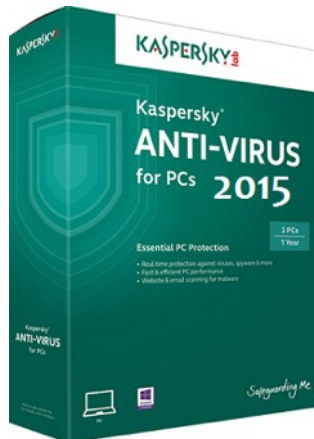
Software failure

- ▶ Sometimes errors occur in software, which lead to crashes or error messages
- ▶ Generally can't be fixed by the user but you can:
 - ▶ Google your problem to see if there's a solution
 - ▶ Report the problem to the developer
 - ▶ Check for program updates since developers include bug fixes in these updates



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



Answers

- ▶ What kind of licence is best for software you want to give away for free?
- ▶ What is one advantage of the CLI and one disadvantage of the GUI?

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