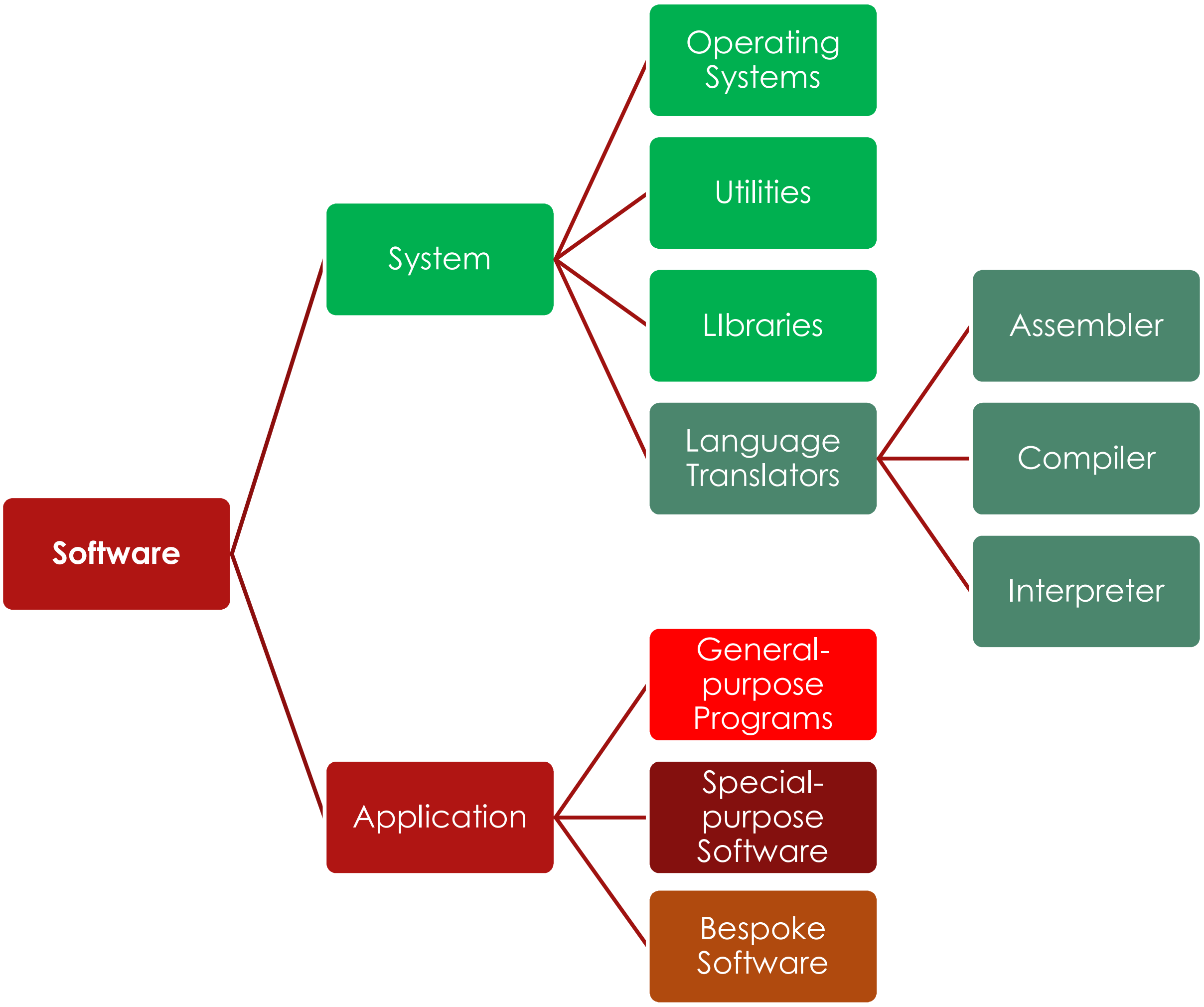
Software

1 Classification of Software[1]

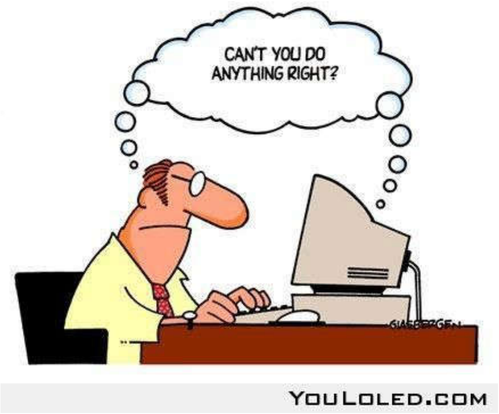
The following diagram shows the way we classify software:



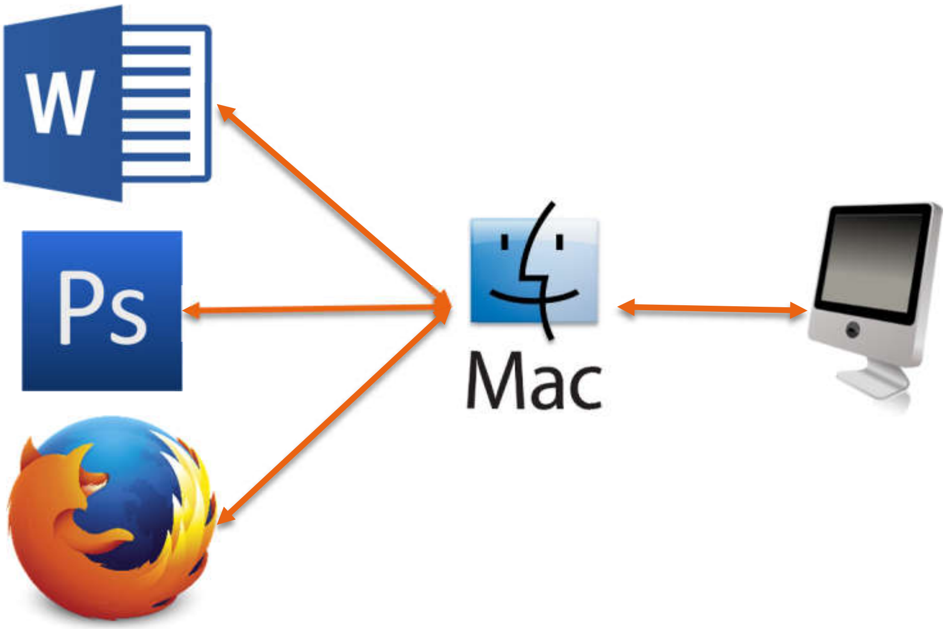
System software - software designed to operate the computer hardware and to provide a platform for running application software.

[1] http://www.multiwingspan.co.uk/as2.php?page=soft

1.1 Operating Systems



- a collection of programs that *make the computer hardware conveniently available to the user* and also *hide the complexities of the computer's operation.*
- The Operating System is also *an interface between the application software and computer*. Without the operating system, the application programs would be unable to communicate with the computer. The Operating System (such as Windows 8 or various distributions of Linux) interprets commands issued by application software (e.g. word processor and spreadsheets).



1.2 Utility programs

- are small, powerful programs with a limited capability; they are usually operated by the user to maintain a smooth running of the computer system. Various examples include
  - file management,

    - diagnosing and fixing problems,
    - finding out information about the computer, etc.
- Notable examples of utility programs include copy, paste, delete, file searching, disk defragmenter, disk cleanup. However, there are also other types that can be separately installable from the Operating System.

1.3 Library programs

- Library programs are compiled libraries of commonly-used routines. On a Windows system they usually carry the file extension **dll** and are often referred to as **run-time libraries**. The libraries are run-time because they are called upon by running programs when they are needed. When you program using a run-time library, you typically add a reference to it either in your code or through the IDE in which you are programming.
- Using library programs saves time when programming. It also allows the programmer to interact with proprietary software without having access to its source code.

1.4 Language Translators

Whatever language or type of language we use to write our programs, they need to be in machine code in order to be executed by the computer. There are 3 main categories of translator used,

1.4.1 Assembler

An assembler is a program that translates the mnemonic codes used in assembly language into the bit patterns that represent machine operations. Assembly language has a one-to-one equivalence with machine code, each assembly statement can be converted into a single machine operation.

1.4.2 Compiler

A compiler turns the source code that you write in a high-level language into object code (machine code) that can be executed by the computer.

The compiler is a more complex beast than the assembler. It may require several machine operations to represent a single high-level language statement. As a result, compiling may well be a lengthy process with very large programs.

1.4.3 Interpreter

Interpreters translate the source code at run-time. The interpreter translates statements one-at-a-time as the program is executed.

Interpreters are often used to execute high-level language programs whilst they are being developed since this can be quicker than compiling the entire program. The program would be compiled when it is complete and ready to be released.

Interpreters are also used with high-level scripting languages like *PHP, Javascript* and many more. These instructions are not compiled and have to be interpreted either by the browser (in the case of Javascript) or by interpreters on the server (in the case of PHP).

Some programming languages make use of both compilers and interpreters. If you were to write a *Java* program in a text editor, when you came to compile it with the Java compiler, you would actually be creating something called **bytecode**. Bytecode can be thought of as an intermediate stage between source code and object code. When a computer executes a Java program, library programs on that machine interpret the bytecode. This allows Java to be platform-independent - a user needs the correct run-time libraries for Java on their machine in order to execute the programs.

1.5 Application Software

Application software tends be used for the tasks that have some relationship to the world outside of the computer. For example, you might use a word processor to write a letter or an essay. Although you use the computer to perform the task, the task itself might reasonably be considered to be a non-computer task.

1.5.1 General-Purpose Software

Software is general-purpose if it can be used for lots of different tasks. You can use a word processor to write letters, memos, essays, instructions, notes, faxes, invoices and lots more.

These days we tend to use integrate suites of office software where a range of general-purpose software is provided, usually with the facility to combine elements from each application in a single file.

1.5.2 Special-Purpose Software

This software performs a single specific task. This task might be complex like payroll calculation, stock control etc. but will be based on a single task.

As with many abstract concepts, you can stretch these definitions until they blur a little. These days, web browsers can contain a lot of features. They are still primarily focused on a single task, rendering web pages and so the web browser is special-purpose. Being able to access an application using a browser does not change the main purpose of the browser software itself.

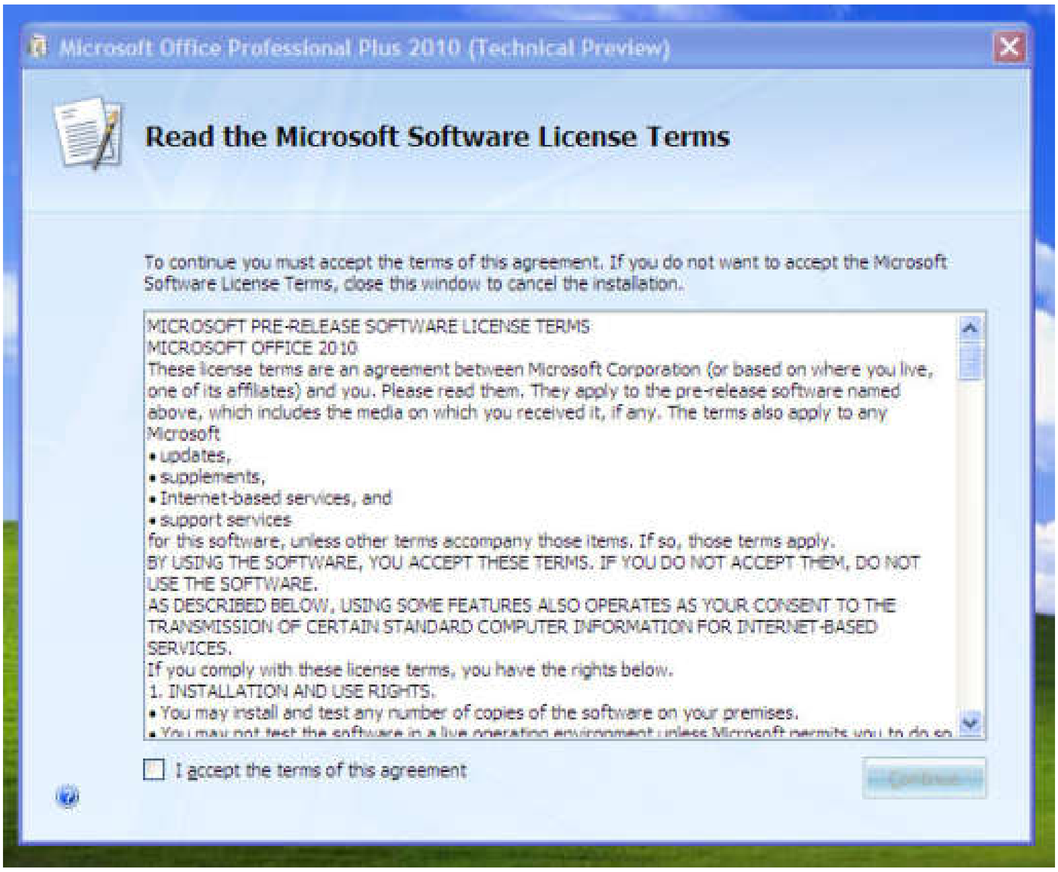
1.5.3 Bespoke Software

Bespoke software is written for a single client. Large organisations have a need for well-developed applications suited to their specific needs. Such software is often expensive to develop since the development costs are not shared among a large number of people purchasing the software.

Examples: Air Traffic Management software, ATM software, logistics software for shipment companies like UPS or DHL, etc.

2 Software Licences

- A ***software license*** is usually an agreement that grants a right to **use *software*** to someone else.
- The rights to use the code are defined by the terms of the license – for individual users typically **EULA – End User License Agreement**.
- Nearly all applications are licensed rather than sold. There are a variety of different types of software licenses. Some are based on the number machines on which the licensed program can run whereas others are based on the number of users that can use the program.
- Most personal computer software licenses allow you to run the program on only one machine and to make copies of the software only for backup purposes. Some licenses also allow you to run the program on different computers as long as you don't use the copies simultaneously.
- Conditions defined by licenses
  - *the cost of the rights to use the software,*
  - *how long the software may be used,*
  - *support for the software (updates, upgrades, or technical assistance),*
  - *the warranty terms, if any,*
  - *the liability of each party for damages that result from the licensee's use of the software (typically, there is no warranty or liability).*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AS DESCRIBED BELOW, USING SOME FEATURES ALSO OPERATES AS YOUR CONSENT TO THE TRANSMISSION OF CERTAIN STANDARD COMPUTER INFORMATION FOR INTERNET-BASED SERVICES.
If you comply with these license terms, you have the rights below.
1. INSTALLATION AND USE RIGHTS.
- You may install and test any number of copies of the software on your premises.
- You may not test the software in a live operating environment unless Microsoft permits you to do so

2.1 License Types

1) **Trialware or demoware:** A trialware is software which is provided to a user for trial purposes. A trial version has different sets of restrictions. Some of them are for trying the product for a certain number of a particular duration. When the time has elapsed, the trialware stops working and then the user have to buy the full version. Others restrictions also include less functionalities in the trialware.
2) **Shareware:** A shareware is software which can be distributed. The software works like the full version of the product with some functionalities deliberately turned off. A user after certain time (as set up in the software – typically 1 month/3 days etc.) gets a pop up dialog box which asks him to buy the full version for unlimited functionalities or usage. Many companies also put a time restriction after which the software may stop functioning fully. Then the user has to buy the product to use it.

3) **Freeware** - Copyrighted software given away for free by the author. Although it is available for free, the author retains the copyright, which means that you cannot do anything with it that is not expressly allowed by the author. Usually, the author allows people to use the software, but not sell it.

4) **Freemium = free + premium** – software/apps, which are offered to users free of charge, but typically with limited functionality, advertiser support or additional features that are only available for a premium charge – power-ups, virtual money, special characters, secret levels etc. Extremely popular in apps from Apple App Store or Google Play.

5) **Open source software:** For open source software the code of the software is open to the public. People can edit and distribute the software as per their own requirements. They can also sell new software by creating its new versions from the open source provided the company who originally created the product allows them to. Many open source licenses are such that users can edit software and create new versions, and even distribute provided the new software is free.
Examples: GNU GPL license, BSD license, Apache License
Software examples: Linux, Firefox, Audacity, LibreOffice, OpenOffice, GIMP ...

6) **Public domain software:** Public domain software is the one for which is not copyright to any individual or organization. Public domain software is not related to freeware in any ways. For this software, there's just no copyright involved.

7) **Proprietary software:** proprietary software is the one which cannot be modified, shared or redistributed by the user. The company which is providing the proprietary software has the legal copyright for that particular software. Examples: Windows, MS Office, Adobe Photoshop, Sony Vegas, Eset Smart Security

2.2 Licenses in More Details

2.2.1 Individual licenses

- ***Individual (Single-user)****:* This license type allows the program to be installed and used on one CPU which is not accessed by other users over a network. The software will only be used on a single computer, and other users will not be able to access or run the software while connected to your computer. Types of individual licenses are:

    1. **Perpetual license:** allows the customer to install and use the software indefinitely.
    2. **Subscription license:** Allows the user to use the software for a specified time period. At the end of the term the user has several options:
        - renew the subscription;
        - purchase a perpetual license at a discounted cost;
        - remove the software from the computer.
    3. **Freeware license:** This license type is offered as freeware by the author and does not require paying any fee for use.
    4. **Shareware license:** This is a license to use software for a trial period and then, if you continue to use the software, you must pay a shareware fee or cease using the software.

- ***Special Channel Licenses***

    1. **OEM (original equipment manufacturer):** These licenses cover software for stand-alone PC's and notebooks and MUST stay bundled with the computer system and NOT distributed as a separate (or stand-alone) product. This software is identified or labeled "For Distribution Only With New Computer Hardware." (long story short – the computer dies the license dies).
    2. **Educational or Academic Software:** Software marked for distribution to educational institutions and students at reduced prices. This software is usually labeled that it is an academic product and for use only by academic or educational institutions.
    3. **Not for Resale (NFR) Software License:** Specific and restricted licenses that are made available by software vendors directly to the distribution channel and are typically marked NFR with explicit conditions that it is NOT

FOR RESALE. The NFR software is not licensed for normal commercial distribution.

- *Concurrent Use:* This license type requires that you purchase licenses for the maximum number of people who will be running the software simultaneously. However, you can usually install the software on more computers than

2.2.2 Individual/Multi-user licensing

- **Volume licenses:** allows the Licensee to install the software on a certain number of computers. The Licensee usually has to satisfy a minimum purchase requirement and obtains reduced prices in exchange. When purchasing the licenses, the licensee usually receives one copy of the media and documentation with the option of purchasing more.
- **Site/Enterprise:** This license provides access to software at a single location. Typically, these licenses are individually negotiated with the publisher and vary widely in their provisions.
- **Unlimited:** See Site/Enterprise license above.

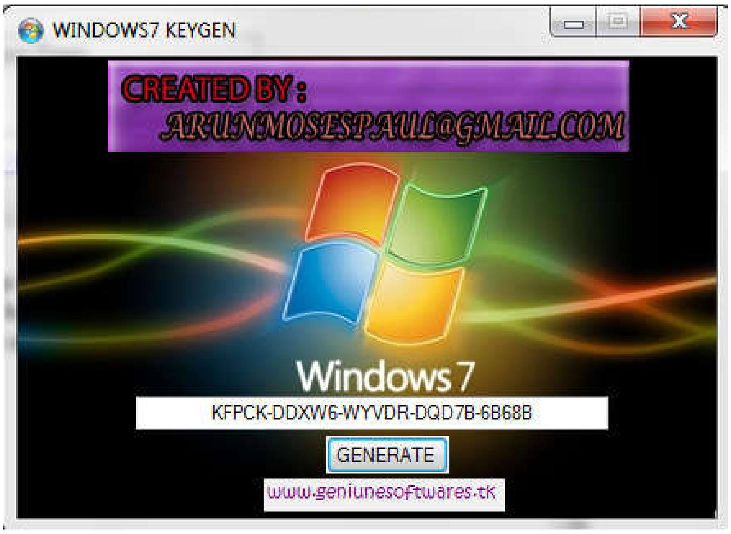
2.2.3 Add-on's to existing or new licenses

- **Upgrade:** This license is acquired when a user has a previously acquired software license and would like to move up to a newer version. This is not the same as a maintenance or subscription agreement. The previous version becomes void and you cannot transfer the previous version to another user.
- **Student use:** This allows students to use the software as long as they are students of the institutions. Students are required to uninstall software upon leaving the University.
- **Subscription/Maintenance:** This is an agreement between the license holder and the software developer that allows the user to obtain all updates or upgrades for software during the term of a contract. This is usually purchased in addition to a license and at the same time as the license. Subscription/Maintenance is usually renewable at the conclusion of the term of the contract. Subscription/Maintenance added to an existing license may change the original license (e.g. Microsoft select software assurance added to an OEM license changes the OEM license to a Microsoft select license; with all benefits)

2.3 Software Piracy

ARRRR!, I'll take 500 copies of Photoshop and 300 Microsoft Words
WHAT PIRATE SOFTWARE WEEKLY
CDs AHOY!

- Software piracy is the mislicensing, unauthorized reproduction and illegal distribution of software, whether for business or personal use[2].
- What piracy may cause[3]
  - Increase the chances that the software will not function correctly or will fail completely;
  - Forfeit access to customer support, upgrades, technical documentation, training, and bug fixes;
  - Have no warranty to protect themselves;
  - Increase their risk of exposure to a debilitating virus that can destroy valuable data;
  - May find that the software is actually an outdated version, a beta (test) version, or a nonfunctioning copy;
  - Are subject to significant fines for copyright infringement; and
  - Risk potential negative publicity and public and private embarrassment.



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[2] http://www.microsoft.com/en-us/piracy/default.aspx

[3] http://www.siia.net/index.php?option=com_content&view=article&id=345:consequences-of-software-piracy&catid=162:anti-piracy-articles&Itemid=373