

- **Course work** (*changes*)
- **Computer science is important**
  - **IT professions** (*you can't choose without CS*)

Term 1	Term 2	Term 3	Term 4
<b>11.1A Computer systems</b> <ul style="list-style-type: none"> <li>• Software categories</li> <li>• Operational systems</li> <li>• Von Neumann architecture</li> <li>• Memory types</li> <li>• Boolean logic</li> </ul>	<b>11.2A Information systems</b> <ul style="list-style-type: none"> <li>• Database basics</li> <li>• Normalization</li> <li>• Entity Relationship diagrams</li> <li>• SQL</li> </ul>	<b>11.3A Algorithms and data structure</b> <ul style="list-style-type: none"> <li>• Structure of one-dimensional and two-dimensional arrays</li> <li>• Search and sort algorithms</li> <li>• Efficiency of algorithms</li> </ul>	<b>11.4A Programming system</b> <ul style="list-style-type: none"> <li>• Project development</li> </ul>
<b>11.1B Programming paradigms</b> <ul style="list-style-type: none"> <li>• Classification and categories of programming languages</li> <li>• Translators</li> </ul>	<b>11.2B Designing a new system</b> <ul style="list-style-type: none"> <li>• Data flow diagram</li> <li>• Flowcharts</li> <li>• Prototyping</li> <li>• Advantages and restrictions of system</li> <li>• Development environment</li> <li>• Technical specification</li> </ul>	<b>11.3B Web programming</b> <ul style="list-style-type: none"> <li>• HTML markup language</li> <li>• CSS stylesheet</li> <li>• Script language</li> <li>• Using scripts to create site content</li> </ul>	<b>11.4B Information security</b> <ul style="list-style-type: none"> <li>• Security, privacy and data integrity</li> <li>• Safety device</li> <li>• Validation and verification</li> <li>• Blockchain technology</li> <li>• Ethics and ownership</li> </ul>
<b>11.1C System lifecycle</b> <ul style="list-style-type: none"> <li>• System lifecycle stages</li> <li>• System lifecycle model</li> <li>• Dataflow diagrams</li> <li>• Flowcharts</li> </ul>		<b>11.3C Mobile applications development</b> <ul style="list-style-type: none"> <li>• Application interface</li> <li>• Mobile application development</li> <li>• Publishing mobile application</li> </ul>	<b>11.4C Communication and networks</b> <ul style="list-style-type: none"> <li>• Computer networks</li> <li>• Principles of Internet operation</li> <li>• Protocols</li> </ul>

# 11.1A - Computer systems

Software categories.  
Application software

# Learning objectives

- justify the choice of software and selection criteria for specific purposes
- classify application software

## Assessment criteria

- defines different types of software
- justify the choice of software for specific purposes
- classify application software by the types
- describes the purpose of using software for different cases

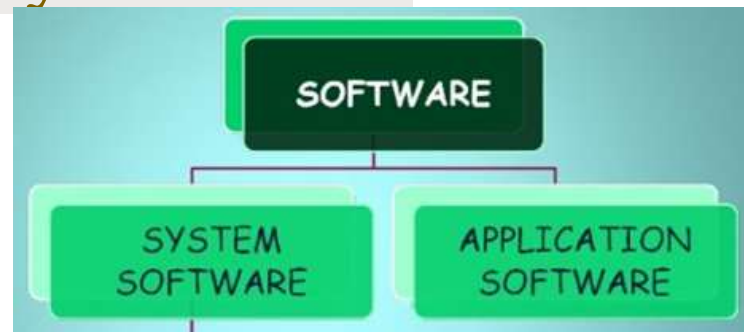


Let's remember...

## What is Software?

Software is a program which consists of a set of instructions that tell the computer how to perform a specific operation

What types of software do you know?





Let's remember...

What is System Software?

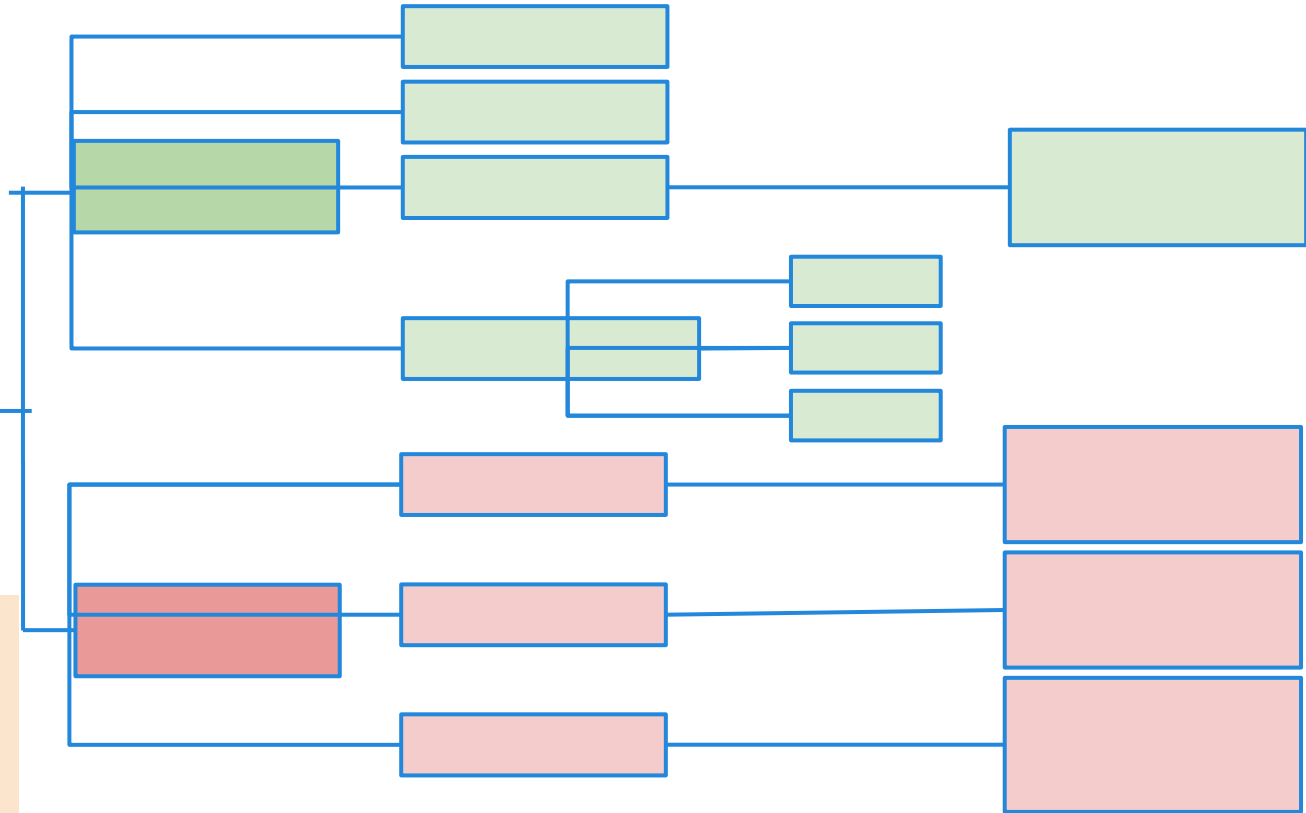
...software designed to operate the computer hardware  
and to provide a platform for running application  
software

What is Application software?

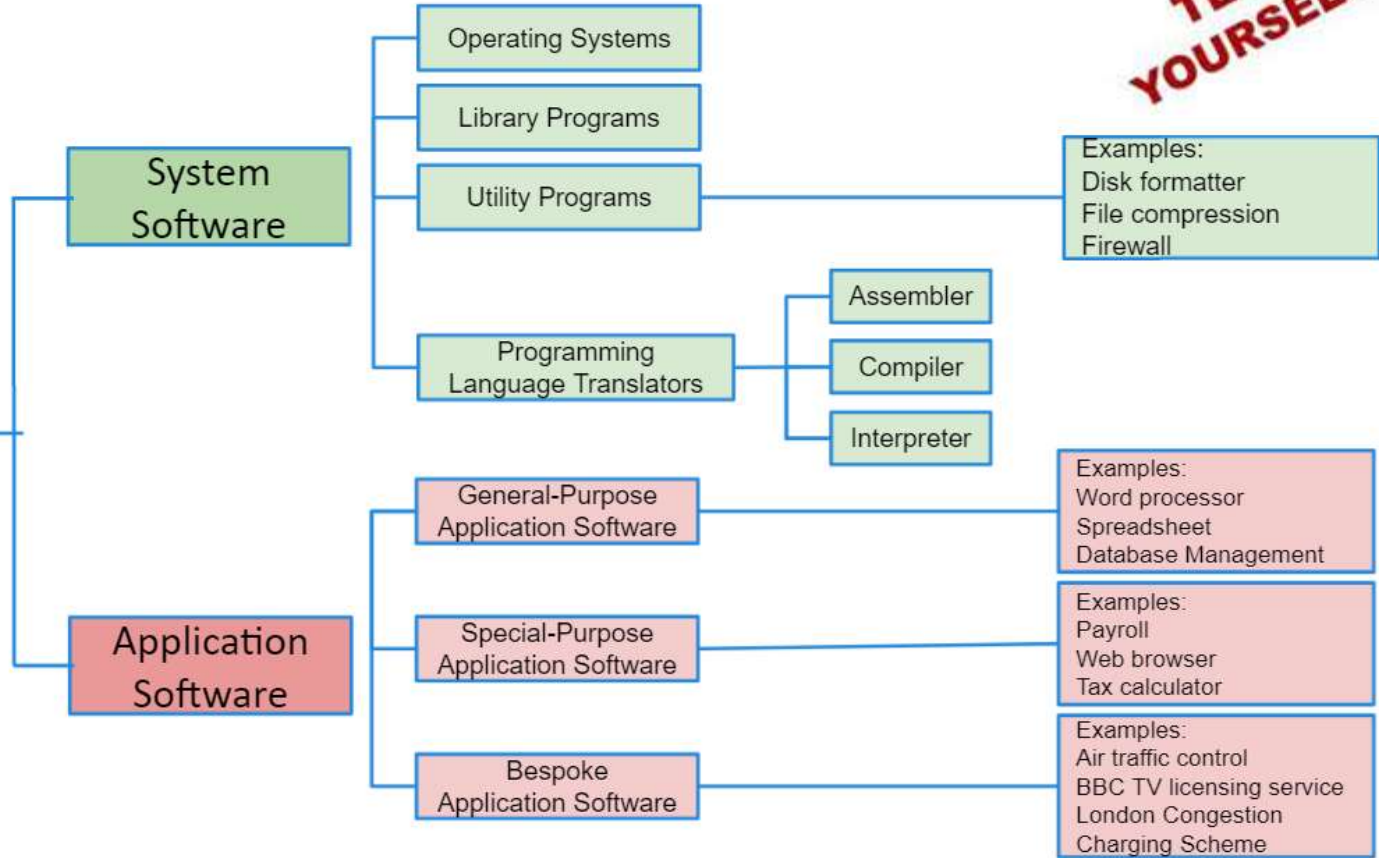
...software designed to help the user to  
perform specific tasks

## Software

- Defines two types of software
- Determines which type of software the utility belongs to
- Determines which type of software the custom-made program belongs to
- Give examples of types of software



# Software

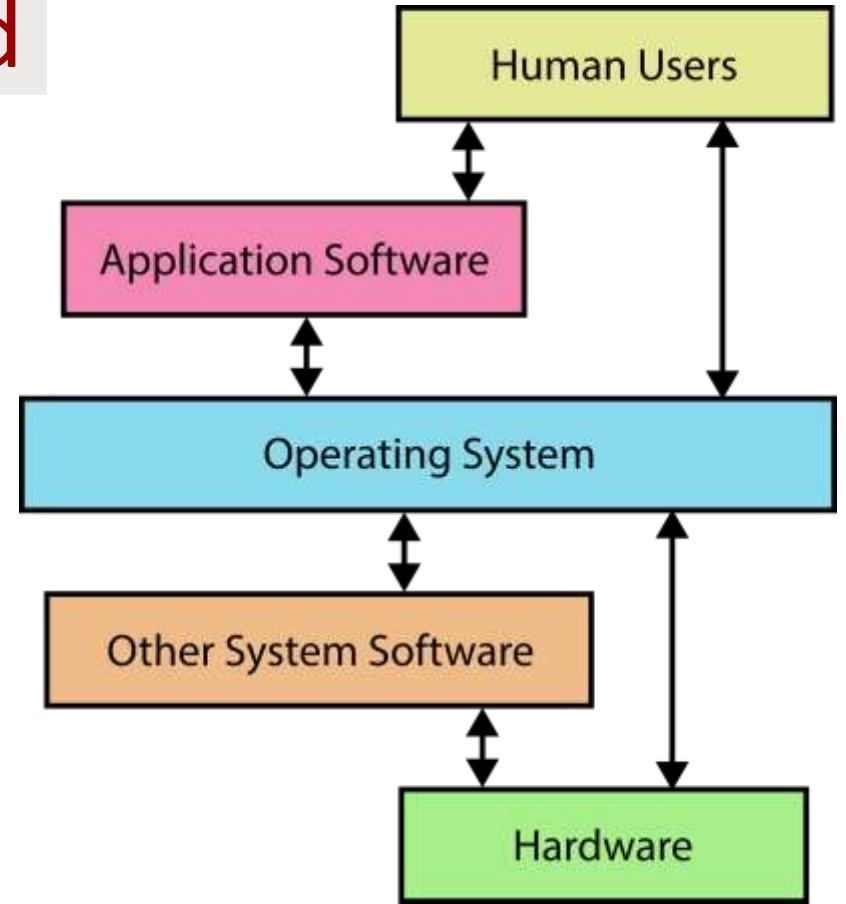


**TEST YOURSELF!**





How do you understand the diagram?

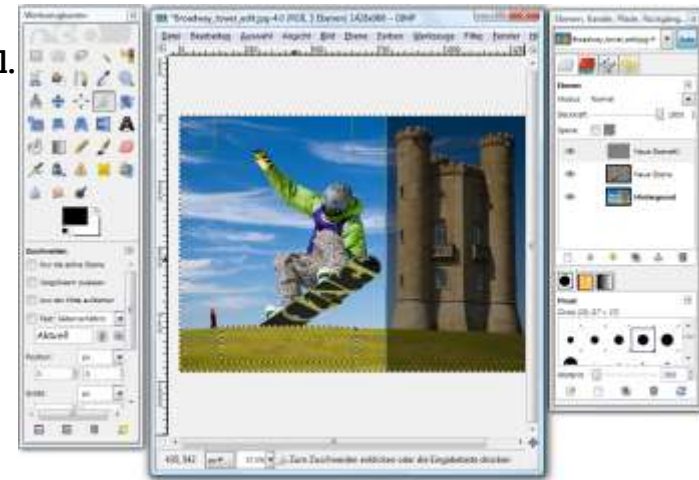


# Application Software

- It allows users to perform non-computer tasks
- It is a software designed to help the user to perform specific tasks, such as writing a letter or processing orders
- It is designed for end users to perform tasks that they consider useful.

For example:

- The ability of a scientist to work out statistical information using a set of results
- Someone who wants to play the latest computer game
- Categories of Application software:
  - General purpose application software
  - Special purpose application software
  - Bespoke application software

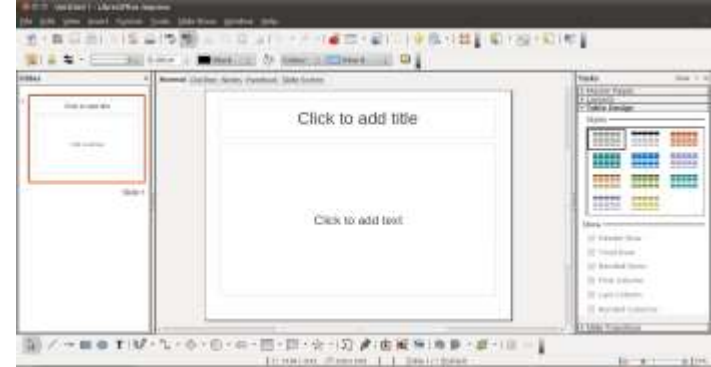


# Bespoke Software

- Bespoke software is taylor made for a specific user and purpose. For example:
  - A factory may require software to run a robot to make cars, however, it is the only factory making that car in the world, so the software required would have to be specially built for the task.
- Other examples:
  - Software for the military
  - Missile/UAV operations
  - Software for hospitals and medical equipment
  - Software being written inside banks and other financial institutions

# General-Purpose / Generic Software

- General-purpose software is a type of software that can be used for many different tasks.
- It is not limited to one particular function.
- For example a word processor could be classed as general purpose software as it would allow a user to write a novel, create a restaurant menu or even make a poster.
- Example applications:
  - Word processors
  - Spreadsheet
  - Presentation software



# Special purpose application software

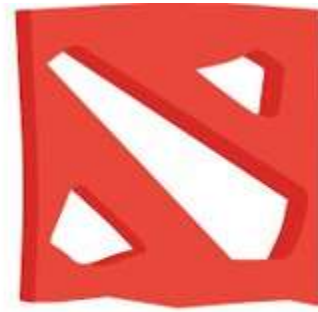
- It is a type of software that created to execute one specific task.
- For example:
  - A camera application on your phone will only allow you to take and share pictures.
  - A chess game would only allow you to play chess.
- Other examples of special purpose application software:
  - Web Browsers
  - Calculators
  - Media Players
  - Calendar programs, etc.



# Distribute the software icons by category

System software

Application software



DOTA 2



# Think and answer... (3min)

- What do you know about System Software?
- What are the differences between the types of system software?

# System software

- It is a software designed to operate the computer hardware and to provide a platform for running application software
- It performs the tasks needed to operate the hardware.
- Example:
  - Operating system softwares
  - Utility programs
  - Library programs
  - Translator software



# Operating System (OS)

- Operating Systems are a collection of programs that make the computer hardware conveniently available to the user
- It hides the complexities of the computer's operation
- OS interprets commands issued by application software (e.g. word processor and spreadsheets)
- It 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. **EXAMPLES ?**

# Reflection

- Open link and share your opinion about 1st part of the lesson

<https://forms.gle/ckHcxfekYEULcLwj6>

# HOW COMPUTERS WORK

HARDWARE  
&  
SOFTWARE



# Library Programs

- A library program is a collection of compiled routines that other programs can use.
- It contains code and data that provide services to other programs as
  - interface (look and feel)
  - printing
  - network code
  - the graphic engines of computer games
- All Microsoft Office programs have the same look and feel because they are using the same graphical user interface libraries.
- Computer game developers often buy graphical libraries to speed up development
- This will allow them to quickly develop a good looking game that runs on the desired hardware
- For example Battlefield 3 and Need for Speed both use the same Frostbite engine.

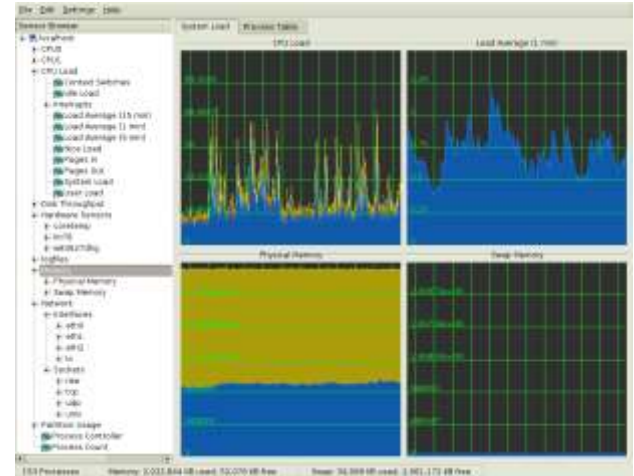


# Activity

- In pairs, quickly discussed two utility software that you have used before.
- Explain what it does and how it is useful.
- Give some reasons why you choose it over other products.
- Share with the class.

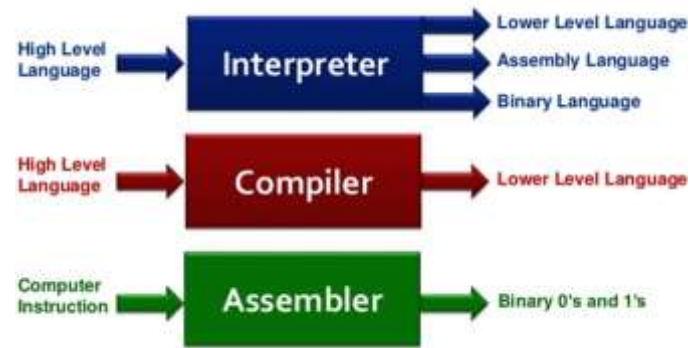
# Utility Softwares

- Utilities are programs that perform a very specific task related to working with computers
- They are small, powerful programs with a limited capability
- They are usually operated by the user to maintain a smooth running of the computer system
- Examples of utility software include:
  - *Virus scanner*- to protect your system from trojans and viruses
  - *Disk defragmenter*- to speed up your hard disk
  - *System monitor*- to look at your current system resources
  - *File managers*- to add, delete, rename and move files and folders
- There are also other types that can be separately installable from the Operating System.



# Translator Software

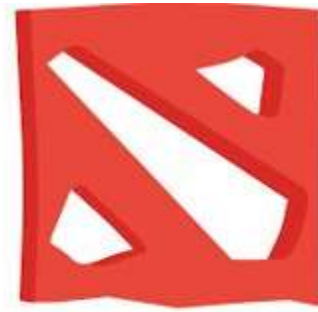
- It is a software that allows new programs to be written and run on computers, by converting source code into machine code.
- There are three types:
  - ***Assembler*** is a program that translates an assembly language program into machine code
  - ***Compiler*** is a program that takes a program in a high-level language, the source code, and translates it into object code all at once.
  - ***Interpreter*** analyses and executes each line of a high-level language program one line at a time. (program has to be interpreted each time it is run as no object code is generated)



# Distribute the software icons by category

System software

Application software



DOTA 2

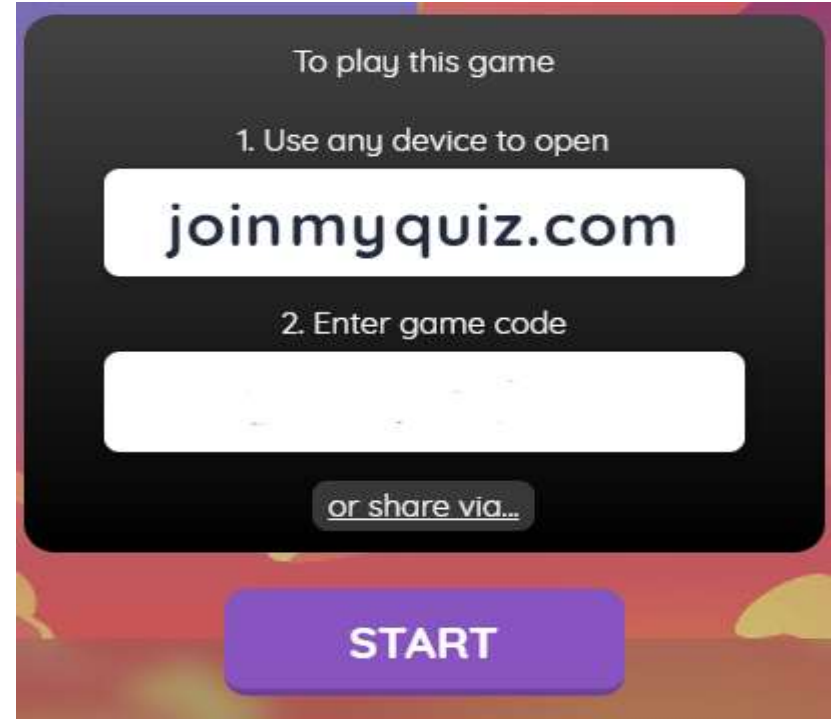




# Activity 1

descriptors:

- understand functions of OS
- classify categories of software
- gives examples of different category of software



# Answer Questions in Group ( 5 min )

- Why is bespoke software more expensive to buy than off-the-shelf software?
- Which of the following is general-purpose software and which is special-purpose software?
  - a spreadsheet, an accounting package, a presentation package, a photo editor
- What is meant by application software?

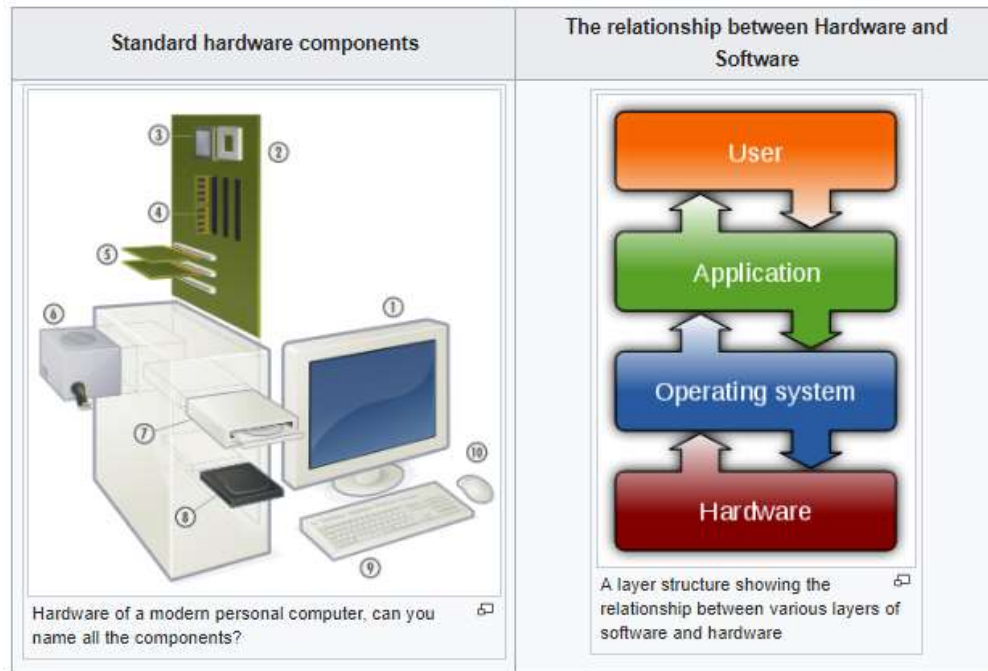


**What do you know about Off-the-shelf?**

**Hardware** - Physical components that make up a computer system

**Software** - Computer programs and related data that provide the instructions for telling computer hardware what to do and how to do it

Hardware and Software have a *symbiotic* relationship, this means that without software hardware is very limited; and without hardware, software wouldn't be able to run at all. They need each other to fulfill their potential.



**Application software** - software designed to help the user to perform specific tasks



Application software is designed for people like me and you to perform tasks that we consider useful. This might be the ability of a scientist to work out statistical information using a set of results, or someone who wants to play the latest computer game. There are several categories of Application software that we'll look into shortly:

- General purpose application software.
- Special purpose application software.
- Bespoke application software

# Exam style questions

(c) Aaron's computer has a virus checker and backup software.

Describe these utility programs.

Virus checker .....

.....

.....

.....

Backup software .....

.....

.....

.....

[4]

Question	Answer	Marks
2(c)	<p><b>1 mark</b> per bullet point to <b>max 3</b> for each utility program, <b>max 4</b> in total</p> <p>Virus checker:</p> <ul style="list-style-type: none"> <li>∞ <b>Scans</b> files stored on a <b>computer system</b> for malicious code</li> <li>∞ Scans files when they <b>enter the system</b> / memory stick inserted / download etc.</li> <li>∞ Sets up a schedule for virus-checking</li> <li>∞ Isolates / quarantines / deletes viruses</li> <li>∞ Regularly updates the virus definitions</li> </ul> <p>Backup software:</p> <ul style="list-style-type: none"> <li>∞ Creates a copy of the contents of a disk / partition. Can be set up to automatically backup // schedules backups</li> <li>∞ Allows the user to decide what is backed up, e.g. all data // all files that have changed since the last backup</li> <li>∞ Allows the user to set up an off-site backup</li> <li>∞ May encrypt the backup files</li> <li>∞ Restores the data if necessary</li> </ul>	<b>4</b>



- (a) The diagram shows different types of software on the left, and descriptions on the right.

Draw a line from each type of software to its correct description.

Type of software	Description
Operating system	Provides a ready-built routine that can be imported into a program
Utility program	Provides an interface between the user and the hardware
Library program	Converts source code into a low-level language
Compiler	Creates a new document for the user to edit
	An additional program that helps to maintain or configure the system

# Reflection

- Open link and share your opinion about 1st part of the lesson

<https://forms.gle/ckHcxfekYEULcLwj6>