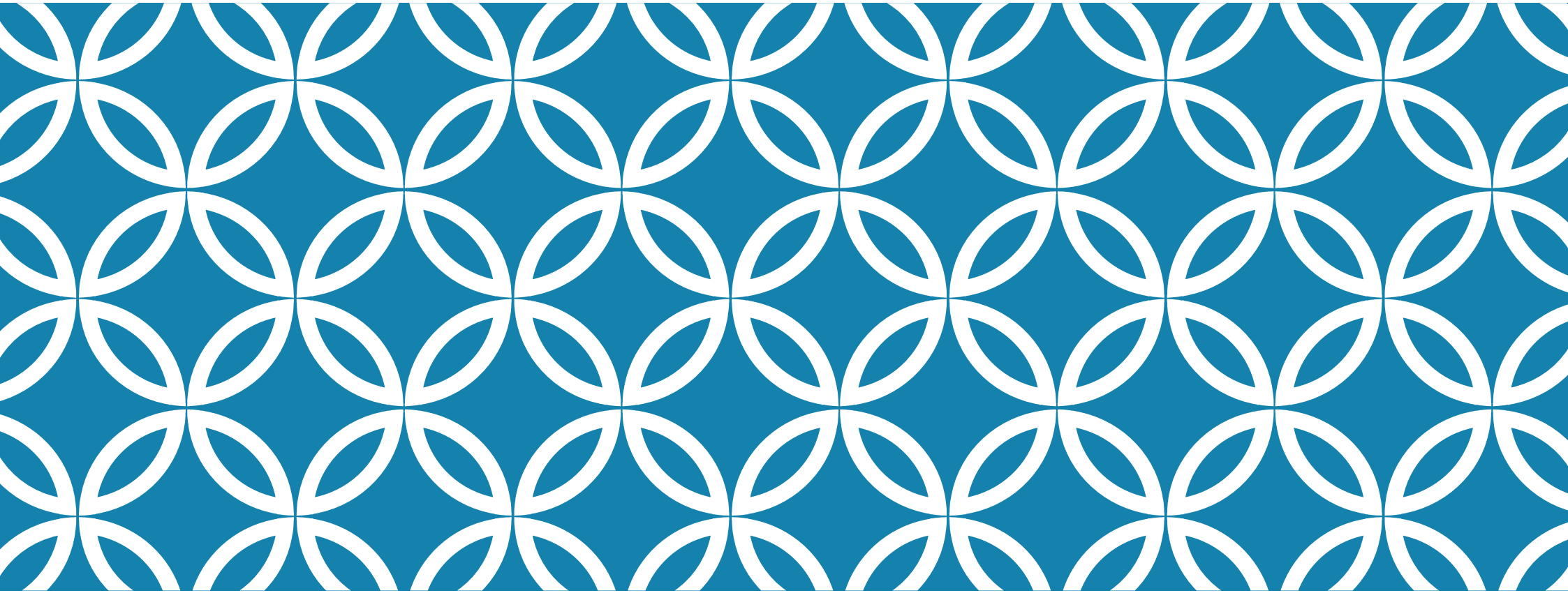
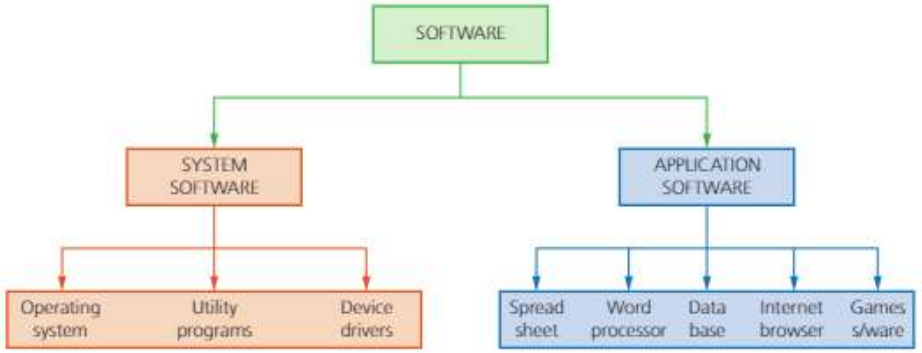


SOFTWARE

Chapter 4

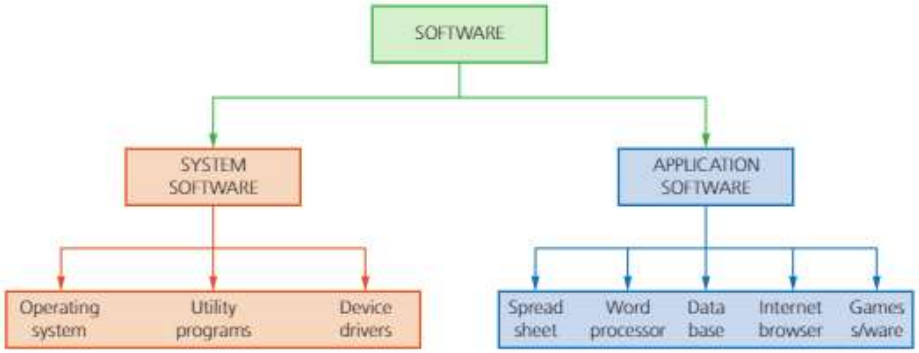
SYSTEM SOFTWARE AND APPLICATION

- General features of system software
  - Set of programs to control and manage the operation of computer hardware
  - Provides a platform on which other software can run
  - Provides a human computer interface (HCI)
  - Controls the allocation and usage of hardware resources
  - Managing memory
  - Multitasking
  - Handling interrupts
  - Providing system security
  - Managing user accounts



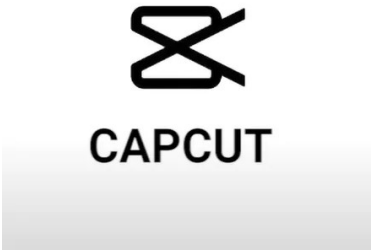
SYSTEM SOFTWARE AND APPLICATION

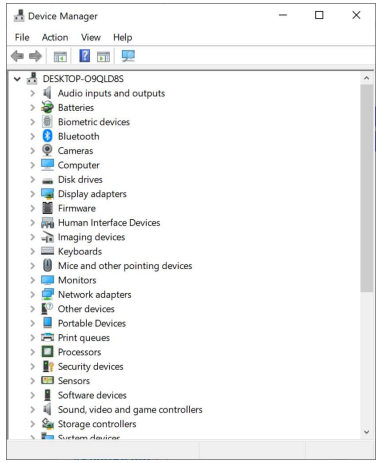
- General features of application software
  - Allows a user to perform specific tasks using the computer's resources
  - May be a single program (for example, NotePad) or a suite of programs (for example, Microsoft Office)
  - User can execute the software as and when they require.



SYSTEM SOFTWARE AND APPLICATION

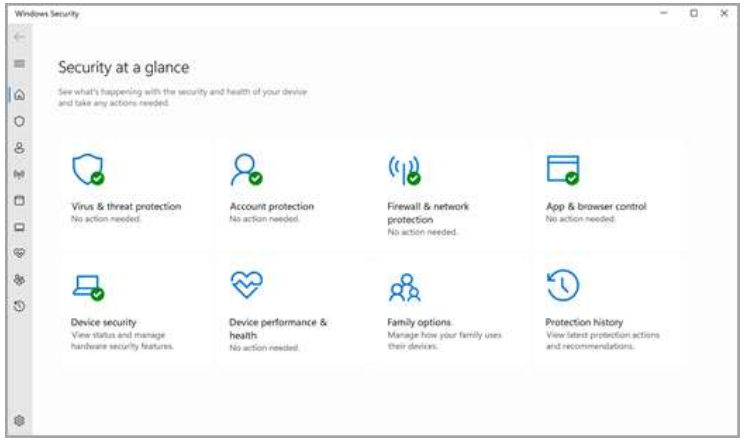
- Examples of application software
  - Word processor
  - Spreadsheet
  - Database
  - Control and measuring software
  - Photo/video editing software
  - Graphic manipulation software
- Examples of system software
  - Operating systems (OS)
  - Compilers
  - Device drivers
  - Utility software

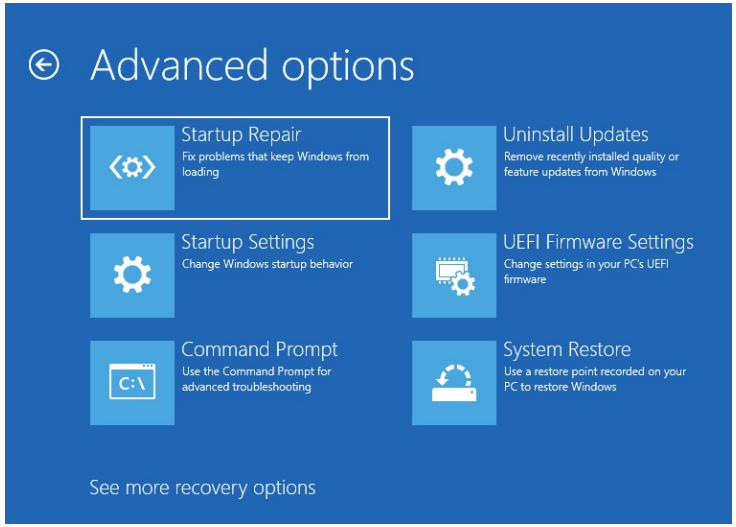




UTILITY SOFTWARE

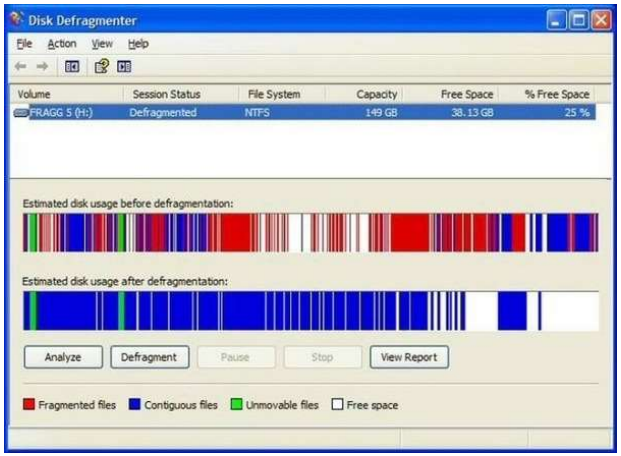
- They are programs that help to manage, maintain and control computer resources
- Virus checkers
  - It scan files and compares with the database that contain information of know virus
  - If it detects some behaviour that could be indicate a possible virus, the virus checker could quarantine, clean or delete the file
- Backup utility
  - To make a copy of data and store it in different medium. In case, the running storage breaks down
  - It allows a schedule for backing up files. Hourly, daily, monthly, yearly

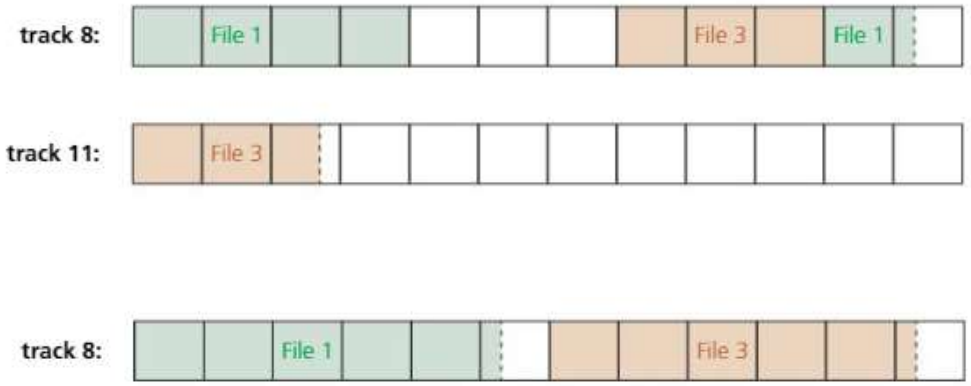




UTILITY SOFTWARE

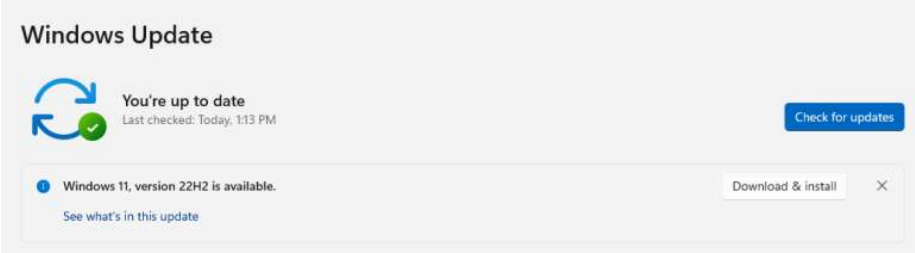
- Disk defragmenter
  - Since in use disk becomes gradually less efficient because files are created, moved, delete which leads to incontiguous state.
  - Disk defragmenter reorganizes the file storage to return it to a state where all files are stored in contiguous state





SECURITY SOFTWARE

- Security software
  - manages access control and user accounts (using user IDs and passwords)
  - links into other utility software, such as virus checkers and spyware checkers
  - protects network e.g. firewall
  - uses encryption and decryption to ensure any intercepted data is meaningless without a decryption key
  - oversees the updating of software (does the update request come from a legitimate source, for example).

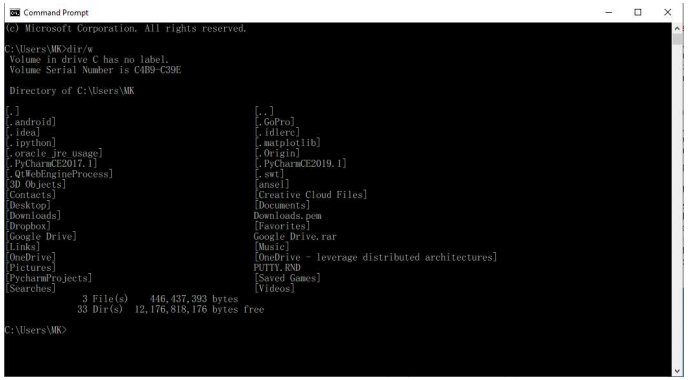


OPERATING SYSTEMS

- Provides a platform on which other software can run
- Provides a human computer interface (HCI)
- Controls the allocation and usage of hardware resources
- Managing memory
- Multitasking
- Handling interrupts
- Providing system security
- Managing user accounts

OPERATING SYSTEMS

- Human computer interface (HCI)
  - Command Line Interface (CLI)
  - Graphical User Interface (GUI)

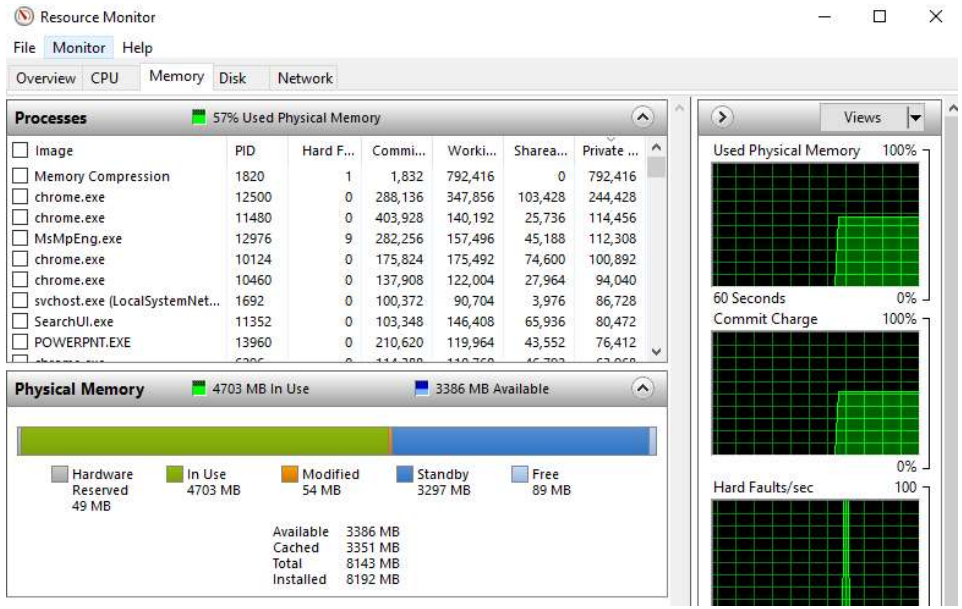


	Command Line Interface (CLI)	Graphical User Interface (GUI)
Advantages	- Efficient and precise for technical users	- User-friendly
	- Require less memory	- Windows, icons, menu and pointing device
	- More instructions by combining instructions	- Less error because using pointing device
		- Faster than typing
Disadvantages	-Take more time to learn	- Require more memory
	- Typing is slower than clicking	- Limited instructions
	- Easier to make errors	

▲ **Figure 4.8** GUI icons on a mobile phone

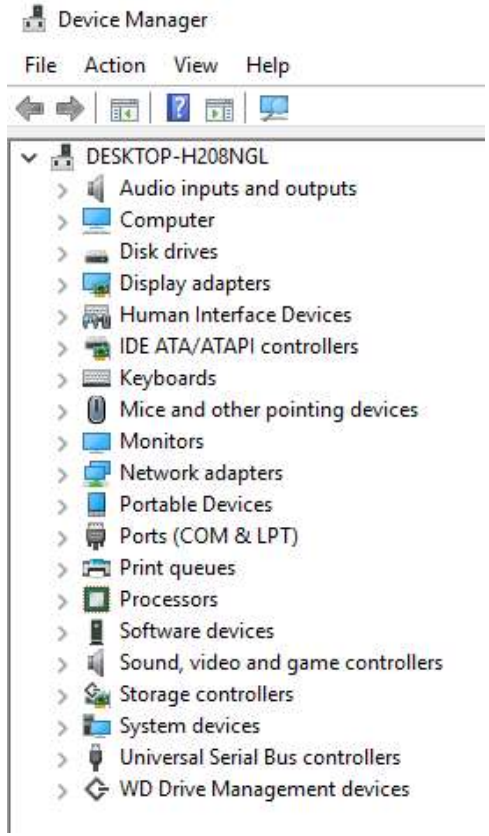
OPERATING SYSTEMS

- Memory management
  - Manage what data should be in RAM or HDD/SSD
  - Keeps track of all the memory locations
  - Carries out memory protection to ensure that two competing applications cannot use the same memory locations at the same time



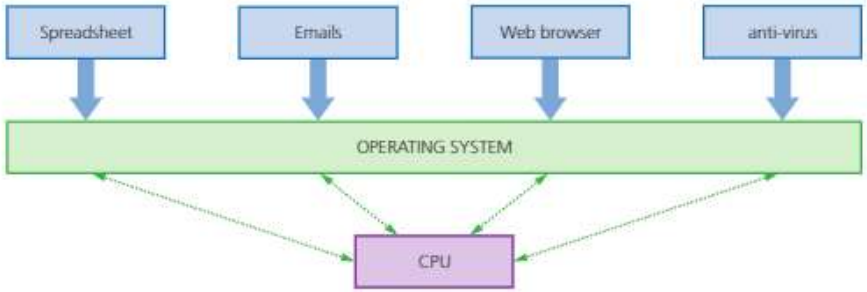
OPERATING SYSTEMS

- Device driver
  - every computer has a variety of components that are called as ‘device’ e.g. keyboard, mouse, monitor and printer.
  - OS installs correct ‘driver’ to allow those devices work correctly
    - Driver is a program that allow computer systems to control and work with additional devices correctly
    - Drivers translate data from the OS into a format that device can understand
  - Send data to device
  - Receive data e.g. interrupt signal from a device
  - Send control signal to devices
  - Manage interrupt signal from hardware



OPERATING SYSTEMS

- File management
  - File name conventions
  - Delete, copy, paste, open, close
  - Maintaining the directory structures
  - Access right (read/write/execute)
- Multitasking
  - Allows computers to run more than one applications at a time
  - Multitasking will manage:
    - resources are allocated to a process for a specific time limit
    - the process can be interrupted while it is running
    - the process is given a priority so it can have resources according to its priority



INTERRUPTS

- It is a signal from a device or a software to temporarily stop what processing is working once processor receives interrupts signal, processor has two options. Continue working or stop to service device or software that generated the signal
- interrupts allow computers to perform multitasking
- example of interrupts:
  - an error of a software
  - out of paper error from printers
  - ctrl + alt + delete
- When an interrupt is received, the current task will be saved and then interrupt service routine(ISR) I executed

QUESTIONS

- State three features of a typical operating system

- Personal computers (PCs) use an operating system. Explain why this type of computer needs an operating system.

QUESTIONS

- Describe the purpose of an interrupt in a computer system

Statement	True (✓)	False (✓)
Interrupts can be hardware based or software based		
Interrupts are handled by the operating system		
Interrupts allow a computer to multitask		
Interrupts work out which program to give priority to		
Interrupts are vital to a computer and it cannot function without them		