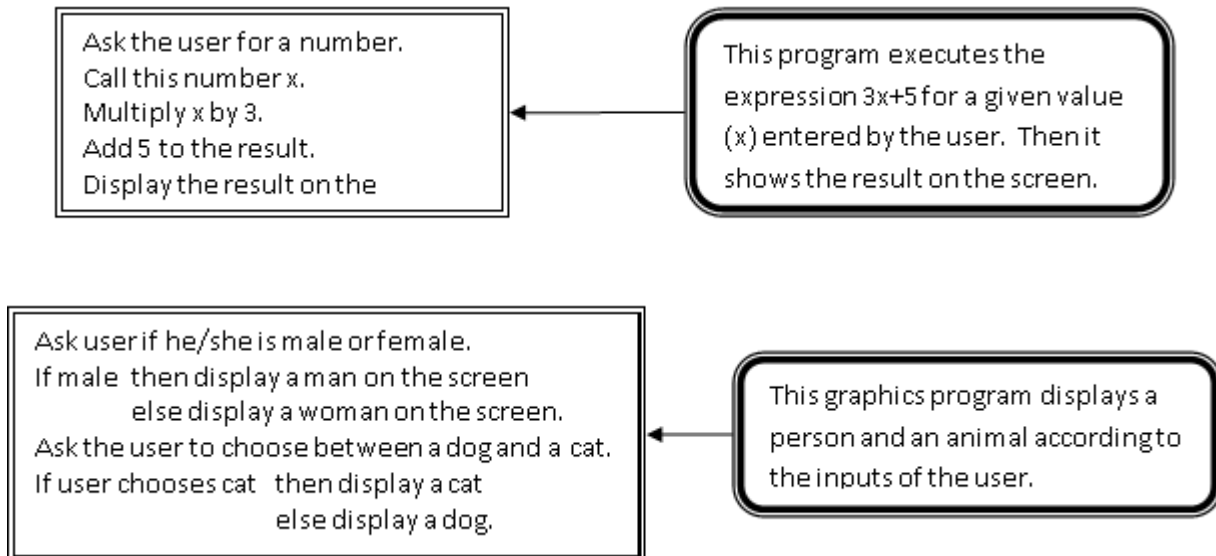


Useful Terms

Program

A program is a sequence of instructions.



Data and Information

Data consists of the values that we enter as input for example if we want to calculate the volume of a cylinder and we enter 4cm (height of cylinder) and 1.5cm (radius of the base) then 4 and 1.5 are the data.

Data represents unorganized and unprocessed facts. Example of data: marks of computing of a class (from which the average is required).

Information can be considered as processed data (which makes decision-making easier). Information has got meaning and purpose. Example of information: the average mark.

In practice however the terms 'data' and 'information' are often used interchangeably.

Hardware and Software

Consider these two examples:

	Can be touched	Cannot be touched
Music	Instruments	Song
Reading	Book	Story

Similarly, in computing:

	Hardware (can be touched)	Software (cannot be touched)
Examples	Screen, Keyboard, Pen drive	A word processor A game A list of names

Software consists of programs and data.

Programs are divided in application software and system software. Application software consists of the programs for the user's needs while system software consists of programs required for the computer to run. Examples of application software are word processor, spreadsheet, a game and web browser, etc. System software consists of e.g. an antivirus etc.

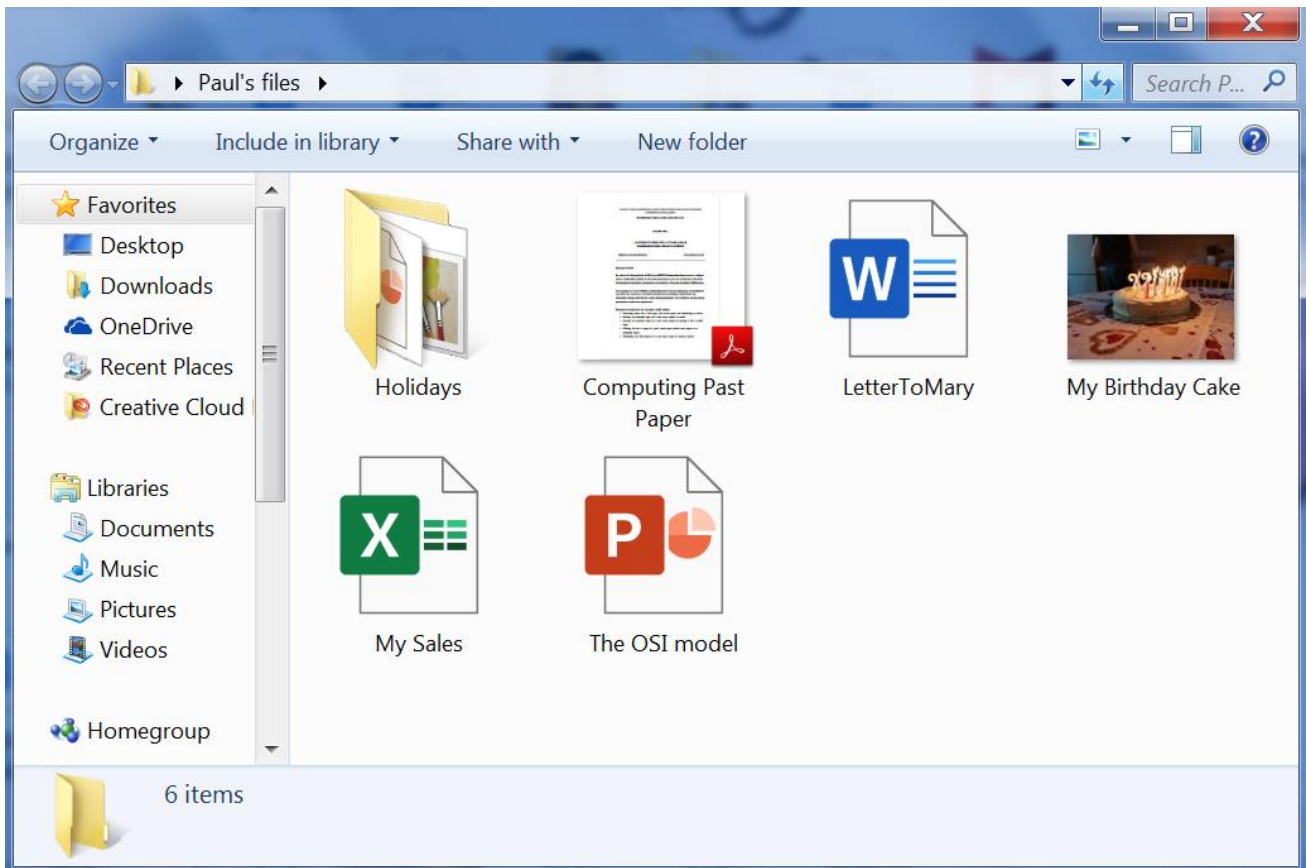
A software package consists of a number of programs that work together and are bundled and sold together.

What is a File?

A file is a collection of data. This collection of data has a name.

The diagram below shows a folder containing six different files:

- 'Letter to Mary' is a word-processing file made up of a collection of alphanumeric characters and punctuation characters. It can be seen as made up of words, sentences and paragraphs.
- 'My Birthday Cake' is a photo made up of a collection of pixels.
- 'The OSI model' is a Presentation file made up of a collection of slides.
- 'My Sales' is a spreadsheet program made up a collection of cells each containing a label, number, date, formula etc.
- 'Computing Past Paper' is a file containing a collection of questions and answers.
- 'Holidays' is a file, called a folder, that contains a collection of files.

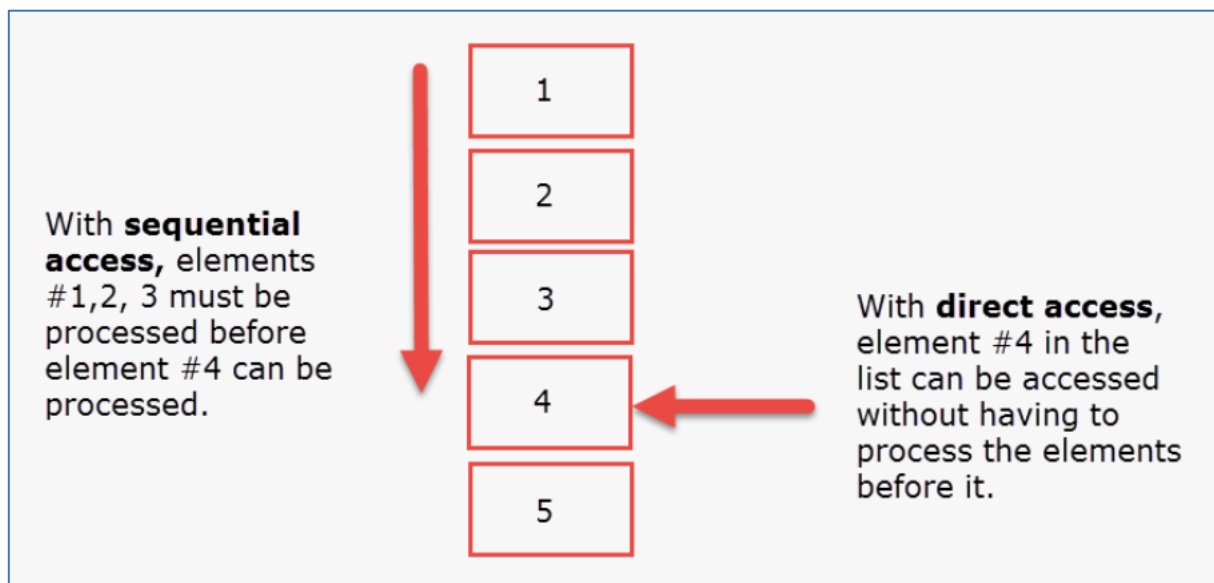


Sequential and Direct File Access

Sequential access: file is read from the beginning.

Direct access: file can be read starting from anywhere inside it.

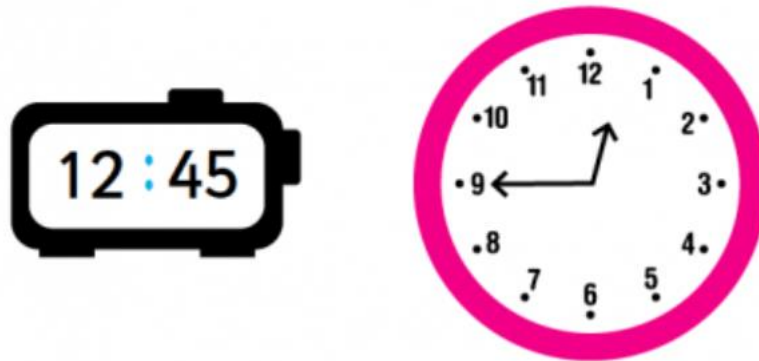
A tape can only hold sequential files. A hard-disk can hold both sequential and direct access files.



Some situations require that we create files that are sequential e.g. payroll. Other situations require files to be random e.g. airline booking reservations.

Sequential files are also called 'serial'. Direct files are also called 'random'.

Analogue vs Digital



Digital means discrete (not continuous) i.e. in steps e.g. the digital clock on the left never shows seconds, it moves in steps of minutes. Analogue means 'continuous'. The arms of the analogue clock on the right show the exact time.

Hard Copy and Soft Copy

A document held on your computer is said to be a 'soft copy'. When this document is printed you have a 'hard copy'.

Bit, Byte, Kilobyte

Bit is short for a 'binary digit', meaning each bit is really just a single number: either a one or a zero. Computers work with bits.

A bit can be stored by (for example):

- two distinct voltages
- two distinct levels of light intensity
- two directions of magnetization

A sequence of 8 bits is called a byte. A kilobyte is equivalent to 2^{10} bytes (1024 bytes). See the following table:



Kilobyte = 2^{10} bytes = 1,024 bytes

Megabyte = 2^{20} bytes = 1024×1024 bytes = 1,048,576 bytes

Gigabyte = 2^{30} bytes = $(1024)^3$ bytes = 1,073,741,824 bytes

Terabyte = 2^{40} bytes = $(1024)^4$ bytes = 1,099,511,627,776 bytes

Question: A file consists of 3 kilobytes. How many bytes does it have, and how many bits?

Serial and Parallel Transmission

In serial transmission the bits to be transmitted are sent one after the other on the same line.

In parallel transmission the bits are sent on different lines at the same time.

