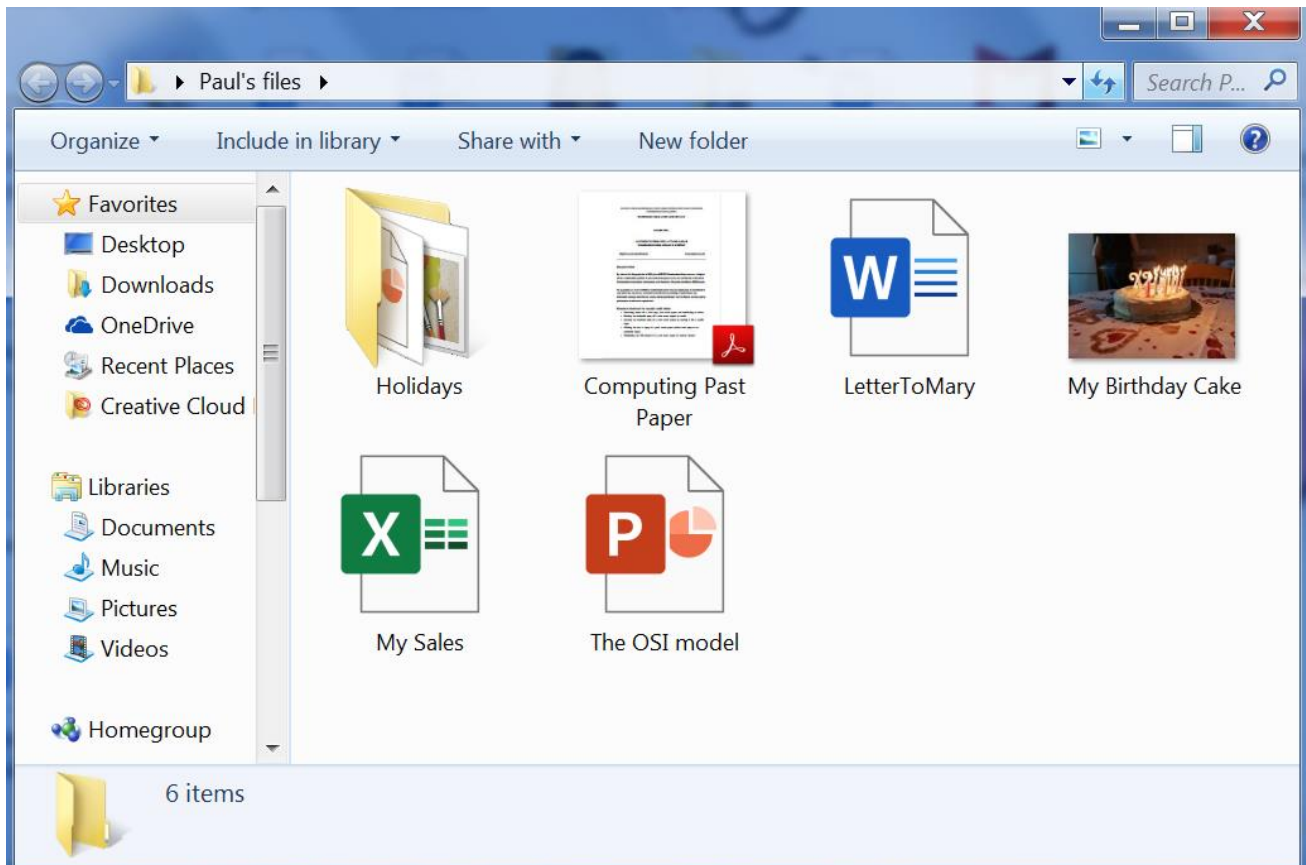


Databases

What is a File?

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



In the folder above there are 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.

A file can also contain records. A **record** is a collection of fields. Each **field** contains a single information. The information in the fields can be of a different **type**. The following diagram shows two records – one shows the information of a person for a sports club and the other shows the information of a person for a bank.

ID No.	Surname	Name	Address	Town	Mobile No.
834512M	Borg	Paul	2, Church Square	Floriana	213000

ID No.	Account No	Surname	Name	Amount
748928M	S347AZ	Zammit	Mario	2968.14

A **table** is a collection of records. The following diagram shows a table consisting of four records.

ID No.	Surname	Name	Address	Town	Mobile No.
834512M	Borg	Paul	2, Church Square	Floriana	213000
536209M	Spiteri	John	39, Airport Road	Mdina	539266
243522M	Caruana	Jade	7, Beach Street	Luqa	243001
276121M	Magro	May	10, Grove Road	Safi	271118

A table can have fixed-length records and variable-length records. In a **fixed-length records** table all the records have the same number of fields and all corresponding fields have the same number of characters e.g. all records have the third field that has 10 characters and the fourth field that has 20 characters. In a **variable-length records** table the records can vary in length e.g. one record can have more fields than the others or a field can have different lengths for different records. The following two tables contain variable-length records.

ID No.	Surname	Name	Date of birth	Date of death
834512M	Borg	Paul	23/12/1912	04/05/1988
536209M	Spiteri	John	02/02/1909	04/12/1972
243522M	Caruana	Jade	13/10/2022	
276121M	Magro	May	04/07/2021	12/02/2001

Some records have five fields while one other has four.

2	3	1	9	5	M	O	R	E	J	O	E							
1	9	6	7	7	M	I	C	A	L	L	E	F	G	E	O	R	G	E
8	2	0	8	3	S	A	I	D	J	A	N	E						

Records in this table have three fields but the length of the content varies.

Advantage of fixed-length records:

- From a programming point of view, it is easier to manipulate records.

Disadvantage of fixed-length records:

- All values inside a field have to take the space of the longest value.

Variable-length records advantage:

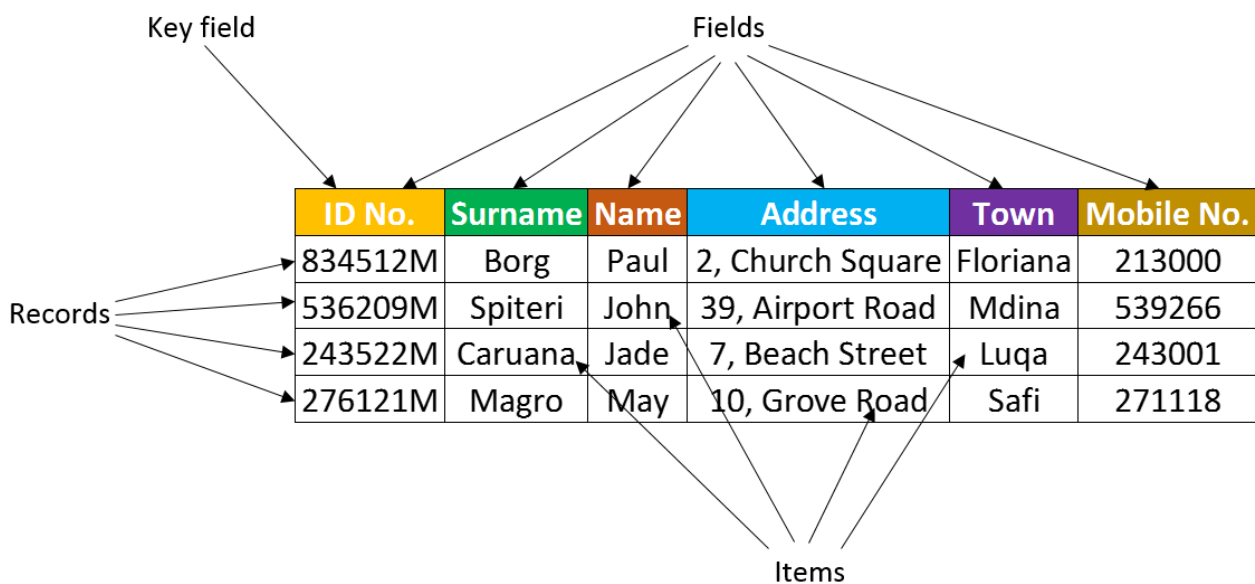
- No memory is wasted.

Variable-length disadvantage:

- Programming is more difficult.

The content within a field is called **item**.

A **key field** (also called **primary key**) has a unique value. It represents the whole record e.g. the ID number is a primary key.



A **database** consists of a number of tables in which records are related e.g. if a database consists of two tables called PATIENTS and DOCTORS, then for a patient we can know her doctor or doctors. Likewise, we can know all the patients of a particular doctor.