

## 7 – Data Structures and Abstract Data Types

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A data structure is any method used to store data in an organised manor that makes the data accessible. Normally, a data structure should contain related data.

### Arrays

Arrays are ordered collections of elements. The elements are usually of the same type (homogeneous) but can be of different types (this is the usual distinction between a list and an array) called heterogeneous structures.

### Files (binary and text)

Files are collections of data stored on a storage device under a single identifying name. Although all files ultimately consist of bits, a text file is distinguished as different as these bits are required to represent ASCII characters which means certain shortcuts and assumptions can be made when working with them.

### Static and dynamic data structures

A static data structure is one that occupies a fixed amount of memory. They are less efficient and less flexible than dynamic data structures which can allocate more memory from a heap (and return unused memory to the heap). Different data structures such as queues (FIFO) and stacks (FILO) can be implemented as both types.

The advantage of using a static data structure is that they are faster, however dynamic structures are more flexible.