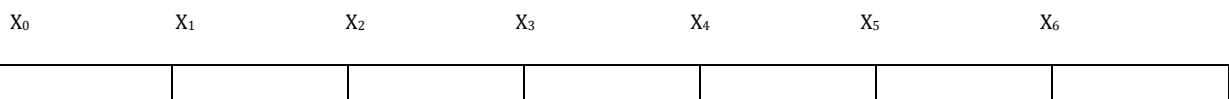


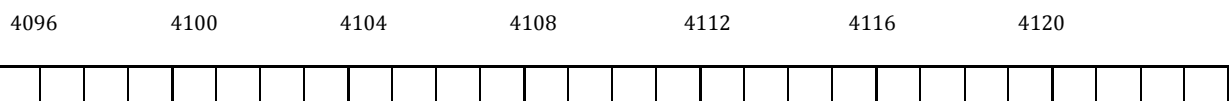
Arrays

The value of computers to modern society comes from their ability to store and efficiently process large volumes of information. Arrays are simple data structures¹ that can be used to store large amounts of data. All programming languages provide a means of defining and manipulating arrays.

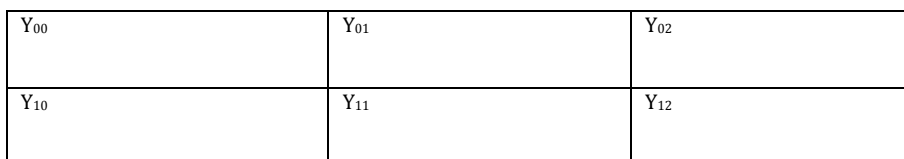
Arrays may be of one or more dimensions and they are made up of variables of one data type. A one-dimensional array can be thought of as an enumerated list. When a one-dimensional array is declared in an executing computer program, memory is allocated so that the array values are stored in contiguous memory, as illustrated in the following diagram in which X is illustrated as an array with seven elements.



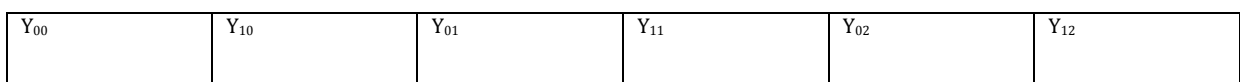
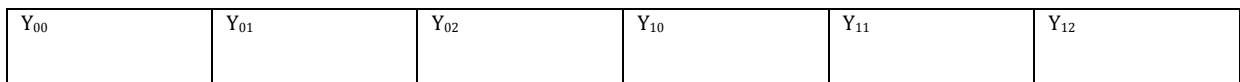
Note the subscripts next to each occurrence of the identifier X. In some programming languages – such as C or Java – the first subscript is zero, in other languages – such as Fortran or Pascal – the initial subscript is one. Every element of the array has the same type and hence they are all the same size. For example if each element was a 4 byte integer then we may think of the storage of the values in memory as follows. The enumeration shows the possible enumeration of bytes in memory.



It is usually possible to declare arrays of two or more dimensions. For example if we declare Y as a two-dimensional array; Y(2,3). Y is an array made up of 2 rows and 3 columns, as shown in the following diagram.



In computer memory a two dimensional array is either stored column by column then row by row, or the other way round, depending on the implementation of the programming language:



¹ [Data Structures](#)