PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C, C++ and JAVA:

Lesson-2: Data Structures: Arrays

Array

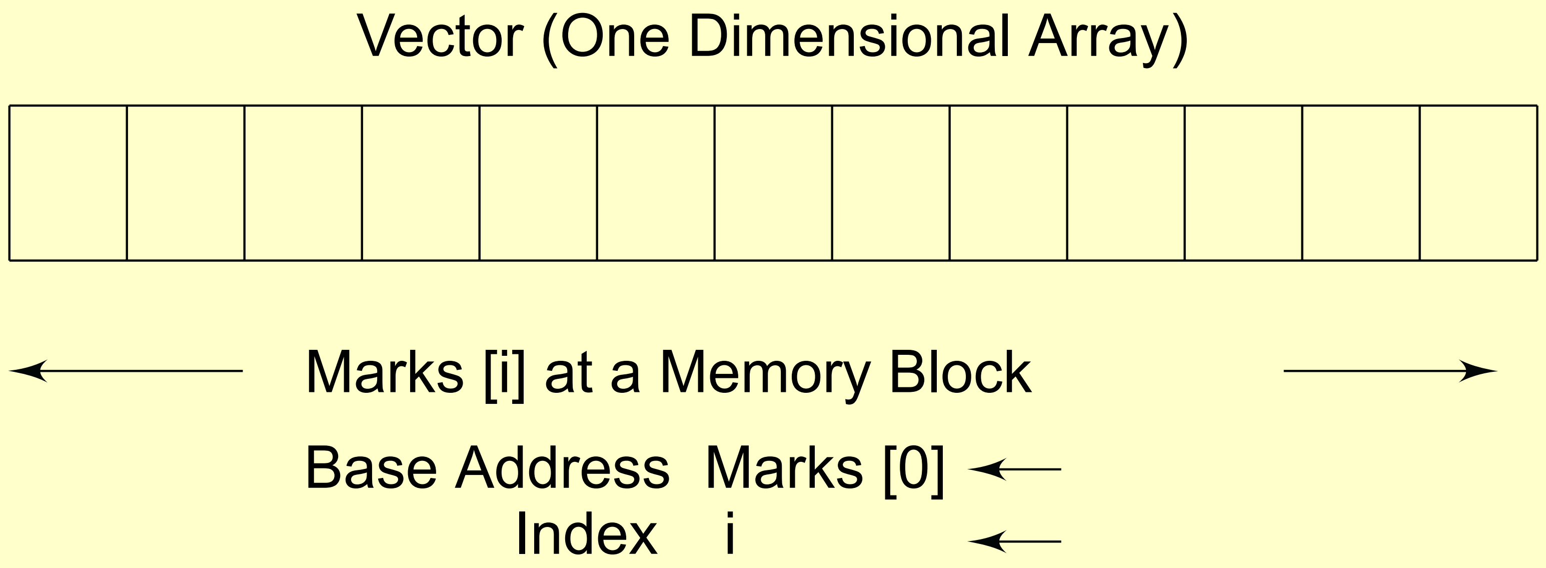
- Array: A structure with a series of data items sequentially placed in memory

Array

(i) Each element accessible by an identifier name (which points to the array) and an index, *i* (which define offset from the first element)

(ii) *i* starts from 0 and is +ve integer

An array at a memory block with one pointer for its base, first element with index = 0. Data word can be retrieved from any element by defining the pointer and index



One dimensional array (vector)

Example 1:

unsigned int *salary* [*11*];

salary [0] – 1st month salary

salary [11] – 12th month salary

Each integer is of 32-bit (4 bytes); *salary* assigned 48 bytes address space

One dimensional array (vector)

Example 2: sio *COM* [1];

COM [0]– COM1 port data record with structure equivalent to *sio*

COM [1]– COM2 port data record with structure equivalent to *sio*

COM assigned 2*8 characters = 16 bytes address space

Two dimensional array

Example 3:

unsigned int *salary* [11, 9];

salary [3, 5]– 4th month 6th year salary

salary [11, 4] – 12th month 5th year salary

salary assigned 12*10*4 = 480 bytes address space

Multi-dimensional array

Example 4:

char *pixel* [*143*,*175*, *23*];

pixel [0, 2, 5] – 1st horizontal line index *x*, 3rd vertical line index *y*, 6th color *c*.

pixel assigned 144*176*24 = 608256 bytes address space in a colored picture of resolution 144x 176 and 24 colors

Summary

We learnt

- Array: A structure with a series of data items sequentially placed in memory. Any data-element can be read or rewritten using the array pointer along with the element index(ices) in the square bracket.

End of Lesson 2 of Chapter 5