Introduction to arrays

- Array is a collection of similar datatype

- Declaring array:

    datatype arrayname[index];

Example :   int list[20];

    char num[10];

    float arr[12];

Num[0] – represents the first element in array

Num[9] - represents the last element in array

Introduction to arrays

- Contiguous memory allocation is used to store array elements

- After creating an array its size cannot be changed.

- If array size is arr[10] we cannot increase or decrease its size.

- Inserting an element at arr[11] is not possible

Initializing arrays (one dimensional array)

- Declaring, creating , initializing array

int myarray[5]={1,2,3,4,5};
int studentRegno[6];

studentRegno[0]=2100;
studentRegno[1]=2101;
studentRegno[2]=2102;
studentRegno[3]=2103;
studentRegno[4]=2104;
studentRegno[5]=2106;

Types of arrays

There are 2 types of arrays.

They are,

- One dimensional array

- Multi dimensional array
  - ➢Two dimensional array
  - ➢Three dimensional array

One Dimensional array

Example

```
#include <stdio.h>
 int main( )
{
 int val[7] = { 11, 22, 33, 44, 55, 66, 77 } ;
  for ( int i = 0 ; i < 7 ; i++ )
 {
printf("val[%d]: value is %d and address is %d\n", i, val[i]);
}
return 0;
}
```

One dimensional array - example

```c
#include<stdio.h>
 int main()
{
    int i;
    int arr[5] = {10,20,30,40,50};

    // declaring and Initializing array in C
    //To initialize all array elements to 0, use int arr[5]={0};
    /* Above array can be initialized as below also
    arr[0] = 10;
    arr[1] = 20;
    arr[2] = 30;
    arr[3] = 40;
 arr[4] = 50; */
 for (i=0;i<5;i++)
 {
        printf("value of arr[%d] is %d \n", i, arr[i]);
 }
```

Multidimensional array:

- An array of arrays is called as multi dimensional array
- Array created with more than one dimension(size)

Syntax:

datatype arrayname[rowSize][columnsize];

Example: int matrix_A[2][3];

Initialization of two dimensional array:

int matrix_A [2][3] = { {1, 2, 3},{4, 5, 6} } ; (or)

int matrix_A [2][3] = { {1, 2, 3},
                          {4, 5, 6} } ;

Two dimensional array - Example

```c
#include<stdio.h>
 int main()
int disp[2][3];
 int i, j;
for(i=0; i<2; i++)
{
 for(j=0;j<3;j++)
{
 printf("Enter value for disp[%d][%d]:", i, j);
 scanf("%d", &disp[i][j]);
}
 }
 printf("Two  Dimensional array elements:\n");
 for(i=0; i<2; i++)
{ for(j=0;j<3;j++)
 {
printf("%d ", disp[i][j]);
if(j==2)
{
 printf("\n");
 }
 }
} return 0;
 }
```

Applications of array

➢ Arrays are used to Store List of values

➢ Arrays are used to Perform Matrix Operations

➢ Arrays are used to implement Search Algorithms

➢ Arrays are used to implement Sorting Algorithms

➢ Arrays are used to implement Datastructures

THANK YOU