Paper Name: Programming Concepts

Topic: Array of Structures in C

Paper Code: BCA GE202

Semester II

By Ms. Manisha Prasad

Head, Assistant Professor,

Department of Computer Science

Patna Women's College

E – mail : manisha_prasad@yahoo.com

Array of Structures in C

In the discussion of structures in C, we learnt that structure in C is a group of variables of different data types represented by a single name. It is generally used to store information of an entity, say for example a set of information about a student. Now let us consider the following example:-

```
#include<stdio.h>
#include <conio.h>
void main()
{
struct student
{
int roll;
char name[30];
float marks;
};
   struct student s1,s2,s3;
   printf("Enter the roll of student 1 ");
   scanf("%d",&s1.roll);
   printf("Enter the name of student 1");
   scanf("%s",s1.name);
   printf("Enter the marks of student 1");
   scanf("%f",&s1.marks);
   printf("Enter the roll of student 2 ");
   scanf("%d",&s2.roll);
   printf("Enter the name of student 2");
   scanf("%s",s2.name);
   printf("Enter the marks of student 2");
   scanf("%f",&s2.marks);
   printf("Enter the roll of student 3 ");
   scanf("%d",&s3.roll);
   printf("Enter the name of student 3");
   scanf("%s",s3.name);
   printf("Enter the marks of student 3");
   scanf("%f",&s3.marks);
```

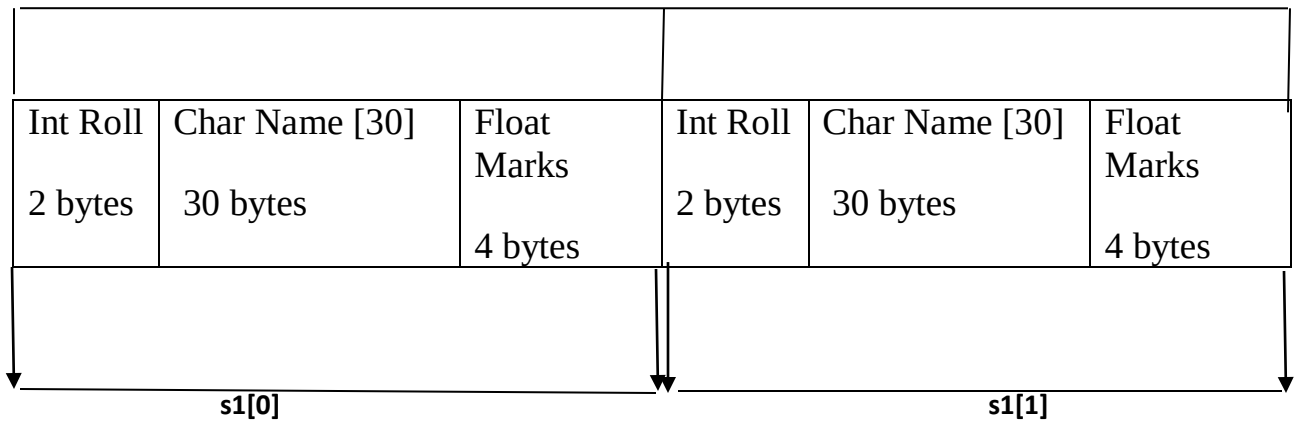
```
    printf("Printing the details....\n");
    printf("%d %s %f\n",s1.roll,s1.name,s1.marks);
    printf("%d %s %f\n",s2.roll,s2.name,s2.marks);
    printf("%d %s %f\n",s3.roll,s3.name,s3.marks);
    getch();
}
```

In the above program, we have stored data of three students in three different structure variables namely s1, s2and s3. However, the complexity of the program will increase, if there are 20 students. In that case, we will have to declare 20 different structure variables and store them one by one. This will always be tough since we will have to declare a variable every time we add a student. To overcome this problem, we can use the concept of array of structures.

An array of structures in **C** can be defined as the collection of multiple structures variables where each variable contains information about different entities. The array of structures in C are used to store information about multiple entities of different data types. The array of structures is also known as the collection of structures. So basically we can assume that it is an array, where each element of that array is a structure.

Let us see the following figure:-
This figure shows the declaration of an array of structure having two elements.

struct student s1[2]



To do this we first declare the structure type as follows:-

```
struct student
{
int roll;
char name[30];
float marks;
};
```

Then we declare an array of two elements where the elements are of structure type student. It is done as follows:

```
struct student s1[2];
```

First element of this array of structure will be denoted by s1[0], the second element by s1[1] .

EXAMPLE : A C program to store five records of students in an array of structures and display them.

```
#include <stdio.h>
#include <conio.h>
void main()
{
struct student
{
   int roll;
   char name[30];
   float marks;
  };
struct student s1[5];
int i;
/* Taking input values from the user in the structure members */ comment
 for( i=0; i<5; i++ )
  {
        printf("Enter  Roll:");
        scanf(”%d”, &s1[i].roll);
        printf("Enter  Name:");
        scanf(“%s”, s1[i].name);
        printf("Enter  marks:");
        scanf(“%f”, &s1[i].marks);
  }
```

```
 /* Displaying the values of structure members */ comment
  for( i=0; i<5; i++ )
  {
        printf("Student Roll: %d", s1[i].roll);
        printf("\nStudent Name : %s", s1[i].name);
        printf("\nStudent marks: %f", s1[i].marks);
   }
getch();
}
```