NIIT STRUCTURE IN C

Structure in C

Structure in c language is *a user defined datatype* that allows you to hold different type of elements.

Each element of a structure is called a member.

It works like a template in C++ and class in Java. You can have different type of elements in it.

It is widely used to store student information, employee information, product information, book information etc.

Defining structure

The **struct** keyword is used to define structure. Let's see the syntax to define structure in c.

```
struct structure_name
{
   data_type member1;
   data_type member2;
   .
   .
   data_type memeberN;
};
```

Let's see the example to define structure for employee in c.

```
struct employee
{   int id;
   char name[50];
   float salary;
};
```

Here, **struct** is the keyword, **employee** is the tag name of structure; **id**, **name** and **salary** are the members or fields of the structure. Let's understand it by the diagram given below:

Declaring structure variable

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We can declare variable for the structure, so that we can access the member of structure easily. There are two ways to declare structure variable:

1. By struct keyword within main() function
2. By declaring variable at the time of defining structure.

1st way:

Let's see the example to declare structure variable by struct keyword. It should be declared within the main function.

```
struct employee
{   int id;
    char name[50];
    float salary;
};
```

Now write given code inside the main() function.

```
struct employee e1, e2;
```

2nd way:

Let's see another way to declare variable at the time of defining structure.

```
struct employee
{   int id;
    char name[50];
    float salary;
}e1,e2;
```

Which approach is good

But if no. of variable are not fixed, use 1st approach. It provides you flexibility to declare the structure variable many times.

If no. of variables are fixed, use 2nd approach. It saves your code to declare variable in main() fuction.

Accessing members of structure

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There are two ways to access structure members:

1. By . (member or dot operator)
2. By -> (structure pointer operator)

Let's see the code to access the *id* member of *p1* variable by . (member) operator.

```
p1.id
```

C Structure example

Let's see a simple example of structure in C language.

```
#include<stdio.h>
#include <string.h>
struct employee
{   int id;
    char name[50];
}e1;  //declaring e1 variable for structure
int main( )
{
  //store first employee information
  e1.id=101;
  strcpy(e1.name, "Sonoo Jaiswal");//copying string into char array
  //printing first employee information
  printf( "employee 1 id : %d\n", e1.id);
  printf( "employee 1 name : %s\n", e1.name);
return 0;
}
```

Output:

```
employee 1 id : 101
employee 1 name : Sonoo Jaiswal
```

Let's see another example of structure in C language to store many employees information.

```
#include<stdio.h>
#include <string.h>
```

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```c
struct employee
{   int id;
    char name[50];
    float salary;
}e1,e2;  //declaring e1 and e2 variables for structure
int main( )
{
   //store first employee information
   e1.id=101;
   strcpy(e1.name, "Sonoo Jaiswal");//copying string into char array
   e1.salary=56000;

  //store second employee information
   e2.id=102;
   strcpy(e2.name, "James Bond");
   e2.salary=126000;

   //printing first employee information
   printf( "employee 1 id : %d\n", e1.id);
   printf( "employee 1 name : %s\n", e1.name);
   printf( "employee 1 salary : %f\n", e1.salary);

   //printing second employee information
   printf( "employee 2 id : %d\n", e2.id);
   printf( "employee 2 name : %s\n", e2.name);
   printf( "employee 2 salary : %f\n", e2.salary);
   return 0;
}
```

Output:

```
employee 1 id : 101
employee 1 name : Sonoo Jaiswal
employee 1 salary : 56000.000000
employee 2 id : 102
employee 2 name : James Bond
employee 2 salary : 126000.000000
```

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Array of Structures in C

There can be array of structures in C programming to store many information of different data types. The array of structures is also known as collection of structures.

Let's see an example of structure with array that stores information of 5 students and prints it.

```
#include<stdio.h>
#include <string.h>
struct student{
int rollno;
char name[10];
};
int main(){
int i;
struct student st[5];
printf("Enter Records of 5 students");
for(i=0;i<5;i++){
printf("\nEnter Rollno:");
scanf("%d",&st[i].rollno);
printf("\nEnter Name:");
scanf("%s",&st[i].name);
}
printf("\nStudent Information List:");
for(i=0;i<5;i++){
printf("\nRollno:%d, Name:%s",st[i].rollno,st[i].name);
}
   return 0;
}
```

Output:

```
Enter Records of 5 students
Enter Rollno:1
Enter Name:Sonoo
Enter Rollno:2
Enter Name:Ratan
```

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```
Enter Rollno:3
Enter Name:Vimal
Enter Rollno:4
Enter Name:James
Enter Rollno:5
Enter Name:Sarfraz

Student Information List:
Rollno:1, Name:Sonoo
Rollno:2, Name:Ratan
Rollno:3, Name:Vimal
Rollno:4, Name:James
Rollno:5, Name:Sarfraz
```