C Programming
Class- BCA IInd Semester

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Outline

unit 4: Structure

- Structure

- Declaring Structure Variables

- Accessing Structure Members

- Assigning Values to the Members

- Structure Initialization

- Use of Structures

Structure

➢ Structure is a user-defined data type. It allows us to combine the different data types under a single name for better handling. Structure represent a record such as student record which contain name of student, city of student, roll number   age and date of birth. Keyword struct is use to define a structure. The syntax of a struct is as following-

struct structure_name

{

 Statements

};

Example of Structure:

struct Student

{

 char[20] name;

 int rollno;

 int age;

};

Declaring Structure Variables

➢ Members of the structure cannot be accessed directly. To access the member of a structure within a program, a variable has to be declared. The following format is used.

struct book

{

char title[20];

char author[15];

float price;

};

struct book book1, book2, book3;

➢ The other way to declare a structure variable is to combine both the structure definition and variables declaration in one statement.

struct book

{

char title[20];

char author[15];

float price;

} book1, book2, book3;

Accessing Structure Members

The individual members of a structure can be accessed through the structure variable only. The link between a member and a variable is established through the operator '.' is called as the dot operator or member operator or period operator. The syntax is

Structure variable. member name

For example,

struct book

{

char title[20];

char author[15];

float price;

} book1, book2, book3;

book1.price;
book2.author;
book1.title;

Assigning Values to the Members

Members of the structure can be assigned the values as given below.

strcpy(book1.title, " Java Programming");

book1. author = "raj";

book1.price = 275.00;

scanf can also be used to give values through the keyboard.

scanf("%s", book1.title);

scanf("%s", book1.author);

scanf("%f", &book1. price);

Structure Initialization

Like any other data type, a structure variable can be initialized at compile time. The general format for structure initialization is

struct time

{

int hrs;

int mins;

int secs;

}t1,t2;

struct time t1 = {4, 52, 29};

struct time t2 = {10, 40, 21};

```c
main()
{
struct student
{
int roll_no;
char name[10];
int age;
}s;
printf("Enter roll, name and age: ");
scanf("%d %s %d", &s.roll_no, s.name, &s.age);
printf("\nEntered information: \n");
printf("Roll number: %d", s.roll_no);
printf("\nName: %s", s.name);
printf("\nAge: %d",s.age);
}
```

```c
int main (void)
{
struct date
{
int month;
int day;
int year;
};
struct date today;
today.month = 4;
today.day = 25;
today.year = 2009;
printf ("Today's date is %i / %i / %.2i.\n", today.month, today.day,
today.year % 100);
return 0;
}
```

Uses of Structures

Where are structures useful? The immediate application that comes to the mind is Database Management. That is, to maintain data about employees in an organization, books in a library, items in a store, financial accounting transactions in a company etc. They can be used for a variety of purposes like:

1. Changing the size of the cursor
2. Clearing the contents of the screen
3. Placing the cursor at an appropriate position on screen
4. Drawing any graphics shape on the screen
5. Receiving a key from the keyboard
6. Checking the memory size of the computer
7. Finding out the list of equipment attached to the computer
8. Formatting a floppy
9. Hiding a file from the directory
10. Displaying the directory of a disk
11. Sending the output to printer
12. Interacting with the mouse

Exercise

1. Develop a program in c using structures to read the following information from the keyboard.

   employee name
   employee code
   designation
   age

1. Write a program to assign some values to structure members. Display it on the screen using the structure tag.

2. Create a structure to specify data of customers in a bank. The data to be stored is: Account number, Name, Balance in account. Assume maximum of 200 customers in the bank.

3. Write a program to retrieve information on parts with serial numbers between BB1 and CC6.

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Thanks