Assignment No.: 15

Course Name	Programming in C Lab
Name of Student	Faheemuddin Sayyed
PRN No.	23070122196
Branch	CSE
Class	C-1
Academic Year & Semester	2023-2024 & Semester 2
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Assignment Title (Full):	Write a C Program to demonstrate Structure pointer.

Theory: (Note: According to the assignment title, please write the background information as an introduction, then write the steps/logic/process/algorithm of the C program in the Journal Notebook, and add its screenshot in the below theory response.)

Theory Response:

- Define two structures: Date for date components and Book containing book details and dates.
- Implement Fine function to calculate overdue fine based on return and issue dates.
- Implement Insert function to input book details and issue/return dates, then calculate fine using Fine function.
- Implement Display function to print book details and fine.
- In main, initialize books (b1, b2, b3) with predefined values and calculate fine using Fine.
- Use Insert to input details for b4, calculate fine, and display all book details.

Output: (Note: Execute the C program as per the assignment title, take an input code and output result screenshot with the date and time from your computer, and add its screenshot in the below output response.)

Output Response:

```c
1    #include <stdio.h>
2
3    struct Date {
4        int dd;
5        int mm;
6        int yy;
7    };
8
9    struct Book {
10       char name[100];
11       char auth_name[100];
12       struct Date issue;
13       struct Date rtrn;
14       float fine;
15   };
16
17   // Assuming return date to be 1 month after issue date
18   void Fine(struct Book *b) {
19       int days=0;
20       b->fine = 0;
21       if(b->rtrn.mm-b->issue.mm>1){
22           if(b->rtrn.dd>b->issue.dd){
23               days=(b->rtrn.mm-b->issue.mm-1)*30+b->rtrn.dd-b->issue.dd;
24           }
25           else{
26               days=(b->rtrn.mm-b->issue.mm-2)*30+(30-b->issue.dd+b->rtrn.dd);
27           }
28       }
29       else if(b->rtrn.mm-b->issue.mm==1){
30           if(b->rtrn.dd>b->issue.dd){
31               days=b->rtrn.dd-b->issue.dd;
32           }
33           else return;
34       }
35       else return;
36       b->fine=days*5; // 5rs per day fine
37   }
38
39   void Insert(struct Book *b){
40       printf("\nPlease enter Book name: ");
41       scanf("%[^\n]s",b->name);
42       getchar(); // Consuming newline character
43       printf("\nPlease enter Author name: ");
44       scanf("%[^\n]s",b->auth_name);
45       getchar();
46       printf("\nPlease enter Issuing date (dd mm yy): ");
47       scanf("%d %d %d",&b->issue.dd,&b->issue.mm,&b->issue.yy);
48       printf("\nPlease enter Return date (dd mm yy): ");
49       scanf("%d %d %d",&b->rtrn.dd,&b->rtrn.mm,&b->rtrn.yy);
50       Fine(b);
51   }
52
53   void Display(struct Book b){
54       printf("\nBook Name: %s", b.name);
55       printf("\nAuthor Name: %s", b.auth_name);
56       printf("\nIssuing Date: %d/%d/%d", b.issue.dd, b.issue.mm, b.issue.yy);
57       printf("\nReturn Date: %d/%d/%d", b.rtrn.dd, b.rtrn.mm, b.rtrn.yy);
58       printf("\nFine: \u20B9%.2f\n", b.fine);
59   }
60
61   int main() {
62       struct Book b1={"The Great Gatsby","F. Scott Fitzgerald",{1,1,22},{15,1,22},0};
63       struct Book b2={"To Kill a Mockingbird","Harper Lee",{10,2,22},{25,3,22},0};
64       struct Book b3={"1984","George Orwell",{20,3,22},{10,5,22},0};
65       struct Book b4;
66
67       Fine(&b1);
68       Fine(&b2);
69       Fine(&b3);
70
71       Display(b1);
72       Display(b2);
73       Display(b3);
74
75       Insert(&b4);
76       Display(b4);
77       printf("\n");
78       return 0;
79   }
```

```
Book Name: The Great Gatsby
Author Name: F. Scott Fitzgerald
Issuing Date: 1/1/22
Return Date: 15/1/22
Fine: ₹0.00

Book Name: To Kill a Mockingbird
Author Name: Harper Lee
Issuing Date: 10/2/22
Return Date: 25/3/22
Fine: ₹75.00

Book Name: 1984
Author Name: George Orwell
Issuing Date: 20/3/22
Return Date: 10/5/22
Fine: ₹100.00

Please enter Book name: Don Quixote

Please enter Author name: Miguel de Cervantes

Please enter Issuing date (dd mm yy): 12 04 24

Please enter Return date (dd mm yy): 15 05 24

Book Name: Don Quixote
Author Name: Miguel de Cervantes
Issuing Date: 12/4/24
Return Date: 15/5/24
Fine: ₹15.00

○ (base) fahee@Faheems-MacBook-Pro Programming_in_C %
```

Conclusion: (Note: Write the key findings or outcome from this assignment, enlist their potential real-world applications in Journal Notebook, and add its screenshot in the below conclusion response.)

Conclusion Response:

This program uses structure pointers to manage book records. It demonstrates functions to calculate fines based on issue and return dates, alongside functions to input and display book details. By organizing data into structures and using pointers, the program efficiently handles book records and associated operations.

Please note that assignment content can be readable.

Faculty Name:
        Dr. Kanhaiya Sharma
        Prof. Mahesh Arse
        Prof. Sachin R. Gaikwad
        Prof. Surabhi Thatte