

## **LAB ASSIGNMENT -4**

Store student records (fields: rollno,Name,branch,age) in a data file and build an index file by using binary search tree ( *rollno* is used as the key).

**i.Perform search in the index file by reading *rollno* as input and then display the student details by reading from the data file and display the time required to do this operation.**

**ii.Add and delete the student records from the data file and then perform corresponding modifications in the index file.**

### **CODE:**

```
#include <stdio.h>
#include <string.h>
#include <conio.h>
#include <time.h>
typedef struct Student
{
    char name[50];
    char rollNo[15];
    char branch[10];
    float age;
}Student;

void createAccount();
void displayInfo();
void deleteInfo();
void searchInfo();

int main()
{
    clock_t t;
    char option;
```

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```

while (option != '0')
{
    system("cls");
    printf("\t\t===== Student Management Database System =====\n");
    printf("\n\t\t1. Add Student Account");
    printf("\n\t\t2. Display All Students Information");
    printf("\n\t\t3. Delete Student Information");
    printf("\n\t\t4. Search Student Information");
    printf("\n\t\t0. Exit");

    printf("\n\n\n\t\tEnter Your Option: ");
    scanf("%c", &option);

    switch (option)
    {
        case '1':
            createAccount();
            break;
        case '2':
            displayInfo();
            break;
        case '3':
            deleteInfo();
            break;
        case '4':
            t = clock();
            searchInfo();
            t = clock() - t;
            double time_taken = ((double)t)/CLOCKS_PER_SEC; // in seconds

```

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```

printf("\n\n\t\t%-20s%-13s%-10s%-15s\n", "Name", "ID", "Dept.", "AGE");
printf("\t\t-----");

while (fread(&stuInfo, sizeof(stuInfo), 1, fileOne) == 1)
{
    printf("\n\n\t\t%-20s%-13s%-10s%-.2f", stuInfo.name, stuInfo.rollNo, stuInfo.branch,
stuInfo.age);
}

printf("\n\n\t\tEnter any keys to continue.....");
getch();

fclose(fileOne);
}

void updateInfo()
{
    FILE *fileOne = fopen("studInfoFile.bin", "rb");
    FILE *temp = fopen("temp.bin", "wb");

    Student studentInformation, tempInformation;

    int choice, flag = 0;

    if (fileOne == NULL || temp == NULL)
    {
        printf("\n\n\t\tError !\n");
    }

    system("cls");

```

```

printf("\t\t\t\t==== Update Students Information =====\n");

printf("\n\t\t\t\tEnter Student's ID : ");
getchar();
gets(tempInformation.rollNo);

while (fread(&studentInformation, sizeof(studentInformation), 1, fileOne) == 1)
{
    if (strcmp(studentInformation.rollNo, tempInformation.rollNo) == 0)
    {
        flag++;

        printf("\n\t\t\t\tChoose your option :\n\t\t\t\t1.Update Student Name\n\t\t\t\t2.Update Student
Dept.\n\t\t\t\t3.Update Student AGE");

        printf("\n\n\t\t\t\tEnter Your Option : ");
        scanf("%d", &choice);
        if (choice == 1)
        {
            printf("\n\t\t\t\tEnter Student's Name to Update: ");
            getchar();
            gets(tempInformation.name);
            strcpy(studentInformation.name, tempInformation.name);

            fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
            printf("\n\n\t\t\t\tUpdated successfully!\n\n");
        }
        else if (choice == 2)
        {
            printf("\n\t\t\t\tEnter Student's Dept. to Update: ");
            getchar();

```

```

        gets(tempInformation.branch);
        strcpy(studentInformation.branch, tempInformation.branch);

        fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
        printf("\n\n\t\tUpdated successfully!\n\n");
    }
    else if (choice == 3)
    {
        printf("\n\t\tEnter Student's AGE to Update: ");
        scanf("%f", &tempInformation.age);
        studentInformation.age = tempInformation.age;

        fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
        printf("\n\n\t\tUpdated successfully!\n\n");
    }
    else
    {
        printf("\n\t\tInvalid Option.");
        fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
    }
}
else
{
    fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
}
}

fclose(fileOne);
fclose(temp);

```

```

remove("studInfoFile.bin");
rename("temp.bin", "studInfoFile.bin");

if (flag == 0)
{
    printf("\n\t\tStudent Id is not found");
}

printf("\n\n\t\tEnter any keys to continue.....");
getch();
}

void deleteInfo()
{
    FILE *fileOne = fopen("studInfoFile.bin", "rb");
    FILE *temp = fopen("temp.bin", "wb");

    Student studentInformation, tempInformation;

    int choice, flag = 0;

    if (fileOne == NULL || temp == NULL)
    {
        printf("\n\t\tError !\n");
    }

    system("cls");

    printf("\t\t\t==== Delete Student Information =====\n");

```



```

printf("\n\t\t\tEnter Student's ID : ");
getchar();
gets(tempInformation.rollNo);

while (fread(&studentInformation, sizeof(studentInformation), 1, fileOne) == 1)
{
    if (strcmp(studentInformation.rollNo, tempInformation.rollNo) == 0)
    {
        flag++;

        printf("\n\t\t\tAre you sure to delete ??\n\t\t\t\t1.Yes\n\t\t\t\t2.Back\n\t\t\t\tEnter Your
Option : ");

        scanf("%d", &choice);

        if (choice == 1)
        {
            printf("\n\n\t\t\tInformation has been deleted successfully!\n\n");
        }

        else if (choice == 2)
        {
            fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
        }

        else
        {
            printf("\n\t\t\tInvalid Option");

            fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
        }
    }

    else
    {
        fwrite(&studentInformation, sizeof(studentInformation), 1, temp);
    }
}

```

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```

    }

fclose(fileOne);
fclose(temp);

remove("studInfoFile.bin");
rename("temp.bin", "studInfoFile.bin");

if (flag == 0)
{
    printf("\n\t\tStudent Id is not found");
}

printf("\n\n\t\tEnter any keys to continue.....");
getch();
}

void searchInfo()
{
    FILE *fileOne = fopen("studInfoFile.bin", "rb");

    Student studentInformation;

    int choice, flag = 0;
    char rollNo[20], branch[10];

    if (fileOne == NULL)
    {
        printf("\n\t\tError !\n");
    }

```

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```

system("cls");
printf("\t\t\t\t\t==== Search Student Information =====\n");
printf("\n\n\t\t\tEnter Student ID : ");
getchar();
gets(rollNo);
while (fread(&studentInformation, sizeof(studentInformation), 1, fileOne) == 1)
{
    if (strcmp(studentInformation.rollNo, rollNo) == 0)
    {
        flag++;

        printf("\n\t\t\tStudent Name : %s\n\t\t\tStudent ID : %s\n\t\t\tStudent Dept. : 
%s\n\t\t\tStudent AGE : %.2f\n", studentInformation.name, studentInformation.rollNo,
studentInformation.branch, studentInformation.age);


    }
}

if (flag == 0)
{
    printf("\n\t\t\tStudent Id is not found");
}

fclose(fileOne);

}

```


 "D:\DBMS\dbms lab3.exe"

===== Create Student Account =====

Enter Student's Name : abc  
Enter Student's ID : 150  
Enter Student's Department : cse  
Enter Student's Current age : 19

Informations have been stored sucessfully

Enter any keys to continue.....


 "D:\DBMS\dbms lab3.exe"

===== Create Student Account =====

Enter Student's Name : def  
Enter Student's ID : 174  
Enter Student's Department : cse  
Enter Student's Current age : 19

Informations have been stored sucessfully

Enter any keys to continue.....

 "D:\DBMS\dbms lab3.exe"

===== All Students Information =====

Name	ID	Dept.	AGE
abc	150	cse	19.00
def	174	cse	19.00

Enter any keys to continue.....

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```
===== Search Student Information =====
```

```
Enter Student ID : 174
```

```
Student Name : def
```

```
Student ID : 174
```

```
Student Dept. : cse
```

```
Student AGE : 19.00
```

```
searchInfo() operation took 2.195000 seconds to execute
```

```
Enter any keys to continue.....
```

```
===== Delete Student Information =====
```

```
Enter Student's ID : 150
```

```
Are you sure to delete ??
```

```
1.Yes
```

```
2.Back
```

```
Enter Your Option : 1
```

```
Information has been deleted successfully!
```

```
Enter any keys to continue.....■
```

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