

DBMS LAB ASSIGNMENT 4

1.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.

A. 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();
```

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```

void deleteInfo();
void searchInfo();

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

        printf("\n\n\n\t\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
                printf("\n\n\t\t\tsearchInfo() operation took %f seconds to execute \n",
time_taken);
                printf("\n\n\n\t\t\tEnter any keys to continue.....");
                getch();
        }
    }
}

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        break;
    case '0':
        printf("\n\t\t\t==== Thank You =====");
        break;
    default:
        printf("\n\t\t\tInvalid Option, Please Enter Right Option !\n");
    }
}
return 0;
}

```

```

void createAccount()
{
    FILE *fileOne = fopen("studInfoFile.txt", "ab+");

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

    Student stuInfo;

    system("cls");

    printf("\t\t\t==== Create Student Account =====\n");

    printf("\n\t\t\tEnter Student's Name : ");
    getchar();
    gets(stuInfo.name);
    printf("\t\t\tEnter Student's ID : ");
    gets(stuInfo.rollNo);
    printf("\t\t\tEnter Student's Department : ");
    gets(stuInfo.branch);
    printf("\t\t\tEnter Student's Current age : ");
    scanf("%f", &stuInfo.age);
    fwrite(&stuInfo, sizeof(stuInfo), 1, fileOne);
    printf("\n\n\t\t\tInformations have been stored sucessfully\n");
    printf("\n\n\t\t\tEnter any keys to continue.....");
    getch();
    fclose(fileOne);
}

```

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```

}

void displayInfo()
{
    FILE *fileOne = fopen("studInfoFile.txt", "rb");

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

    Student stuInfo;

    system("cls");

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

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

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

    fclose(fileOne);
}

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

    Student studentInformation, tempInformation;

    int choice, flag = 0;

```

```

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

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        printf("\n\n\t\t\tUpdated successfully!\n\n");
    }
    else if (choice == 3)
    {
        printf("\n\t\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\t\tUpdated successfully!\n\n");
    }
    else
    {
        printf("\n\t\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\t\tStudent Id is not found");
}

printf("\n\n\t\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\t\tError !\n");
}

system("cls");

printf("\t\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);

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```

        }
    }
    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\t\tStudent Id is not found");
}

printf("\n\n\t\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\t\tError !\n");
    }

    system("cls");
    printf("\t\t\t\t===== Search Student Information =====\n");
    printf("\n\n\t\t\tEnter Student ID : ");

```

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```

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);
}

```

OUTPUT:

```

===== Student Management Database System =====

1. Add Student Account
2. Display All Students Information
3. Delete Student Information
4. Search Student Information
0. Exit

Enter Your Option: 1_

```

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

```
Enter Student's Name : Lohith  
Enter Student's ID : 161  
Enter Student's Department : CSE  
Enter Student's Current age : 19
```

```
Informations have been stored sucessfully
```

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

```
===== Student Management Database System =====
```

1. Add Student Account
2. Display All Students Information
3. Delete Student Information
4. Search Student Information
0. Exit

```
Enter Your Option: 1_
```

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

```
Enter Student's Name : Surya  
Enter Student's ID : 876  
Enter Student's Department : CSE  
Enter Student's Current age : 19
```

```
Informations have been stored sucessfully
```

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

```
===== Student Management Database System =====
```

1. Add Student Account
2. Display All Students Information
3. Delete Student Information
4. Search Student Information
0. Exit

Enter Your Option: 1_

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

Enter Student's Name : Singh

Enter Student's ID : 761

Enter Student's Department : CSE

Enter Student's Current age : 19

Informations have been stored sucessfully

Enter any keys to continue....._

```
===== Student Management Database System =====
```

1. Add Student Account
2. Display All Students Information
3. Delete Student Information
4. Search Student Information
0. Exit

Enter Your Option: 2

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

Name	ID	Dept.	AGE

Lohith	161	CSE	19.00
Ravi	876	CSE	19.00
Surya	906	CSE	19.00

Enter any keys to continue.....

===== Student Management Database System =====

1. Add Student Account
2. Display All Students Information
3. Delete Student Information
4. Search Student Information
0. Exit

Enter Your Option: 3

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

Enter Student's ID : 161

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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```
===== Student Management Database System =====
```

1. Add Student Account
2. Display All Students Information
3. Delete Student Information
4. Search Student Information
0. Exit

```
Enter Your Option: 4
```

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

```
Enter Student ID : 161
```

```
Student Id is not found
```

```
searchInfo() operation took 4.958000 seconds to execute
```

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