

PROGRAM TITLE:Create and maintain a student database using concept of File Handling. Store Roll, Name, Subject and Marks for each student.

PROGRAM ALGORITHM:

```
insert()
{
    open the file in append mode, so that the put pointer points to the end of
the file;
    read the inputs from the user and write into the file.
}
search()
{
    take user input of the roll by which we want to search;
    point mystream to the beginning of the database;
    create a new file named 'temp' and point tempstream to its beginning;
    search for the roll no in the list of records, if not found, write the
records into the temp file;
    if found, ask the user if he wants to delete the record or modify it. If
he wants to delete the record then simply don't write the record onto the temp
file, otherwise write the modified records into the temp file;
    now delete the original database;
    rename the 'temp' file as database;
}
```

PROGRAM CODE:

```
#include <iostream>
#include <fstream>
using namespace std;

class Student
{
    int roll;
    char name[50];
    char sub[50];
    int marks;
public:
    friend void insert();
    friend void search();
};

void insert()
{
    Student a;
    ofstream out("database",ios::out|ios::app);
    if(!out)
    {
        cout<<"\n\tCannot open file\n";
        return;
    }
    cout<<"\n\tEnter Details::";
    cout<<"\n\tRoll:";
    cin>>a.roll;
```

```

    cin.ignore(1); //discards the '\n' character from the input stream
    cout<<"\tName:";
    cin.getline(a.name,50); //used to get both the name and surname
    cout<<"\tSubject:";
    cin>>a.sub;
    cout<<"\tMarks:";
    cin>>a.marks;
    out<<a.roll<<" "<<a.name<<"|"<<a.sub<<" "<<a.marks<<endl;
    out.close();
    return;
}

void search()
{
    Student a;
    int search,flag=0;
    char t[100];
    cout<<"\n\tEnter the roll which you want to search:";
    cin>>search;
    ifstream mystream("database",ios::in);
    ofstream tempstream("temp",ios::out);
    if(!mystream)
    {
        cout<<"\n\tCannot open file.\n";
        return;
    }
    while(!mystream.eof())
    {
        mystream>>a.roll;
        if(mystream.eof())
            break;
        if(search!=a.roll)
        {
            mystream.getline(t,100);
            tempstream<<a.roll<<t<<endl;
        }
        else
        {
            flag=1;
            char ch;
            int x;
            mystream.getline(a.name,50,'|');
            mystream>>a.sub;
            mystream>>a.marks;
            cout<<"\n\tThe contents are:\n";
            cout<<"\n\tRoll:"<<a.roll;
            cout<<"\n\tName:"<<a.name;
            cout<<"\n\tSubject:"<<a.sub;
            cout<<"\n\tMarks:"<<a.marks;
            cout<<"\n\tDo you want to 1.Delete or 2.Update ::";
            cin>>x;
            switch(x)
            {
                case 1: break;
                case 2: cout<<"\n\tEnter updates::";
                        cout<<"\n\tDo you want to change the Roll?(y/n):";
                        cin>>ch;
                        if(ch=='y')

```

```

        {
            cout<<"\tRoll:";
            cin>>a.roll;
        }
        cout<<"\tDo you want to change the Name?(y/n):";
        cin>>ch;
        if(ch=='y')
        {
            cin.ignore(1);//discards the '\n' character
from the input stream

            cout<<"\tName:";
            cin.getline(a.name,50);//used to get both the
name and surname

        }
        cout<<"\tDo you want to change the Subject?(y/n):";
        cin>>ch;
        if(ch=='y')
        {
            cout<<"\tSubject:";
            cin>>a.sub;
        }
        cout<<"\tDo you want to change the Marks?(y/n):";
        cin>>ch;
        if(ch=='y')
        {
            cout<<"\tMarks:";
            cin>>a.marks;
        }
        tempstream<<a.roll<<" "<<a.name<<"|"<<a.sub<<"
"<<a.marks<<endl;

        break;
        default:cout<<"\n\tInvalid Choice.";
        tempstream<<a.roll<<" "<<a.name<<"|"<<a.sub<<"
"<<a.marks<<endl;

        break;
    }
}

if(flag==0)
{
    cout<<"\n\tThe Record is not found.\n";
}
mystream.close();
tempstream.close();
remove("database");
rename("temp", "database");
remove("temp");
return;
}

void display()
{
    char ch;
    ifstream in("database",ios::in);
    if(!in)
    {
        cout<<"\n\tCannot open file.\n";
        return;
    }
}

```

```

    }
    cout<<"\n\tThe File is::\n";
    while(in.get(ch))
        cout<<ch;
    in.close();
    return;
}
int main()
{
    int ch=1;
    while(ch!=0)
    {
        cout<<"\n\tMenu::\n\t1.Insert a new record\n\t2.Modify a
record\n\t3.Display the contents of the file\n\t0.Exit\n\tEnter Choice::";
        cin>>ch;
        switch(ch)
        {
            case 1: insert();
                    break;
            case 2: search();
                    break;
            case 3:  display();
                    break;
            case 0: cout<<"\tProgram Terminated.\n";
                    break;
            default: cout<<"\n\tWrong Choice.\n";
        }
    }
    return 0;
}

```

OUTPUT:

```

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::1

Enter Details::
Roll:229
Name:Iron Man
Subject:Physics
Marks:88

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::1

Enter Details::
Roll:230
Name:Hulk

```

Subject:Drawing
Marks:87

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::3

The File is::
229 Iron Man|Physics 88
230 Hulk|Drawing 87

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::1

Enter Details::
Roll:222
Name:Black Widow
Subject:Music
Marks:75

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::1

Enter Details::
Roll:209
Name:Thor
Subject:Science
Marks:59

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::1

Enter Details::
Roll:153
Name:Captain America
Subject:SST
Marks:99

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file

0.Exit
Enter Choice::3

The File is::
229 Iron Man|Physics 88
230 Hulk|Drawing 87
222 Black Widow|Music 75
209 Thor|Science 59
153 Captain America|SST 99

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::2

Enter the roll which you want to search:153

The contents are:

Roll:153
Name:Captain America
Subject:SST
Marks:99
Do you want to 1.Delete or 2.Update ::2

Enter updates::
Do you want to change the Roll?(y/n):y
Roll:110
Do you want to change the Name?(y/n):n
Do you want to change the Subject?(y/n):y
Subject:Philosophy
Do you want to change the Marks?(y/n):y
Marks:87

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::3

The File is::
229 Iron Man|Physics 88
230 Hulk|Drawing 87
222 Black Widow|Music 75
209 Thor|Science 59
110 Captain America|Philosophy 87

Menu::
1.Insert a new record
2.Modify a record
3.Display the contents of the file
0.Exit
Enter Choice::2

Enter the roll which you want to search:222

The contents are:

Roll:222

Name: Black Widow

Subject:Music

Marks:75

Do you want to 1.Delete or 2.Update ::1

Menu::

1.Insert a new record

2.Modify a record

3.Display the contents of the file

0.Exit

Enter Choice::3

The File is::

229 Iron Man|Physics 88

230 Hulk|Drawing 87

209 Thor|Science 59

110 Captain America|Philosophy 87

Menu::

1.Insert a new record

2.Modify a record

3.Display the contents of the file

0.Exit

Enter Choice::0

Program Terminated.

DISCUSSION:

1.The complexity of delete is $O(1)$.

2.The complexity of update is $O(1)$.

3.The display function cannot create a new file, it is only there to read from an existing file.

4.Care should be taken to close the file before exiting the function. Otherwise the file will be inaccessible later on.

5.The Program deals only with .txt files.