Lab 10: I/O stream in C++

Lab:

Question: 1

WAP in C++ that shows the unformatted I/O using getline() and write().

getline: It reads the single line or multiline text that ends with newline or specified delimeter or until maximum limit is met.

write(): It is used to the display number of characters specified by the user even beyond the size of the string to be displyed(even beyond '\0')

```
#include<iostream>
#include<string.h>
#define Max 40
using namespace std;
int main( )
{
      char str[Max];
      cout<<"Enter a sentence:"<<endl;
      cin.getline(str,Max);
    cout<<"The entered sentence is:";
      for(int i=0;i<=strlen(str);i++)
      {
            cout.write(str,i);
            cout<<endl;
      }
return 0;
}
```

Output:

Question: 2

Write a simple C++ program to write to a file.

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

int main() {
    ofstream fout("example.txt");
```

```
    fout << "Hello, File Handling in C++!" << endl;
    fout.close();
    return 0;
}
```

Output:

Question: 3

Write a simple C++ program to read data from a file.

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

int main() {
    ifstream fin("example.txt");
    string line;
    while (getline(fin, line)) {
        cout << line << endl;
    }
    fin.close();
    return 0;
}
```

Output:

Question: 4

WAP to write to a file with *fout* and then reading it back with *fin.*

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

int main() {
    fstream fout, fin;


    fout.open("ambition.txt", ios::out);
    if (!fout) {
        cout << "Error opening file for writing!" << endl;
        return 1;
    }

    fout << "Hello, this is a test file." << endl;
    fout << "I am learning C++ file handling." << endl;

    fout.close();

    fin.open("ambition.txt", ios::in);
    if (!fin) {
```

```
        cout << "Error opening file for reading!" << endl;
        return 1;
    }

    string line;
    cout << "Contents of file:\n";
    while (getline(fin, line)) {
        cout << line << endl;
    }

    fin.close();

    return 0;
}
```

Question: 5

Write a class student with roll, name, address, marks as member variables and member functions to read and display the information of the students. Write records of 10 students in a binary file and also read the records of the student from the binary file. Also search for a specific record of the student using roll number as a key from the user input.

Theory:

fstream → general file stream (both input & output)

```
fout.open("Student", ios::out | ios::app | ios::binary);
```

- "Student" → filename (no extension is okay, but usually .dat or .bin is used for binary files).
- ios::out → open for writing (output).
- ios::app → append mode (new data is added at the end of file).
- ios::binary → binary mode (store raw bytes, not text).

```
fout.write((char*)&s[i], sizeof(s[i]));
```

- fout.write() → writes raw bytes to file.
- (char*)&s[i] → converts address of student object into a char* pointer (needed for binary write).
- sizeof(s[i]) → tells how many bytes to write (entire object).

```
while(fin.read((char*)&s, sizeof(s)))
{
    s.display();
}
```

- fin.read() → reads raw bytes from file.
- (char*)&s → where the data will be stored (address of student object).
- sizeof(s) → how many bytes to read.

```
#include<iostream>
#include<fstream>
using namespace std;
class student
{
      int roll;
      char name[30];
      char address[30];
      float marks;
      public:
      void input()
      {
            cout<<"Enter the name of the student:"<<endl;
            cin>>name;
            cout<<"Enter the roll of the student:"<<endl;
            cin>>roll;
            cout<<"Enter the address of the student:"<<endl;
            cin>>address;
            cout<<"Enter the marks obtained by the student:"<<endl;
            cin>>marks;
      }
      void display()
      {
            cout<<"Name of the student="<<name;
            cout<<"Roll of the student="<<roll<<endl;
            cout<<"Address of the student="<<address<<endl;
            cout<<"Marks of the student="<<marks<<endl;
      }

     int check(int r)
      {
      if(r==roll)
            return 1;
      else
```

```
            return 0;
      }
};

      void write_records()
      {
            int i;
            student s[10];
            fstream fout;
            fout.open("Student",ios::out|ios::app|ios::binary);
            cout<<"Enter the information of 10 student:"<<endl;
            for(i=0;i<2;i++)
            {
                  s[i].input();
                  fout.write((char*)&s[i], sizeof(s[i]));
            }
            fout.close( );
      }

      void read_records()
      {
            student s;
            fstream fin;
            fin.open("Student",ios::in|ios::binary);
            while(fin.read((char*)&s, sizeof(s)))
            {
                  s.display( );
            }
            fin.close( );
      }
      void search_specific_record()
      {
        student s;
        fstream fin;
        int Roll,flag=0;
        cout<<"Enter the roll number of the student to search the record
for:";
        cin>>Roll;
```

```
  fin.open("Student",ios::in|ios::binary);
  while(fin.read((char*)&s,sizeof(s)))
  {
      if(s.check(Roll))
      {
            s.display( );
            flag=1;
            break;
      }
}
      if(flag==0)
      {
            cout<<"Record not found:"<<endl;
      }
fin.close( );
  }

void deleteRecord()
{
      fstream fin,fout;
      student s;
      int roll,flag=0;
      cout<<"Enter the roll number to be deleted:"<<endl;
      cin>>roll;
      fin.open("Student",ios::in|ios::binary);
      fout.open("Temp",ios::out|ios::binary);
while(fin.read((char*)&s, sizeof(s)))
{
      if(s.check(roll))
      {
            flag=1;
      }
      else
      {
            fout.write((char*)&s,sizeof(s));
      }
}
if(flag==0)
```

```
            cout<<"Not found:"<<endl;
      else
            cout<<"Record Deleted:"<<endl;
      fout.close( );
      fin.close( );
      remove("Student");
      rename("Temp","Student");
}

int main()
{
      int choice;
      while(1)
      {
            cout<<"1.Add Records:"<<endl;
            cout<<"2.Display Records:"<<endl;
            cout<<"3.Search the Record:"<<endl;
            cout<<"4.Delete the record:"<<endl;
            cout<<"5.Exit"<<endl;
            cout<<"Enter the choice:"<<endl;
            cin>>choice;
      switch(choice)
      {
      case 1:
            write_records( );
            break;
      case 2:
            read_records( );
            break;
      case 3:
            search_specific_record( );
            break;
      case 4:
            deleteRecord( );
            break;

      case 5:
            exit(0);
```

```
       default:
              cout<<"wrong choice"<<endl;
       }
       }
       return 0;
   }
```

Output:

Question: 6

Write a program that write content of the file to another file and display it in C++

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

int main() {
    ofstream fout;
    fout.open("source.txt", ios::out);
    if (!fout) {
        cout << "Error opening source file!" << endl;
        return 1;
    }

    cout << "Enter some text (end input with # on a new line):" << endl;
    string line;
    while (true) {
        getline(cin, line);
        if (line == "#") break;
        fout << line << endl;
    }
    fout.close();

    ifstream fin("source.txt");
    ofstream fout2("destination.txt");

    if (!fin || !fout2) {
        cout << "Error opening files!" << endl;
        return 1;
    }

    cout << "\nContents copied from source.txt to destination.txt:\n\n";
    while (getline(fin, line)) {
        fout2 << line << endl;
```

```
        cout << line << endl;
    }

    fin.close();
    fout2.close();

    cout << "\nCopy successful!" << endl;
    return 0;
}
```

Output:

Conclusion:

- What did you learn from the lab?