# Third Year B. Tech (EL & CE)

**Semester: V Subject:** Object-Oriented Programming Lab

**Name: Shreerang Mhatre Class: SY**

**Roll No: 52 Batch: A3**

# Experiment No: 06

**Name of the Experiment**: File and exception Handling

**Performed on: 29/11/2023**

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**Problem Statement:**

A School maintains the mark sheets of all standard students in the following format:

PRN

Student Name

Maths

Physics

Chemistry

Total %

Grade

A teacher put marks for the student by his/her PRN and the system checks whether marks

for different subjects are negative or not. If it is negative, the system displays appropriate

message otherwise updates the files by storing the marks across the subjects. The system calculates

the total percentage after putting marks for all three subjects and accordingly finds the grade.

Whenever an administrator wants to search a student’s record, he/she inputs student PRN and

the system searches the file and displays whether there is available or not, otherwise an

appropriate message is displayed. An administrator can also delete/modify a record of a student.

Design such system using c++ Program with file and exception handling.

**Output:**

D:\Object Oriented Programming\r>cd "d:\Object Orientedogramming\r\" && g++ rough.c++ -o rough && "d:\Object Onted Programming\r\"rough

\*\*\*\*\* Student Record System \*\*\*\*\*

1. Add Student Record

2. Search Student Record

3. Modify Student Record

4. Quit

Enter your choice: 1

Enter PRN: 123456789

Enter Student Name: Shreerang

Enter marks for Maths: 89

Enter marks for Physics: 78

Enter marks for Chemistry: 97

Record added successfully!

\*\*\*\*\* Student Record System \*\*\*\*\*

1. Add Student Record

2. Search Student Record

3. Modify Student Record

4. Quit

Enter your choice: 2

Enter PRN to search: 123456789

Record found:

Enter PRN to modify: 123456789

Enter new marks for Maths: 91

Enter new marks for Physics: 92

Enter new marks for Chemistry: 93

Record modified successfully!

\*\*\*\*\* Student Record System \*\*\*\*\*

1. Add Student Record

2. Search Student Record

3. Modify Student Record

4. Quit

Enter your choice: 2

Enter PRN to search: 123456789

Record found:

PRN: 123456789

Name: Shreerang

Maths: 91

Physics: 92

Chemistry: 93

Total Percentage: 92%

Grade: A

\*\*\*\*\* Student Record System \*\*\*\*\*

1. Add Student Record

2. Search Student Record

3. Modify Student Record

4. Quit

Enter your choice: 4

Exiting program. Goodbye!

D:\Object Oriented Programming\r>

**Code:**

#include <iostream>

#include <fstream>

#include <string>

using namespace std;

class Student {

public:

    int prn;

    string name;

    float maths;

    float physics;

    float chemistry;

    float totalPercentage;

    char grade;

    // Member functions

    void calculatePercentageAndGrade() {

        totalPercentage = (maths + physics + chemistry) / 3.0;

        if (totalPercentage >= 90) {

            grade = 'A';

        } else if (totalPercentage >= 80) {

            grade = 'B';

        } else if (totalPercentage >= 70) {

            grade = 'C';

        } else if (totalPercentage >= 60) {

            grade = 'D';

        } else {

            grade = 'F';

        }

    }

};

void addStudentRecord() {

    ofstream outfile("students.txt", ios::app);

    if (!outfile.is\_open()) {

cerr << "Error opening file for writing!" << endl;

        return;

    }

    Student student;

    cout << "Enter PRN: ";

    cin >> student.prn;

    // Check if PRN already exists

    ifstream infile("students.txt");

    Student tempStudent;

    bool prnExists = false;

    while (infile >> tempStudent.prn >> tempStudent.name >> tempStudent.maths >> tempStudent.physics

    >> tempStudent.chemistry >> tempStudent.totalPercentage >> tempStudent.grade) {

        if (tempStudent.prn == student.prn) {

            prnExists = true;

            break;

        }

    }

    infile.close();

    if (prnExists) {

        cout << "PRN already exists. Please use modify option to update the record." << endl;

        return;

    }

    cout << "Enter Student Name: ";

    cin.ignore();

    getline(cin, student.name);

    cout << "Enter marks for Maths: ";

    cin >> student.maths;

    if (student.maths < 0) {

        cerr << "Error: Marks cannot be negative!" << endl;

        return;

    }

    cout << "Enter marks for Physics: ";

    cin >> student.physics;

    if (student.physics < 0) {

        cerr << "Error: Marks cannot be negative!" << endl;

        return;

    }

    cout << "Enter marks for Chemistry: ";

    cin >> student.chemistry;

    if (student.chemistry < 0) {

        cerr << "Error: Marks cannot be negative!" << endl;

        return;

    }

    // Calculate total percentage and grade

    student.calculatePercentageAndGrade();

    // Write to file

    outfile << student.prn << " " << student.name << " " << student.maths << " " << student.physics

    << " " << student.chemistry << " " << student.totalPercentage << " " << student.grade << endl;

    outfile.close();

    cout << "Record added successfully!" << endl;

}

void searchStudentRecord() {

    ifstream infile("students.txt");

    if (!infile.is\_open()) {

        cerr << "Error opening file for reading!" << endl;

        return;

    }

    int searchPRN;

    cout << "Enter PRN to search: ";

    cin >> searchPRN;

    Student student;

    bool found = false;

    while (infile >> student.prn >> student.name >> student.maths >> student.physics >>

    student.chemistry >> student.totalPercentage >> student.grade) {

        if (student.prn == searchPRN) {

            found = true;

            break;

        }

    }

    infile.close();

    if (found) {

        cout << "Record found:" << endl;

        cout << "PRN: " << student.prn << endl;

        cout << "Name: " << student.name << endl;

        cout << "Maths: " << student.maths << endl;

        cout << "Physics: " << student.physics << endl;

        cout << "Chemistry: " << student.chemistry << endl;

        cout << "Total Percentage: " << student.totalPercentage << "%" << endl;

        cout << "Grade: " << student.grade << endl;

    } else {

        cout << "Record not found." << endl;

    }

}

void modifyStudentRecord() {

    ifstream infile("students.txt");

    ofstream outfile("temp.txt");

    if (!infile.is\_open() || !outfile.is\_open()) {

        cerr << "Error opening file for reading or writing!" << endl;

        return;

    }

    int modifyPRN;

    cout << "Enter PRN to modify: ";

    cin >> modifyPRN;

    Student student;

    bool found = false;

    while (infile >> student.prn >> student.name >> student.maths >> student.physics >>

    student.chemistry >> student.totalPercentage >> student.grade) {

        if (student.prn == modifyPRN) {

            found = true;

            break;

        }

        outfile << student.prn << " " << student.name << " " << student.maths << " "

        << student.physics << " " << student.chemistry << " " << student.totalPercentage

        << " " << student.grade << endl;

    }

    if (!found) {

        cout << "Record not found." << endl;

        infile.close();

        outfile.close();

        return;

    }

    cout << "Enter new marks for Maths: ";

    cin >> student.maths;

    if (student.maths < 0) {

        cerr << "Error: Marks cannot be negative!" << endl;

        infile.close();

        outfile.close();

        return;

    }

    cout << "Enter new marks for Physics: ";

    cin >> student.physics;

    if (student.physics < 0) {

        cerr << "Error: Marks cannot be negative!" << endl;

        infile.close();

        outfile.close();

        return;

    }

    cout << "Enter new marks for Chemistry: ";

    cin >> student.chemistry;

    if (student.chemistry < 0) {

        cerr << "Error: Marks cannot be negative!" << endl;

        infile.close();

        outfile.close();

        return;

    }

    // Calculate total percentage and grade

    student.calculatePercentageAndGrade();

    // Write modified record to file

    outfile << student.prn << " " << student.name << " " << student.maths << " " << student.physics

    << " " << student.chemistry << " " << student.totalPercentage << " " << student.grade << endl;

    // Copy the rest of the records

    while (infile >> student.prn >> student.name >> student.maths >> student.physics >>

    student.chemistry >> student.totalPercentage >> student.grade) {

        outfile << student.prn << " " << student.name << " " << student.maths << " "

        << student.physics << " " << student.chemistry << " " << student.totalPercentage << " "

        << student.grade << endl;

    }

    infile.close();

    outfile.close();

    // Rename temp file to original file

    remove("students.txt");

    rename("temp.txt", "students.txt");

    cout << "Record modified successfully!" << endl;

}

int main() {

    int choice;

    do {

        cout << "\n\*\*\*\*\* Student Record System \*\*\*\*\*" << endl;

        cout << "1. Add Student Record" << endl;

        cout << "2. Search Student Record" << endl;

        cout << "3. Modify Student Record" << endl;

        cout << "4. Quit" << endl;

        cout << "Enter your choice: ";

        cin >> choice;

        switch (choice) {

            case 1:

                addStudentRecord();

                break;

            case 2:

                searchStudentRecord();

                break;

            case 3:

                modifyStudentRecord();

                break;

            case 4:

                cout << "Exiting program. Goodbye!" << endl;

                break;

            default:

                cout << "Invalid choice. Please enter a valid option." << endl;

        }

    } while (choice != 4);

    return 0;

}

















