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COMPUTER SCIENCE INVESTIGATORY PROJECT

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Roll NO.: 6645382

This is certified to be the bona fide project of work done by Sudip Ghosh of class XII COMPUTER SCIENCE in the computer lab of the Kendriya Vidyalaya during the year 2018-2019.

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OVERVIEW OF C++

C++, as we all know is an extension to C language and was developed by **Bjarne stroustrup** in 1979 at Bell Labs in Murray Hill, New Jersey, as an enhancement to the C language and originally named C with Classes but later it was renamed C++ in 1983. C++ is an intermediate level language, as it comprises a confirmation of both high level and low level language features. C++ is a statically typed, free form, multiparadigm, compiled general-purpose language.

C++ is an Object Oriented Programming language but is not purely Object Oriented. Its features like **Friend and virtual**, violate some of the very important OOPS features, rendering this language unworthy of being called completely Object Oriented. It's a middle level language.

C++ is a superset of C, and that virtually any legal C program is a legal C++ program.

Note: A programming language is said to use static typing when type checking is performed during compile-time as opposed to run-time.

Object-Oriented Programming

C++ fully supports object-oriented programming, including the four pillars of object-oriented development:

- 1.Encapsulation 2.Data hiding 3.Inheritance
- 4.Polymorphism 5.Standard Libraries

Standard C++ consists of three important parts:

1. The core language giving all the building blocks including variables, data types and literals, etc.
2. The C++ Standard Library giving a rich set of functions manipulating files, strings, etc.
3. The Standard Template Library (STL) giving a rich set of methods manipulating data structures, etc.

Benefits of C++ over C Language:

The major difference being OOPS concept, C++ is an object oriented language whereas C language is a procedural language. Apart from this there are many other features of C++ which gives this language an upper hand on C language.

Following features of C++ makes it a stronger language than C:

1. There is Stronger Type Checking in C++.

2. All the OOPS features in C++ like Abstraction, Encapsulation, Inheritance etc makes it more worthy and useful for programmers.
3. C++ supports and allows user defined operators (i.e Operator Overloading) and function overloading is also supported in it.
4. Exception Handling is there in C++.
5. The Concept of Virtual functions and also Constructors and Destructors for Objects.
6. Inline Functions in C++ instead of Macros in C language. Inline functions make complete function body act like Macro, safely.
7. Variables can be declared anywhere in the program in C++, but must be declared before they are used.

SYSTEM REQUIREMENTS FOR THE PROJECT:

➤ HARDWARE REQUIREMENTS:

Processor: Intel dual core or above

Processor speed: 1.0GHz and above

RAM: 512MB RAM or above

Hard disk: 10 GB hard disk and above

➤ SOFTWARE REQUIREMENTS:

Languages: C++

Software: Turbo C++ (by any company like neutron , Borland etc)

INTRODUCTION

This project of school management system allows us to create, search and delete the database of students and teachers. There are two classes, one of student having all the necessary attributes(name, class, roll, admission no., admission date, fees, blood group, stream, subjects).Another class of teachers having their name, qualification, experience, salary, phone no., and subject they teach.

Special care has been taken to keep everything authentic, and as indigenous as possible.

Header files used:

- `#include<iostream.h>`
- `#include<conio.h>`
- `#include<stdio.h>`
- `#include<process.h>`
- `#include<fstream.h>`
- `#include<string.h>`
- `#include<iomanip.h>`

Functions used:

- `Int main()`
- `Sizeof()`
- `Setw()`
- `Setfill()`
- `Gets()`
- `Puts()`

Source code

```
#include<iostream.h>
#include<conio.h>
#include<stdio.h>
#include<process.h>
#include<fstream.h>
#include<string.h>
#include<iomanip.h>
#define input1() gotoxy(30,15)
#define input2() gotoxy(37,16)
class student
{
    char admno[100];
    char ad_date[50];
    int fees;
    int roll_no;
    char subs[200];
    char bld_grp[10];
    char stream[20];
    void sub_allot()
    {
        char c,d;
        if(classes<=5)
            strcpy(subs,"English,Hindi,Maths,EVS");
        else if(classes<=8)
            strcpy(subs,"English,Hindi,Maths,Sanskrit,Science,SST");
        else if(classes<=10)
            strcpy(subs,"English,Hindi,Maths,Science,SST");
    }
}
```

```

else
if(classes<=12&&strcmpi(stream,"science")==0)
{
    cout<<"Choose b for BIOLOGY , c for C.S :
    ";
    cin>>c;
    cout<<"Choose m for MATHS , h for HINDI :
    ";
    cin>>d;
    if(c=='b'&&d=='m')
        strcpy(subs,"English,Chemistry,Physics,Biol
        ogy,Maths");
    else if(c=='c'&&d=='m')
        strcpy(subs,"English,Chemistry,Physics,Comp
        uter Science,Maths");
    else if(c=='b'&&d=='h')
        strcpy(subs,"English,Chemistry,Physics,Biol
        ogy,Hindi");
    else if(c=='c'&&d=='h')
        strcpy(subs,"English,Chemistry,Physics,Comp
        . Science,Hindi");
}
else
if(classes<=12&&strcmpi(stream,"arts")==0)
    strcpy(subs,"English,Hindi,History,Geography,
    Economics");
}
void fees_cal()
{
    if(classes>=11) fees=3000;
    else if(classes>=9) fees=2500;
    else if(classes>=5) fees=2000;
    else if(classes>=1) fees=1800;
}

```

```

}
public:
    char name[100];
    int classes;
void input()
{
    cout<<"\n\t\t*****STUDENT DATA
ENTRY*****\n";
    cout<<"Enter the name of the student: ";
    gets(name);
    cout<<"Enter the admission no. of the
student: ";
    gets(admno);
    cout<<"Enter the admission date of the
student(dd/mm/yyyy): ";
    gets(ad_date);
    cout<<"Enter the class of the student ";
    cin>>classes;
    if(classes>=11&&classes<=12)
    {
        cout<<"Enter stream: ";
        gets(stream);
    }
    sub_allot();
    cout<<"Enter roll no.: ";
    cin>>roll_no;
    cout<<"Enter blood group: ";
    gets(bld_grp);
    fees_cal();
    cout<<"\t\t*****#####*****
*****\n";
}
void display()

```

{

```

cout<<"\t\t*****STUDENT
PROFILE*****\n";
cout.setf(ios::left,ios::adjustfield);
cout<<setfill('-')<<setw(20)<<"\t\tAdmission
no"<<" "<<admno<<endl;
cout<<setfill('-')<<setw(20)<<"\t\tAdm.
date"<<" "<<ad_date<<endl;
cout<<setfill('-')<<setw(20)<<"\t\tName";
cout<<" ";
puts(name);
cout.setf(ios::left,ios::adjustfield);
cout<<setfill('-')<<setw(20)<<"\t\tClass"<<"
"<<classes<<endl;
    if(classes>=11&&classes<=12)
    {
        cout.setf(ios::left,ios::adjustfield);
        cout<<setfill('-
        ')<<setw(20)<<"\t\tstream"<<" ";
        puts(stream);
    }
cout.setf(ios::left,ios::adjustfield);
cout<<setfill('-
')<<setw(20)<<"\t\tFees(quarterly)"<<"
"<<fees<<endl;
cout<<setfill('-')<<setw(20)<<"\t\tRoll
no"<<" "<<roll_no<<endl;
cout<<setfill('-')<<setw(20)<<"\t\tBlood
group"<<" "<<bld_grp<<endl;
cout<<setfill('-
')<<setw(20)<<"\t\tSubjects"<<" ";
puts(subs);

```

```

cout<<"\t\t*****#####*****
**\n";
}

```

```

}student1;
class teacher
{
    public:
    char frst_nm[50];
    char lst_nm[50];
    char qual[100];
    int exp;
    char pay[10];
    char sub[20];
    char phn[14];
    void input()
    {
        cout<<"\n\t\t*****TEACHER DATA
ENTRY*****\n";
        cout<<"Enter First name: ";
        gets(frst_nm);
        cout<<"Enter Last name:: ";
        gets(lst_nm);
        cout<<"Enter qualification: ";
        gets(qual);
        cout<<"Enter experiance(year): ";
        cin>>exp;
        cout<<"Enter Subject he/she teaches: ";
        gets(sub);
        cout<<"Enter the salary per month: ";
        gets(pay);
        cout<<"Enter Phone Number: ";
    }
}

```

```

        gets(phn);
cout<<"\t\t*****#####*****\n";

}
void display()
{
    cout<<"\t\t*****TEACHER
    PROFILE*****\n";
    cout.setf(ios::left,ios::adjustfield);
    cout<<setfill('-')<<setw(20)<<"\t\tFirst
    name"<<" ";
    puts(frst_nm);
    cout<<setfill('-')<<setw(20)<<"\t\tLast
    name"<<" ";
    puts(lst_nm);
    cout<<setfill('-
    ')<<setw(20)<<"\t\tqualification"<<" ";
    puts(qual);
    cout<<setfill('-
    ')<<setw(20)<<"\t\texperiance(year)"<<" ";
    cout<<exp<<endl;
    cout<<setfill('-
    ')<<setw(20)<<"\t\tSubject"<<" ";
    puts(sub);
    cout<<setfill('-')<<setw(20)<<"\t\tsalary per
    month"<<" ";
    puts(pay);
    cout<<setfill('-')<<setw(20)<<"\t\tPhone
    Number"<<" ";
    puts(phn);
    cout<<"\t\t*****#####*****\n";
};

```

```

    }

}teacher1;

void main()
{
    int choice;
    char save;
    ifstream student_in,teacher_in; //FOR HANDLING
    STUDENT_DATA.DAT
    ofstream student_out,teacher_out; //FOR HANDLING
    TEACHER_DATA.DAT
    main_menu: //MAIN MENU
    clrscr();
    cout.setf(ios::left,ios::adjustfield);
    cout<<setfill('/')<<setw(80)<<"";
    cout<<"\n\n\t\t\tSCHOOL MANAGEMENT PROGRAM\n\n";
    cout<<setfill('/')<<setw(80)<<"";
    cout<<"\n\n\t\t\t\tMAIN SCREEN\n\n";
    cout<<"Enter your choice: "<<endl;
    cout<<"1.Students information"<<endl;
    cout<<"2.Teacher information"<<endl;
    cout<<"3.Exit program"<<endl;
    input1();
    cout<<"ENTER YOUR CHOICE:";
    input2();
    cin>>choice;
    switch(choice)
    {
        case 1: {
            student_menu://STUDENT MENU START
            clrscr();
            cout<<setfill('/')<<setw(80)<<"";

```



```

cout<<"\n\n\t\t\tSTUDENTS INFORMATION AND BIO DATA
SECTION\n\n";
cout<<setfill('/')<<setw(80)<<" ";
cout<<"\n\n";
cout<<"Enter your choice: "<<endl;
cout<<"1.Create new entry\n";
cout<<"2.Find and display entry\n";
cout<<"3.Search and delete a record\n";
cout<<"4.List all students\n";
cout<<"5.Jump to main\n";
input1();
cout<<"ENTER YOUR CHOICE:";
input2();
cin>>choice;
clrscr();
switch(choice)
{
    //STUDENT DATA ENTRY
    case 1:

student_out.open("student_data.dat",ios::binary|io
s::out|ios::app);
        student1.input();
        cout<<"Press Y to save and N to discard:";
        cin>>save;
        if(save=='y' || save=='Y')
        {
student_out.write((char*)&student1,sizeof(student1
));
            cout<<"\n \t\tData written
            successfully...";
        }
        else

```

```

        cout<<"\t\tData discarded...";

student_out.close();
cout<<"\npress any key two times to jump to
student menu...";
getch();
getch();
goto student_menu;

//STUDENT DATA SEARCH AND
DISPLAY
case 2:{
    char full_name[100];
    char found='f';
    cout<<"\t\t*****SEARCH RECORD AND
    DISPLAY*****\n";
    cout<<"Enter the full name of the student:
    ";
    gets(full_name);
student_in.open("student_data.dat",ios::binary|ios
::in);
    while(!student_in.eof())
    {
student_in.read((char*)&student1,sizeof(student1))
;
        if(student_in.eof()) break;
        if(strcmpi(student1.name,full_name)==0)
        {
            found='t';
            cout<<"\tData found...\n";
            student1.display();

        }
    }
}

```

```

    }
    if(found=='f')
        cout<<"\n\t\tdata not found...";
        student_in.close();
        cout<<"\npress any key two times to
        jump to student menu...";
        getch();
        getch();
        goto student_menu;
    }

        //STUDENT DATA SEARCH AND Delete
case 3:
{
    char full_name[100];
    char found='f',confirm='n';
    cout<<"\t\tSTUDENT'S RECORD DELETION
    SECTION\n\n\n";
    cout<<"Enter the full name of the student
    to be deleted: ";
    gets(full_name);
student_in.open("student_data.dat",ios::binary|ios
::in);
    ofstream
    file("temp.dat",ios::out|ios::binary);
    while(!student_in.eof())
    {
student_in.read((char*)&student1,sizeof(student1))
;
        if(student_in.eof()) break;
        if(strcmpi(student1.name,full_name)==0)
        {
            found='t';

```

```

        cout<<"Data found...\n";
        student1.display();
        cout<<"Are you sure you want to
        delete this record? [y/n]";
        cin>>confirm;
        if(confirm=='n')
file.write((char*)&student1,sizeof(student1));
        }
        else
file.write((char*)&student1,sizeof(student1));
        }
        if(found=='f')
            cout<<"\n\t\tdata not found...";
            student_in.close();
            file.close();
            remove("student_data.dat");
            rename("temp.dat","student_data.dat");
            cout<<"\npress any key two times to
            jump to student menu...";
            getch();
            getch();
            goto student_menu;
    }

    case 4:
        {int i=1;
student_in.open("student_data.dat",ios::binary|ios
::in);
            cout<<"sl.no.\tNAME\n";
            while(!student_in.eof())
            {
student_in.read((char*)&student1,sizeof(student1))
;
                if(student_in.eof()) break;

```

```

        cout<<i<<"\t"<<student1.name<<"\t"<<endl;
        i++;

    }
    student_in.close();
    i=1;
    cout<<"\npress any key two times to jump to
    student menu...";
    getch();
    getch();
    goto student_menu;}
case 5:
    goto main_menu;
default:
    goto student_menu;
}

}

case 2:
{
    teacher_menu:        //TEACHERS MENU
        clrscr();
    cout<<setfill('/')<<setw(80)<<"";
    cout<<"\n\n\t\t\tTEACHERS INFORMATION AND BIO DATA
    SECTION\n\n";
    cout<<setfill('/')<<setw(80)<<"";
    cout<<"\n\n";
    cout<<"Enter your choice: "<<endl;
    cout<<"1.Create new entry\n";
    cout<<"2.Find and display entry\n";
    cout<<"3.Search and delete a record\n";

```

```

cout<<"4.List all students\n";
cout<<"5.Jump to main\n";
input1();
cout<<"ENTER YOUR CHOICE:";
input2();
cin>>choice;
clrscr();
switch(choice)
{
    //TEACHER DATA ENTRY
    case 1:
teacher_out.open("teacher_data.dat",ios::binary|ios::out|ios::app);
        teacher1.input();
        cout<<"\n\nPress Y to save and N to discard:";
        cin>>save;
        if(save=='y' || save=='Y')
        {
teacher_out.write((char*)&teacher1,sizeof(teacher1));

            cout<<"\n \t\tData written successfully...";
        }
        else
            cout<<"\t\tData discarded...";
        teacher_out.close();
        cout<<"\npress any key two times to jump to teacher's menu...";
        getch();
        getch();
        goto teacher_menu;

```

//TEACHER DATA SEARCH AND DISPLAY

```

case 2:{
    char full_name[100];
    char found='f';
    cout<<"\t\t*****SEARCH RECORD AND
    DISPLAY*****\n";
    cout<<"Enter the first name of the teacher:
    ";
    gets(full_name);
    teacher_in.open("teacher_data.dat",ios::binary|ios
    ::in);
    while(!teacher_in.eof())
    {
    teacher_in.read((char*)&teacher1,sizeof(teacher1))
    ;

        if(teacher_in.eof()) break;
        if(strncmp(teacher1.first_nm,full_name)=
        =0)
        {
            found='t';
            cout<<"\tData found...\n";
            teacher1.display();
        }
    }
    if(found=='f')
        cout<<"\n\t\tdata not found...";
        teacher_in.close();
        cout<<"\npress any key two times to
        jump to teacher's menu...";
        getch();
        getch();
        goto teacher_menu;
}

```

```

    }

    //TEACHER DATA SEACH AND DELETE
case 3:
    {
        char full_name[100];
        char found='f',confirm='n';
        cout<<"\t\t\tTEACHER'S RECORD DELETION
        SECTION\n\n\n";
        cout<<"Enter the first name of the teacher
        to be deleted: ";
        gets(full_name);
        teacher_in.open("teacher_data.dat",ios::binary|ios
        ::in);
        ofstream
        file("temp.dat",ios::out|ios::binary);
        while(!teacher_in.eof())
        {
            teacher_in.read((char*)&teacher1,sizeof(teacher1))
            ;
            if(teacher_in.eof()) break;
            if(strcmpi(teacher1.frst_nm,full_name)=
            =0)
            {
                found='t';
                cout<<"\t\t\tData found...\n";
                teacher1.display();
                cout<<"Are you sure you want to
                delete this record? [y/n]";
                cin>>confirm;
                if(confirm=='n')
                    file.write((char*)&teacher1,sizeof(teacher1));
            }
        }
    }
}

```



```

        else
file.write((char*)&teacher1,sizeof(teacher1));
    }
    if(found=='f')
        cout<<"\n\t\tdata not found...";
        teacher_in.close();
        file.close();
        remove("teacher_data.dat");
        rename("temp.dat","teacher_data.dat");
        cout<<"\npress any key two times to
        jump to student menu...";
        getch();
        getch();
        goto student_menu;
}

case 4:
    {int i=1;
teacher_in.open("teacher_data.dat",ios::binary|ios
::in);
        cout<<"sl.no.\tNAME\n";
        while(!teacher_in.eof())
        {
teacher_in.read((char*)&teacher1,sizeof(teacher1))
;
            if(teacher_in.eof()) break;
            cout<<i<<".\t"<<teacher1.frst_nm<<"
            "<<teacher1.lst_nm<<endl;
            i++;

        }
        teacher_in.close();
        i=1;
    }

```

```
        cout<<"\npress any key two times to jump to
        student menu...";
        getch();
        getch();
        goto teacher_menu;}
case 5:
    goto main_menu;
default:
    goto teacher_menu;
}
}
case 3:
    exit(0);
default:
    goto main_menu;
}

}
```

Output:

```
"C:\Users\win8\Desktop\c++\schoolmanage.exe"

////////////////////////////////////
                                SCHOOL MANAGEMENT PROGRAM
////////////////////////////////////

                                MAIN SCREEN

Enter your choice:
1.Students information
2.Teacher information
3.Exit program

                                ENTER YOUR CHOICE :
```

```
"C:\Users\win8\Desktop\c++\schoolmanage.exe"

////////////////////////////////////
                                TEACHERS INFORMATION AND BIO DATA SECTION
////////////////////////////////////

Enter your choice:
1.Create new entry
2.Find and display entry
3.Search and delete a record
4.List all students
5.Jump to main

                                ENTER YOUR CHOICE :
```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

*****TEACHER DATA ENTRY*****
Enter First name: trayee
Enter Last name:: roy
Enter qualification: B.Sc,B.Ed
Enter experience(year): 5
Enter Subject he/she teaches: chemistry
Enter the salary per month: 30000
Enter Phone Number: 7890651234
*****#####*****

Press Y to save and N to discard:y

Data written successfully...
press any key two times to jump to teacher's menu...

```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

*****SEARCH RECORD AND DISPLAY*****
Enter the first name of the teacher: trayee
Data found...
*****TEACHER PROFILE*****
First name----- trayee
Last name----- roy
qualification----- B.Sc,B.Ed
experience(year)-- 5
Subject----- chemistry
salary per month-- 30000
Phone Number----- 7890651234
*****#####*****

press any key two times to jump to teacher's menu...

```

```
"C:\Users\win8\Desktop\c++\schoolmanage.exe"

TEACHER'S RECORD DELETION SECTION

Enter the first name of the teacher to be deleted: moumi
Data found...
*****TEACHER PROFILE*****
First name----- Moumi
Last name----- sarkar
qualification----- B.Sc,B.Ed
experiance(year)-- 2
Subject----- English
salary per month-- 30000
Phone Number----- 9086734512
*****#####*****
Are you sure you want to delete this record? [y/n]y
press any key two times to jump to student menu...
```

```
"C:\Users\win8\Desktop\c++\schoolmanage.exe"

////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
STUDENTS INFORMATION AND BIO DATA SECTION
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////

Enter your choice:
1.Create new entry
2.Find and display entry
3.Search and delete a record
4.List all students
5.Jump to main

ENTER YOUR CHOICE:
```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

*****STUDENT DATA ENTRY*****
Enter the name of the student: dipika biswas
Enter the admission no. of the student: 129
Enter the admission date of the student(dd/mm/yyyy): 12/12/2009
Enter the class of the student 12
Enter stream: science
Choose b for BIOLOGY , c for C.S : b
Choose m for MATHS , h for HINDI : m
Enter roll no.: 12
Enter blood group: a-ve
*****#####*****
Press Y to save and N to discard:y

Data written successfully...
press any key two times to jump to student menu...

```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

*****SEARCH RECORD AND DISPLAY*****
Enter the full name of the student: dipika biswas
Data found...
*****STUDENT PROFILE*****
Admission no----- 129
Adm. date----- 12/12/2009
Name----- dipika biswas
Class----- 12
stream----- science
Fees(quarterly)---- 3000
Roll no----- 12
Blood group----- a-ve
Subjects----- English,Chemistry,Physics,Biology,Maths
*****#####*****

press any key two times to jump to student menu...

```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

List all students:
sl.no.  NAME
1.      Sounak Saha
2.      Abhijit Roy
3.      Sandip Ghosh
4.      Somnath malo
5.      Sudip ghosh
6.      dipika biswas

press any key two times to jump to student menu...

```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

*****STUDENT DATA ENTRY*****
Enter the name of the student: Sudip ghosh
Enter the admission no. of the student: 004
Enter the admission date of the student(dd/mm/yyyy): 21/07/2007
Enter the class of the student 12
Enter stream: science
Choose b for BIOLOGY , c for C.S : c
Choose m for MATHS , h for HINDI : m
Enter roll no.: 25
Enter blood group: a+ve
*****#####*****
Press Y to save and N to discard:

```

```

"C:\Users\win8\Desktop\c++\schoolmanage.exe"

STUDENT'S RECORD DELETION SECTION

Enter the full name of the student to be deleted: somnath malo
Data found...
*****STUDENT PROFILE*****
Admission no----- 211
Adm. date----- 28/04/2008
Name----- Somnath malo
Class----- 10
Fees(quarterly)---- 2500
Roll no----- 1
Blood group----- a+ve
Subjects----- English,Hindi,Maths,Science,SST
*****#####*****
Are you sure you want to delete this record? [y/n]y
press any key two times to jump to student menu...

```

BIBLIOGRAPHY:

1. Computer Science with C++ **(SUMITA ARORA)**
CLASS XII
2. **UNDERSTANDING C++.**
3. Website: [https:// fahad-cprogramming.blogspot.com](https://fahad-cprogramming.blogspot.com)