



NATIONAL

Output :-

- Enter principle amount : 2000
- Enter rate : 10
- Enter the time period : 2
- The simple interest amount is : 400



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Program - 1

- Aim :- Write a program to calculate simple interest.
- Programming :-

#include <iostream>

using namespace std;

int main()

{

int p, r, t;

cout << "Enter principle amount:";

cin >> p;

cout << "Enter Rate:";

cin >> r;

cout << "Enter time period:";

cin >> t;

$i = (p * r * t) / 100;$

cout << "The simple interest amount is: " << i << endl;

return 0;

}

Output :-

Enter employee details

Enter employee name -> Ram

Enter employee identity number -> 1022

Enter the salary -> 500000

Enter the employee address -> Udaipur

The details of employee is :- Ram | 1022 | 500000 |
udaipur



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Program-2.

Aim:- WAP to maintain the record of an employee using a structure.

Program:-

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

```
struct employee
```

```
{ string name;
```

```
int emp_id;
```

```
int salary;
```

```
string address;
```

```
};
```

```
int main()
```

```
{
```

```
cout << "Enter the employee details";
```

```
cout << "Enter employee name -->";
```

```
cin >> et.name;
```

```
cout << "Enter employee identity number -->";
```

```
cin >> et.emp_id;
```

```
cout << "Enter the salary -->";
```

```
cin >> et.salary;
```

```
cout << "Enter the employee address -->";
```



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cin >> el. address ;
cout << "

cout << " In the details of employee 1 is :- " <<
name << '1' << El.emp_id << " | " << El. salary << " | "
<< El. address << endl;

return 0;
3



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Program - 3

Aim:- WAP to create a class named "Student", having data of student as its data members. Maintaining the record of 3 students using 3 diff. obj. of this class.

Program :-

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

```
#define MAX 10
```

```
class Student
```

```
{
```

```
private :
```

```
char name[30];
```

```
int rollno;
```

```
int total;
```

```
float per;
```

```
public :
```

```
void getdata(void);
```

```
void putdata (void);
```

```
};
```

```
void student :: getdata (void) {
```

```
cout << " Enter name : " ;
```

```
cin >> name;
```

```
cout << " Enter roll Number : " ;
```

* O/P :-

* Enter details of 1st student :

Enter name : Riya

Enter Roll No : 50

Enter total marks out of 500 : 456

* Enter details of 2nd student :

Enter name : Mohit

Enter Roll No : 51

Enter total marks out of 500 : 398

* Enter details of 3rd student :

Enter Name : Preeti

Enter Roll No : 52

Enter total marks out of 500 : 350

* details of 1st student :

student details :

Name : Riya , Roll No : 50 , Total : 456 , Perc : 91.2

* details of 2nd student :

student details :

Name : Mohit , Roll No : 51 , Total : 398 , Perc : 79.6

* details of 3rd student :

student details :

Name : Preeti , Roll No : 52 , Total : 350 , Perc : 70

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cin >> rollNo;

cout << "Enter total marks out of 500:";
cin >> total;

perc = (float) total / 500 * 100;

void student :: putData (void) {

cout << "Student details :\n";

cout << "Name :" << name << "Roll Number :" <<
rollNo << "Total :" << total << "Percentage :" << perc;

int main()

{

student std1, std2, std3, std4, std5;

cout << "Enter details of 1st student :\n";

std1. getData();

cout << "Enter details of 2nd student :\n";

std2. getData();

cout << "Enter details of 3rd student :\n";

std3. getData();

cout << "Details of 1st student :\n";

for (std1. putData());

cout << "Details of 2nd student :\n";

std2. putData();

cout << "Details of 3rd student :\n";

std3. putData();

return 0;

Program to print Employee details

O/P :-

Enter details of 1 employee

Enter Employee Name : Ram

Enter Employee Id : 101

Enter Employee Salary : 100000

Detail of Employee

The record of employee

Name = Ram , ID = 101 , Salary = 100000



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Program - 4

Aim:- Write a C++ program to maintain the records of 10^3 employees using an array of 10^3 objects. The records must contain name, DOB, department, date of joining, salary etc.

Program:

```
#include <iostream>
```

```
class Employee
```

```
{
```

```
int Id;
```

```
char Name[25];
```

```
int Age;
```

```
long Salary;
```

```
public:
```

```
void Getdata()
```

```
{
```

```
cout << "Enter Employee Id: ";
```

```
cin >> Id;
```

```
cout << "Enter Employee Name: ";
```

```
cin >> Name;
```

```
cout << "Enter Employee Age: ";
```

```
cin >> Age;
```

```
cout << "Enter Employee Salary: ";
```



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3
cin >> salary;

void putdata()

cout << "In" << Id << "t" << Name << "t" << Age <<
"t" << Salary;

3;

void main()

{

int f;

Employee E[100];

for (i=0 ; i<2 ; i++)

cout << "Enter details of " << i+1 << " Employee";
E[i]. Getdata();

3

cout << "Details of Employee";

for (i=0 ; i<2 ; i++)

E[i]. Putdata();

return 0;

3



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Program - 5

Aim:- Write a C++ program to implement function overloading to add.

Program:-

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

```
int add (int, int);  
float add (float, float);  
double add (double, double);  
float add (int, float);  
double add (float, double);  
double add (int, double);
```

```
int main ()
```

```
{
```

```
int a, b, n;
```

```
float c, d, y1, y2;
```

```
double d1, d2, s1, s2, s3;
```

```
cout << "Enter two Integer \n";
```

```
cin >> a >> b;
```

```
a = add (a, b);
```

```
cout << "Sum of Integer : " << a << endl;
```

```
cout << "Enter two floating point no. \n";
```

```
cin >> c >> d;
```

QUESTION AND ANSWER OF ADDITION

O/P:-

Enter two Integer ~~2~~ ~~3~~ 3 5
sum of Integer : 8

Enter two floating no. 1.5 2.5
sum of floats : 4.0

Enter two double no. 1.1 2.2
sum of doubles : 3.3

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$y_1 = \text{add}(c, d);$

$\text{cout} \ll " \text{sum of floats: } " \ll y_1 \ll \text{endl};$

$\text{cout} \ll " \text{Enter two double numbers } ";$

$\text{cin} \gg d_1 \gg d_2;$

$s_1 = \text{add}(d_1, d_2);$

$\text{cout} \ll " \text{sum of floats is: } " \ll s_1 \ll \text{endl};$

$y_2 = \text{add}(a, c);$

$\text{cout} \ll " \text{Sum of one integer \& one float: } " \ll y_2 \ll \text{endl};$

$s_2 = \text{add}(d, d_1);$

$\text{cout} \ll " \text{sum of one float and one double: } " \ll s_2 \ll \text{endl};$

$s_3 = \text{add}(a, d_2);$

$\text{cout} \ll " \text{sum of one integer and one double: } " \ll s_3 \ll \text{endl}$
return 0;

}

int add (int x, int y)

{

 int sum;

 sum = x + y;

 return sum;

}

float add (float x, float y)

{

 float sum;

 sum = x + y;

 return sum;

}

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double add (double x, double y)
{

 double sum;

 sum = x+y;

 return sum;

}

float add (int x, float y)
{

 float sum;

 sum = x+y;

 return sum;

}

double add (float x, double y)
{

 double sum;

 sum = x+y;

 return sum;

}

double add (int x, double y)
{

 double sum;

 sum = x+y;

 return sum;

}

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Program- 6.

Aim:- Write a C++ program to allocate memory dynamically for 20 Integer using new operator. Also de-allocate the memory for the same using delete operator.

Program:-

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

```
int main()
{
    int * p = NULL;
    p = new int;
    if (!p)
        cout << " allocation of memory failed \n";
    else
    {
        for (int i = 0; i < n; i++)
            *p = 29;
        cout << " value of p " << *p;
    }
}
```

```
float a = new float (45.25)
cout << " value of a " << *a;
int n = 5;
int * q = new int [n]
```

QUESTION 3 (ANSWER)

O/P:-

value of p : 29

value of x : 75.25

value of store in block of memory = 1 2 3 4 5

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If ($\downarrow q$)

cout << " allocation of memory failed ";

else

{

for (int i=0; i<n; i++)

q[i] = i+1;

cout << " value stored in block of memory ";

for (int i=0; i<n; i++)

cout << q[i] << " ";

}

delete p;

delete d;

delete [] q;

return 0;

}



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Program - 7

Aim :- Write a program using default constructor, Parameterized constructor, copy constructor.

#include <iostream.h> // Stream

using namespace std;

class Sample {

private:

int x, y;

public:

Sample() {

x = 0;

y = 0;

cout << "Default constructor called";

}

Sample(int a, int b) {

x = a;

y = b;

cout << "Parameterized constructor called";

}

Sample(const Sample & obj) {

x = obj.x;

y = obj.y;

cout << "Copy constructor called";

}

Output :-

Default Constructor called

$x = 0$ $y = 0$

Parameterized Constructor called

$x = 10$ $y = 20$

Copy constructor called

$x = 10$ $y = 20$

Copy constructor is called when we pass object as argument.

Copy constructor is called when we return object from function.

Copy constructor is called when we assign one object to another object.

Copy constructor is called when we pass object as argument.



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```
void display () {  
    cout << "x = " << x << " y = " ;  
}
```

```
};
```

```
int main () {
```

```
    sample s1 ;
```

```
    s1 . display ();
```

```
    sample s2 (10, 20) ;
```

```
    s2 . display ();
```

```
    sample s3 = s2 ;
```

```
    s3 . display ();
```

```
    return 0 ;
```

```
} return
```



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Experiment - 2

Aim:- Write a C++ program to maintain the record of an employee using a class. The record must contain name, DOB, department, date of joining, salary etc. Use 'this' pointer in the member functions of the class to point the current (invoking) object:

Program:-

```
#include <iostream>
```

```
class Employee
```

```
{
```

```
int Id;
```

```
char Name[25];
```

```
int Age;
```

```
long salary;
```

```
public:
```

```
void GetData()
```

```
{
```

```
cout << "Enter Employee Id: ";
```

```
cin >> this->Id;
```

```
cout << "Enter Employee Name: ";
```

```
cin >> this->Name;
```

```
cout << "Enter Employee Age: ";
```

```
cin >> this->Age;
```

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Output :-

Enter details of Employee

Enter Employee Id : 101

Enter Employee Name : Ankit

Enter Employee Age : 29



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cout << "Enter Employee salary";
cin >> this -> salary;

}

void PutData()

{

cout << " " << this -> Id << " " << this -> Name <<
" " << this -> Age << " " << this -> salary;

}

};

void main()

{

int i;

Employee E;

cout << "Enter details of Employee";

E. GetData();

cout << "Enter details of Employee";

E. PutData();

return 0;

}



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Program : 9

Aim :- WAP of C++ to create two classes named father and mother. Accessible private data member of this class outside of it using a friend function.

#include <iostream>
using namespace std;

class mother;

class father
{

int x;

public :

void getdata ()

{

cout << "Enter the value of x";

cin >> x;

}

friend void add (father A, mother B);

class mother
{

int y;

public :

void getdata ()

{

WAP TO COMPUTE SUM OF TWO NUMBERS

Programmer : [REDACTED]
Date : [REDACTED]

Output : [REDACTED]

Enter the value of x : 10
Enter the value of y : 20
add = 30

Ques. Write a C program to add two numbers.

Ans. Solution of the question is given below:

#include <stdio.h>

int main()

{

 int a, b, sum;



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cout << Enter the value of y "

cin > y ;

3

friend void add (father A , Mother B)

void add (father A , mother B)

f

cout << " Add = " << A . a << B . y ;

3

void main ()

{

father A ;

Mother B ;

A . getData () ;

B . getData () ;

add (A , B) ;

3

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Program : 9

Aim :- WAP of C++ pr to create two classes named father and mother. Accessible, private, data member of this class outside of it using a friend function.

#include <iostream>
using namespace std;

class mother ;

class father

{

int x;

public :

void getdata ()

{

cout << "Enter the value of x";

cin >> x;

}

friend void add (father A, mother B);

class mother

{

int y;

public :

void getdata ()

{

PROGRAMMING IN C LANGUAGE

(using functions)

E. program

function example with address of a + 2 for 29 & 1 - 10

Output: An address within the main

program is written with 10 for address

Enter the value of x : 10

Enter the value of y : 20

add = 30

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cout << " Enter the value of y "

cin >> y;

3

friend void add (father A , Mother B)

void add (father A , mother B)

{

cout << " add = " << A . a << B . y ;

3

void main ()

{

father A ;

Mother B ;

A . getdata ();

B . getdata ();

add (A,B);

3 vim?

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Experiment - 10

Ques :- WAP to C++ to making a fun friend of one class.

⇒ #include <iostream>

using namespace std;

class test

{

int a, b;

public:

void Input()

{

cin >> a >> b;

}

friend void sum(test);

};

void sum(test y)

{

int c;

c = y.a + y.b;

cout << "sum = " << c;

}

void main()

{

test t1;

t1.Input();

sum(t1);

}

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Experiment - 11

Aim :- Making a "fun" friend of two classes.

⇒ #include <iostream>

using namespace std;

class B;

class A

{

int a;

public:

void Input_of_A()

}

Cin >> a;

}

friend void man(A, B);

};

class B

{

int b;

public:

void Input_of_B()

}

Cin >> b;

}

friend void Max(A, B);

};

void main()

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{

A a₁ ;

B b₁ ;

a₁. Input_of_A();

b₁. Input_of_B();

Max(A₁, b₁);

3

void max (A+1, B+2)

{

if (t1.a > t2.b)

cout << " A is greater";

else

cout << " B is greater";

3

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Experiment - 12

Aim :- Making one class friend of another class

⇒ #include <iostream>

using namespace std;

class second;

{ class first

{ }

int a, b;

public:

void input()

{

cin >> a >> b;

}

friend class second;

}

class second

{

int c;

public:

void sum(first t1)

{

c = t1.a + t1.b;

cout << c;

}

}

void main()

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first f1;

second s1;

f1. Input();

s1. sum(f1);

3

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Name.....Lavina.....Skumboli.....Class.....Sem.....S. No.....

Experiment - 13

- Aim :- WAP to Implement Single Inheritance

- program:-

#include <iostream>

using namespace std;

class A

{

int a;

public :

int b;

void get()

{

cout << "Enter the value of a & b";

cin >> a >> b;

~~void~~ 3

void get(a)

{

return a;

}

};

class B : public class A

{

int c;

public :

int mult()

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Name.....Lavina Jamboli.....Class.....Sem.....S. No.....

{

c = b * get_a();

cout << "c = " << c;

}

void display()

{

cout << "a = " << geta();

cout << "b = " << b;

cout << "c = " << c;

void main()

{

B P;

P. get();

P. multi();

P. display();

P. b = 20;

P. multi();

P. display();

2

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Experiment - 14

Aim:- To write a C++ program to demonstrate multi level inheritance by printing student details, marks obtained in two subjects & total marks.

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

```
class student
```

```
{
```

protected :

```
int RN;
```

public :

```
int getRN()
```

```
cout << "Enter the RN";
```

```
cin >> RN;
```

```
return 0;
```

```
}
```

```
int putRN()
```

```
cout << "RN";
```

```
}
```

```
,
```

```
class test : public student
```

```
{
```

protected :

```
float sub1, sub2;
```

public :

```
int getmark()
```

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cout << "Enter the marks";

cin >> sub1 >> sub2;

return 0;

}

int putmarks()

{

cout << " sub1 = " << sub1 << " sub2 = " << sub2;

return 0;

}

,

class result : public test

{

int total;

public :

int display()

{

total = sub1 + sub2;

cout << " total = " << total;

return 0;

,

,

int main() {

result p;

p. getin();

p. putin();

p. getmarks();

p. putmarks();

p. display();

return 0;

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Experiment - 15

Aim :- WAP to demonstrate multiple inheritance.

#include <iostream>

using namespace std;

class A

{

protected :

int a;

public :

int geta() {

cout << "Enter the value of a" << endl;

cin >> a;

return a;

}

};

class B

{

protected :

int b;

public :

int getb() {

cout << "Enter the value of b" << endl;

cin >> b;

return b;

}

};

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class C : public A, public B
{

int c;

public :

int mult () =
{

c = a * b;

return 0;

}

int show () {

{

cout << "a = " << a << endl;

cout << " b = " << b << endl;

cout << " c = " << c << endl;

return 0;

}

};

int main ()

{

p. p;

p. geta();

p. getb();

p. mult();

p. show();

return 0;

}

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Experiment - 16

Aim :- WAP to demonstrate Hierarchical Inheritance.

→ #include <iostream>
using namespace std;
class A

{

protected :

int a, b;

public :

int geta() {

cout << "Enter the value of a" << endl;

cin >> a;

cout << "Enter the value of b" << endl;

cin >> b;

return 0;

}

}

Class B : public A

{

protected :

int c;

public :

int add() {

c = a+b;

return 0;

}

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Name Class Sem S.No.

Int display () {

cout << "c = " << c << endl;

}

};

class C : public A

{

Int d;

public :

Int mult ()

{

d = a * b;

return d;

}

};

Int main ()

{

G p;

p.get a();

p.mult();

p.show();

B v;

v.add();

v.display();

}

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Experiment - 17

Aim:- WAP to demonstrate static member variable and static member function.

```
#include <iostream>
```

```
using namespace std;
```

```
class demo
```

```
{
```

```
public :
```

```
static int a;
```

```
int b;
```

```
demo (int x)
```

```
{
```

```
    b = x;
```

```
    a++;
```

```
}
```

```
void show()
```

```
{
```

```
    cout << "a = " << a << endl;
```

```
    cout << "b = " << b << endl;
```

```
    cout << endl;
```

```
}
```

```
static void show_count()
```

```
{
```

```
    cout << "Total object created(a) = " << a << endl;
```

```
}
```

```
};
```

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Name..... Class..... Sem..... S. No.....

Int demo : i a=0;

Int main()

{

demo d₁(10), d₂(20), d₃(30);

d₁. show();

d₂. show();

d₃. show();

demo :: showcount()

return 0;

}

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Name..... Class..... Sem..... S. No.....

Experiment - 19

Aim :- WAP to demonstrate operator overloading by creating a class that overloads the '+' operator to add two objects of the class.

⇒ #include <iostream>

using namespace std;

class sum

{

private :

int a;

public :

sum (int x=0)

{

a = x;

}

sum operator + (sum s)

{

sum temp ;

temp . a = a + s . a ;

return temp ;

}

void display ()

{

cout << "sum = " << a << endl ;

}

};

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Name.....Class.....Sem.....S. No.....

int main()

{

int n₁, n₂;

cout << "Enter number:";

cin >> n₁ >> n₂;

sum s₁(n₁), s₂(n₂), s₃;

s₃ = s₁ + s₂;

s₃ = display();

}

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Name : Class Sem S. No.

Experiment - 19

Aim :- To write C++ program to demonstrate runtime polymorphism using virtual fun. & base-class pointer with inheritance.

→ #include <iostream>

using namespace std;

class base

{

public :

virtual void display ()

{

cout << " In display Base " ;

}

void show ()

{

cout << " In show Base " ;

}

};

class derived : public base

{

void display ()

{

cout << " In display derived " ;

}

void show ()

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Name..... Class..... Sem..... S. No.....

?

cout << "In show derived";

?

g;

Int main()

?

base b;

derived d;

base * hptr;

hptr = & b;

hptr → display();

hptr → show();

hptr = & d;

hptr → display();

hptr → show();

return 0;

?

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Experiment - 20

Aim :- WAP in C++ to implement the friend class template

PLATE NUMBER

```
#include <iostream>
```

```
template < type, name T1, type, name T2 >
```

```
void show( T1, a, T2, b )
```

```
{
```

```
cout << a << b << endl;
```

```
}
```

```
void main()
```

```
{
```

```
show( "10", 's' )
```

```
show( '3.14', '10' )
```

```
show( 's', 3.14 )
```

```
}
```

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Name..... Class..... Sem..... S. No.....

#include <iostream>

template <class T>

circle

{

float a;

T x;

public:

void getRadius (T x)

{

x = x;

}

void main ()

a = 3.14 * x * x;

cout << "area = " << a;

3

};

void main ()

{

circle c;

c.getRadius (10);

c.getRadius (10.5);

c.area();

c.area();

3

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Name..... Class..... Sem..... S. No.....

Experiment - 21

Aim - WAP to implement file handling.

→ #include <iostream>

#include <fstream>

using namespace std;

void main()

{

ofstream ofile; // file to write

ifstream ifile; // file to read

char data[100];

ofile.open("sample.txt");

ofile << "Hello world" << endl;

cout << "Data written to file" << endl;

ofile.close();

ifile.open("sample.txt");

cout << "Data Read from the file" << endl;

ifile.close();

}