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Term work

on

OOPs with C++

(PCS 307)

2021-22

Submitted to:

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University Roll. No.: 2018322
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

GRAPHIC ERA HILL UNIVERSITY, DEHRADUN

ACKNOWLEDGMENT

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At last but not the least I greatly indebted to all other persons who directly or indirectly helped me during this course.

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B.Tech CSE-A-III Sem

Session: 2021-22

GEHU, Dehradun

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	Task1: Initialise all primary data types, assign their values and print them all? [char, bool, short, int, long, float, double, long double, wide char] **Task2:** Apply sizeof operator on all above operators and their variables? Example Int a = 10; Cout << Sizeof(int); Cout << Sizeof(a);	
6	Write C++ code for below mentioned tasks? **String related Questions in C++:** **Task1:** What happens if we add integer with a string, how the compiler would react to it? String str = "ABC"; Int a = 1; String str2 = str + a; **Task2:** Check the entered string is Palindrome or not? String str = "75457" Output: Yes it is a palindrome or No it is not a Palindrome. (Use, getline(sin, str1) and reverse_iterator of string to check this) **Task3:** Make a reverse of a string using reverse method and reverse_iterator of string class? **Task4:** String Compare: Check if the strings are equal or not? (do not use str1.compare(str2), do it manually) **Task5:** String Compare: Check the possible values string.compare() function will return? (Create cases in which compare function would return below values) X>0 X<0 X==0 X = -4 X = 5 X = -2104040... Also check the ASCII difference between two characters?(use int type cast)	41-52

	Task6: Check if string is mutable in C++ or not? String a = "Hello"; Cout << &a; a[0] = 'J'; Cout << &a; Cout << a; What is the output?	
7	Write C++ code for below mentioned tasks? **Array and 2D Array related Questions in C++:** **Task1:** Create a switch statement [Manual], In Which: a. When you pass 1 your program would print current year b. When you pass 2 your program would print current month c. When you pass 3 your program would print current day d. When you pass 4 your program would print Not applicable **Task2:** Create a switch statement [Using ctime], In Which: a. When you pass 1 your program would print current year b. When you pass 2 your program would print current month c. When you pass 3 your program would print current day d. When you pass 4 your program would print Not applicable **Task3:** v1. Print using reverse method: 1 2 3 9 8 7 4 5 6 ==> 6 5 4 7 8 9 3 2 1 v2. Print using (10- arr[i][j]) method: 1 2 3 9 8 7 4 5 6 ==> 6 5 4 7 8 9 3 2 1 v3. Restore using reverse method [without creating new array]: 1 2 3 9 8 7 4 5 6 ==> 6 5 4	53-78

7 8 9 3 2 1

v4. Restore using (10- arr[i][j]) method [without creating new array]:

1 2 3 9 8 7
4 5 6 ==> 6 5 4
7 8 9 3 2 1

Task4: Restore the same values in the same array, arr[3][3]:

1 2 3 1 1 1
4 5 6 ==> 2 2 2
7 8 9 3 3 3

v1. Use row loop [int i, for all j]

v2. Use arr[i][N-1]/3, at each place

v3. Use, arr[i][j]-(2*i+j)

Task5: Store these in an array[4][4] in given fassion and then print:

```
*
* *
* * *
* * * *
```

Task6: Store these in an array[4][4] in given fashion and then print:

```
* * * *
* * *
* *
*
```

Task7: Store these in an array[4][4] in given fashion and then print:

```
   *
  * *
 * * *
* * * *
```

Task8: Store these in an array[4][4] in given fashion and then print:

	* * * * * * * * * *	

8	Write C++ code for below mentioned tasks?
	Pointer, Function, Inline Function, Recursion in C++:
	Task1: Will the program through an error and if yes then why?
	int *p = {10,20,20};
	cout << *p;
	p++;
	cout << *p;
	Task2: Output of this program?
	V1. Issue?
	int arr[] = {10,20,30};
	cout << *arr;
	cout << arr;
	arr++;
	cout << *arr;
	V2. How to resolve above issue?
	int arr[] = {10,20,30};
	cout << *arr;
	cout << arr;
	cout << *(?);
	
	Task3: Output of this program?
	V1. Output?
	int a = 10;
	int *p;
	int **q;
	p = &a;
	q = &p;
	cou << *p;
	cou << **q;
		79-100

	V2. Change the value of a using q pointer to pointer.
	
	Task4: Find factorial of a number using function but not recurssion
	Task5: Find factorial of a number using recurssion
	Task6: Series Problem using recurssion for n series
	2, (2^2 + 2), (3^3 + 3), (4^4 + 4), (5^5 + 5), ...
	Hint:
	n * ((n-1)^(n-1) + (n-1))
	
	Task7: Perform Call by value, call by Address for swapping value of a and b:
	int a = 10;
	int b = 20;
	V1. Swap(a,b); //call by Value [void swap(int a, int b){}]
	V2. Swap(a,b); //call by Value [void swap(int &a, int &b){}]
	V3. Swap(&a,&b); //call by Address	

9	Write C++ code for below mentioned tasks? **Class, Object, Constructor, Static Data Members, friend function in C++:** **Task1: Class and Object in C++** a. WAP to assign and print the roll number, phone number and address of two students having names "Sam" and "John" respectively by creating two objects of the class 'Student'. b. WAP which would contain array of objects [many objects], of a class Student. Student [Name, Age, Year, section, marks], the section would be A,B,C and D. Your program would be able to return the total marks of students in the college. Hint [Make a Matrix or Tabular diagram to understand the problem], all the rows will differ each other by different objects of Student class [Student s1,s2,s3,s4]. **Task2: Constructor in C++** WAP to create a class to print the area of a square and a rectangle. The class has two functions with the same name but different number of parameters. The function for printing the area of rectangle has two parameters which are its length and breadth respectively while the other function for printing the area of square has one parameter which is the side of the square. Use multiple constructors to for the initialization.	101-110

	Task3: Static Data Members in C++ WAP to count the total number of calls for a member function from more than one objects. [Lets say, from 3 such Objects] **Task4: Friend Function in C++** WAP in which you create a Student class having basic information for each student, like name, age and marks. By using friend function add marks of all the students [lets say 3 objects] and print it. **Task5: Structure in C++** WAP to create a College class and Student Structure in C++ in one program. By providing such suitable examples write at least 5 differences between class and struct code your have written above. Hint [Access Specifiers, Heap and Stack, large and small memory, etc.] **Task6: Extra Questions:** WAP which would perform these tasks of your data: a. Come to next line b. set minimum field width c. fill string with (*) after setw(15) function **********1234 by using endl, setw, and setfill [Manipulators in C++]	
10	Write C++ code for below mentioned tasks? **Array of Objects, Pointer to Object, This pointer, Operator Overloading in C++** **Task1: Array of Objects in C++** WAP to create a directory that contains the following information. (a) Name of a person (b) Address (c) Telephone Number (if available with STD code) (d) Mobile Number (if available) (e) Head of the family **Task2: Pointer to Object in C++** WAP to create print or display Student information containing in Student class by using pointers to object. **Task3: This pointer in C++** WAP to pass two variables in a parameterized constructor during object creation and have same names variables as class member data and constructor parameters. Your job is to calculate the remainder of those two numbers. **Task4: Operator Overloading in C++** a). WAP, in which you write a friend function to overload a less than '<' operator in C++. b). WAP in which you can add two objects [every object would have 1 integer value] by overloading + operator, which eventually would add the data values of those two object by adding the objects.	111-120

11	Write C++ code for below mentioned tasks? **Task-11.1** Inheritance Basics: WAP in C++ to create a Parent and Child interaction using inheritance. With this Parent and Child Interaction try to perform these tasks: a. Call Parent class method in child class function without creating an object of parent class b. Call Parent class method in main method by child class object **Task-11.2** Multiple Inheritance in C++: Create two classes named Mammals and MarineAnimals. Create another class named BlueWhale which inherits both the above classes. Now, create a function in each of these classes which prints "I am mammal", "I am a marine animal" and "I belong to both the categories: Mammals as well as Marine Animals" respectively. Now, create an object for each of the above class and try calling 1 - function of Mammals by the object of Mammal 2 - function of MarineAnimal by the object of MarineAnimal 3 - function of BlueWhale by the object of BlueWhale 4 - function of each of its parent by the object of BlueWhale **Task-11.3** Dimond Problem in multiple inheritance using C++: a. WAP to illustrate Dimond Problem in multiple inheritance b. its solution using Virtual base classes. Write separate programs if required. c. What else multiple inheritance can cause in a program, explain it by providing proper solution	121-132
12	Write C++ code for below mentioned tasks? **Task-12.1** WAP to illustrate the role of Access Modifiers [private, public, protected] separately in: a. Accessing base class elements in derived class or Inheritance b. Accessing base class elements through object **Task-12.2** Execution flow of Constructors and Destructors in C++: a. WAP to illustrate the calling and execution flow of Constructors in inheritance. [L-2 Inheritance] b. WAP to illustrate the calling and execution flow of Destructors in inheritance. [L-2 Inheritance] c. Pass parameters to base class through derived class constructor. [L-1 Inheritance]	133-144

13	Write C++ code for below mentioned tasks? **Task 13.1** To overload add method for two parameters with int and float data types in Base class. Along with it create a Derived class from the Base class named as child. The class child should override one of the overloaded method from base class. Perform following tasks: 1. Try calling overriding method from child class object. 2. Write name of the method which is not seen by the child class object Create two versions: version 01: without 'using' keyword version 02: with 'using' keyword **Task 13.2** Base class having a virtual and a pure virtual function. Derived class having same copy of virtual function with changed logic and definition of pure virtual function. Perform following tasks: 1. Try to call child class overriding method from base class pointer. 2. Try to call child class definition of pure virtual function in child class. 3. Find out the abstraction in above implementation.	145-156
14	Write C++ code for below mentioned tasks? **Task 14.1** Illustrate the compile time and run time binding using base class pointer, which holds the address of child class **Task 14.2** Perform the following: 1. Call base class destructor from base class pointer which is holding the child class object. 2. Call child class destructor from base class pointer which is holding the child class object.	157-162
15	Write C++ code for below mentioned tasks? **Task 15.1** WAP in C++ to read and write from and to a file using ifstream and ofstream**.** **Task 15.2** WAP in C++ to perform these tasks: a. Read from a file using fstream [char by char] b. Write into a file using fstream c. Append into a file using fstream d. Count total number of characters, words and lines in a file **Task 15.3** WAP in C++ for IO manipulators mentioned below: a. **IOS:** hex,dec,skipws,noskipws b. **Istream:** ws	163-168

<table>
<tr><td></td><td>c. Ostream: endl, ends, flush
d. Iomanip: setW, setPrecision</td><td></td></tr>
<tr><td>16</td><td>Write C++ code for below mentioned tasks?

Task 16.1 WAP in C++ to create a genetic add function for given tasks:
a. Perform add over two integers and return integer
b. Perform add over one int and one float and return Double

Task 16.2 WAP in C++ to perform these tasks:
a. Catch a Divide by zero exception in z = x/y using "throw runtime_error"

b. What will be the output of this program and why?
<pre>#include <iostream>
using namespace std;

int main()
{
   try {
      throw 'a';
   }
   catch (int x) {
      cout << "Caught " << x;
   }
   catch (...) {
      cout << "Default Exception\n";
   }
   return 0;
}</pre>c. What will be the output of this program and why?
<pre>#include <iostream>
using namespace std;

int main()
{
   try {
      throw 'a';
   }
   catch (int x) {
      cout << "Caught ";
   }
   return 0;
}</pre>d. Rethrow and catch an exception by creating a separate user defined divide function for condition divide by zero.</td><td>169 – 178</td></tr>
</table>

17	**WAP in C++ with the help of STL:** **a. List:** 1. Iterate a int list using iterator and print it 2. Find size of a list 3. Sort a list 4. Reverse a list **b. Vector:** 1. Insert elements into a int vector 2. Iterate this vector using iterator and print it 3. Find size of a capacity and max size of a vector 4. Resize a vector 5. checks if the vector is empty or not **c. Map:** 1. Insert elements into a <int, string> map 2. insert elements in random order 3. Iterate this map using iterator and print its keys and values 4. Find an element as key from this map 5. assigning the elements from map1 to map2 6. remove all elements with key = x (any key present in map) 7. Find size, max size of a map 8. checks if this map is empty or not 9. Clear a map **d. Algorithm:** 1. Covert an Array into a Vector 2. Sort a Vector 3. Reverse a vector 4. Max element in a Vector 5. Min element in a Vector 6. Occurrences of x in a vector 7. Sort an Array 8. Binary Search in an Array	179-186

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DEPARTMENT OF CSE
B.Tech. CSE
STUDENT LAB REPORT SHEET

Photograph
Passport Size

Name of Student - Dikshant Joshi Mob.No…….

Address Permanent ……..

Father's Name ……Occupation ……MoNo……

Mother's Name …… …..Occupation……MoNo……

Section ……Branch……Semester……Class Roll No ..... Grade A B C

Local Address……Email…… Marks 5 3 1

S.No.	Practical	D.O.P.	Date of Submission	Grade (Viva)	Grade (Report File)	Total Marks (out of 10)	Student's Signature	Teacher's Signature
1	Practical-01	23.09.21	23.09.21				Dikshant	
2	Practical-02	23.09.21	23.09.21				Dikshant	
3	Practical-03	02.10.21	02.10.21				Dikshant	
4	Practical-04	02.10.21	02.10.21				Dikshant	
5	Practical-05	07.10.21	07.10.21				Dikshant	
6	Practical-06	07.10.21	07.10.21				Dikshant	
7	Practical-07	17.10.21	18.10.21				Dikshant	
8	Practical-08	21.10.21	22.10.21				Dikshant	
9	Practical-09	28.10.21	30.10.21				Dikshant	
10	Practical-10	28.10.21	30.10.21				Dikshant	
11	Practical-11	14.12.21	14.12.21				Dikshant	

12	**Practical-12**	14.12.21	14.12.21				Dikshant	
13	**Practical-13**	27.12.21	14.12.21				Dikshant	
14	**Practical-14**	27.12.21	27.12.21				Dikshant	
15	**Practical-15**	03.01.21	03.01.21				Dikshant	
16	**Practical-16**	03.01.21	03.01.21				Dikshant	
17	**Practical-17**	06.01.21	06.01.21				Dikshant	

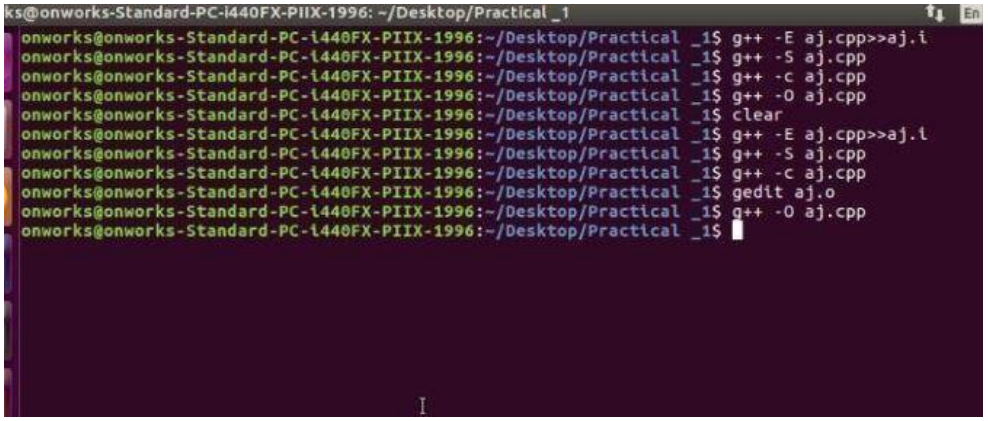
Practical 1

1.1-

Source code :-

```
#include<iostream> #
define MAX 20 using
namespace std;

int main()
{
int n = MAX;
cout<<"indian army/n";
cout<<n;
return 0;
}
```

Output

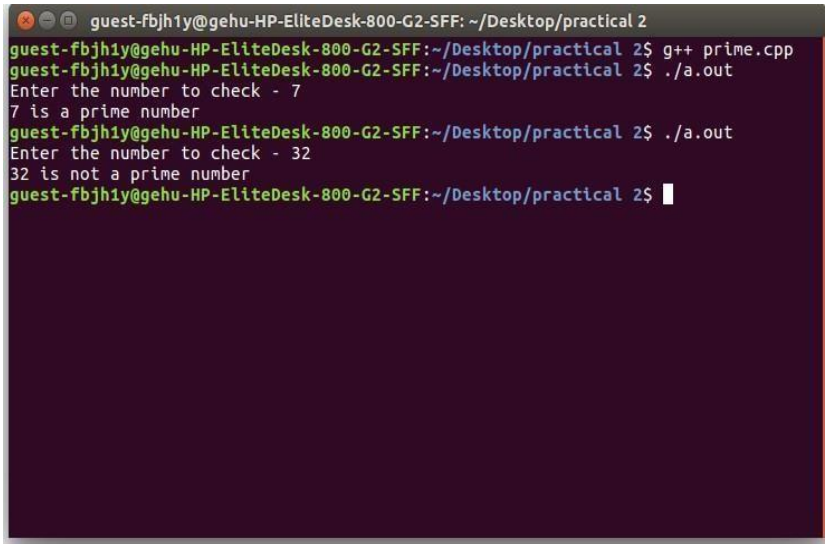

ks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/Practical _1
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -E aj.cpp>>aj.i
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -S aj.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -c aj.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -O aj.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ clear
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -E aj.cpp>>aj.i
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -S aj.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -c aj.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ gedit aj.o
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$ g++ -O aj.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/Practical _1$

Practical 2

2.
Source Code:-

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

int main()
{
int n,i,f=1;
cout<<"Enter the number to check - ";
cin>>n;

for(i=2;i<sqrt(n);i++)
{
if(n%i==0)
{
f=0;
break;
}
}
if(f==0)
{
cout<<n<<" is not a prime number"<<endl;
}
else
{
cout<<n<<" is a prime number"<<endl;
}
return 0;
}
```

OUTPUT:-

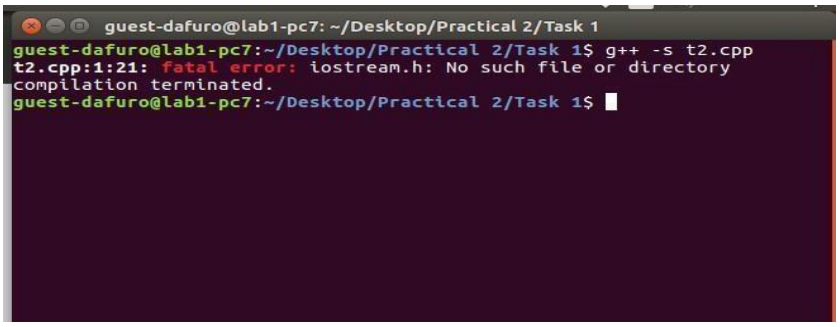

guest-fbjh1y@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/practical 2
guest-fbjh1y@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/practical 2$ g++ prime.cpp
guest-fbjh1y@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/practical 2$ ./a.out
Enter the number to check - 7
7 is a prime number
guest-fbjh1y@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/practical 2$ ./a.out
Enter the number to check - 32
32 is not a prime number
guest-fbjh1y@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/practical 2$

PRACTICAL 3

3.1
Source code:-

```
#include<iostream.h>
using namespace std;
int main()
{
cout<<"hey brO";
return 0;
}
```

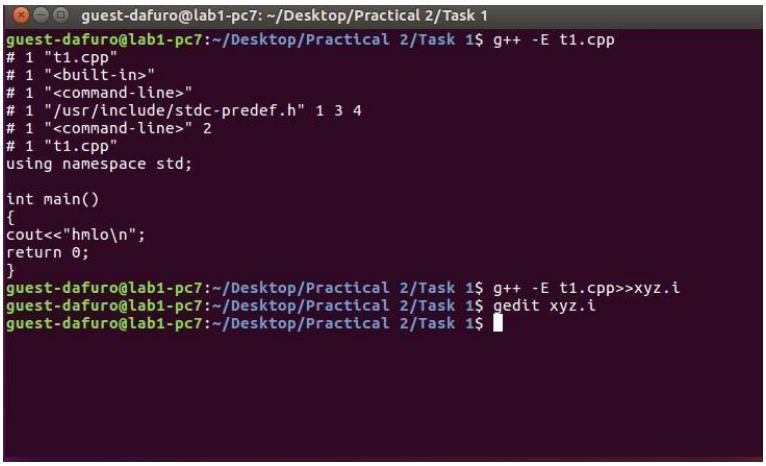
OUTPUT


guest-dafuro@lab1-pc7: ~/Desktop/Practical 2/Task 1
guest-dafuro@lab1-pc7:~/Desktop/Practical 2/Task 1$ g++ -s t2.cpp
t2.cpp:1:21: fatal error: iostream.h: No such file or directory
compilation terminated.
guest-dafuro@lab1-pc7:~/Desktop/Practical 2/Task 1$

3.2
Source code:-

```
using namespace std;

int main()
{
cout<<"hmlo\n";
return 0;
}
```

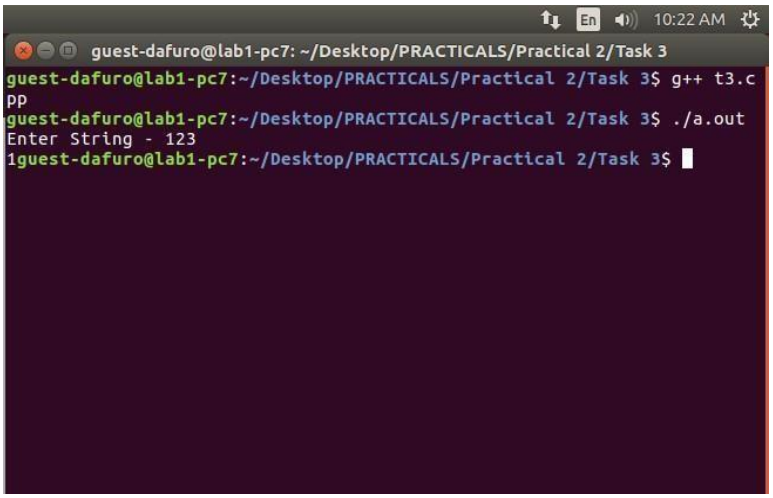
OUTPUT:-


guest-dafuro@lab1-pc7: ~/Desktop/Practical 2/Task 1
guest-dafuro@lab1-pc7:~/Desktop/Practical 2/Task 1$ g++ -E t1.cpp
1 "t1.cpp"
1 "<built-in>"
1 "<command-line>"
1 "/usr/include/stdc-predef.h" 1 3 4
1 "<command-line>" 2
1 "t1.cpp"
using namespace std;
int main()
{
cout<<"hmlo\n";
return 0;
}
guest-dafuro@lab1-pc7:~/Desktop/Practical 2/Task 1$ g++ -E t1.cpp>>xyz.i
guest-dafuro@lab1-pc7:~/Desktop/Practical 2/Task 1$ gedit xyz.i
guest-dafuro@lab1-pc7:~/Desktop/Practical 2/Task 1$

3.3
Source code:-

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

int main()
{
char a;
cout<<"Enter String - ";
cin>>a;
cout<<a;
return 0;
}
```

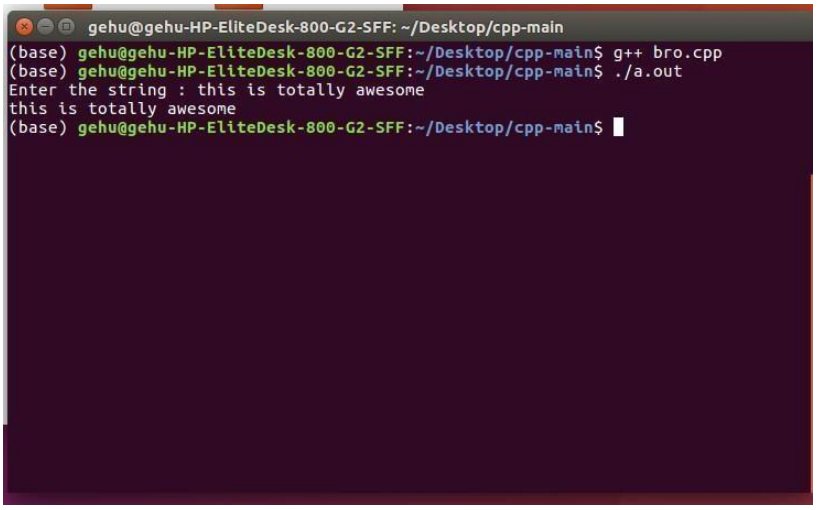
OUTPUT:-


10:22 AM
guest-dafuro@lab1-pc7: ~/Desktop/PRACTICALS/Practical 2/Task 3
guest-dafuro@lab1-pc7:~/Desktop/PRACTICALS/Practical 2/Task 3$ g++ t3.c
pp
guest-dafuro@lab1-pc7:~/Desktop/PRACTICALS/Practical 2/Task 3$ ./a.out
Enter String - 123
1guest-dafuro@lab1-pc7:~/Desktop/PRACTICALS/Practical 2/Task 3$

3.4
Source code:-

```
#include<iostream>

using namespace std;
int main()
{
string c;
cout<<"Enter the string : ";
getline(cin,c);

cout<<c<<"\n";
return 0;
}
```

OUTPUT:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main$ g++ bro.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main$ ./a.out
Enter the string : this is totally awesome
this is totally awesome
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main$

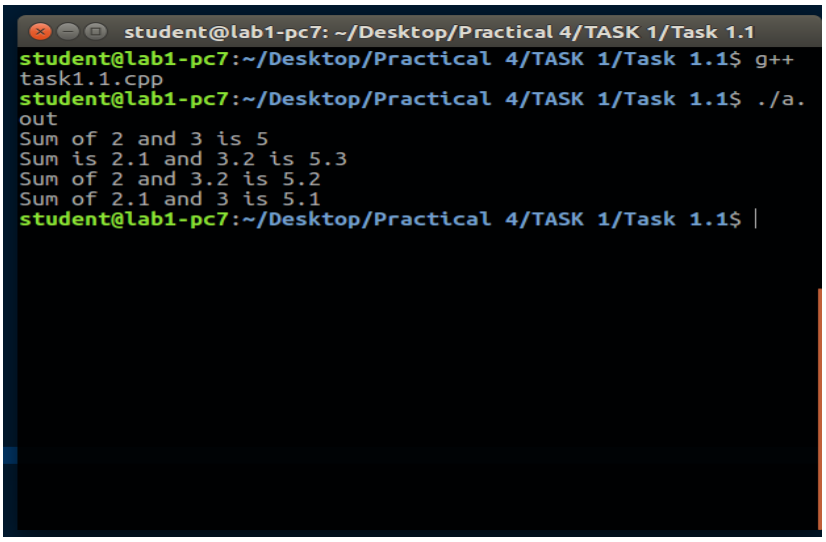
PRACTICAL 4

4.1

Source code:-

```
#include<iostream>
using namespace std;
namespace first
{
	int sum(int a,int b)
	{
		return(a+b);
	}
}

namespace second
{
	float sum(float a,float b)
	{
		return(a+b);
	}
}
int main()
{

	cout<<"Sum of 2 and 3 is "<<first::sum(2,3)<<"\n";
	cout<<"Sum is 2.1 and 3.2 is "<<second::sum(2.1,3.2)<<"\n";
	cout<<"Sum of 2 and 3.2 is "<<second::sum(2,3.2)<<"\n";
	cout<<"Sum of 2.1 and 3 is "<<second::sum(2.1,3)<<"\n";

}
```

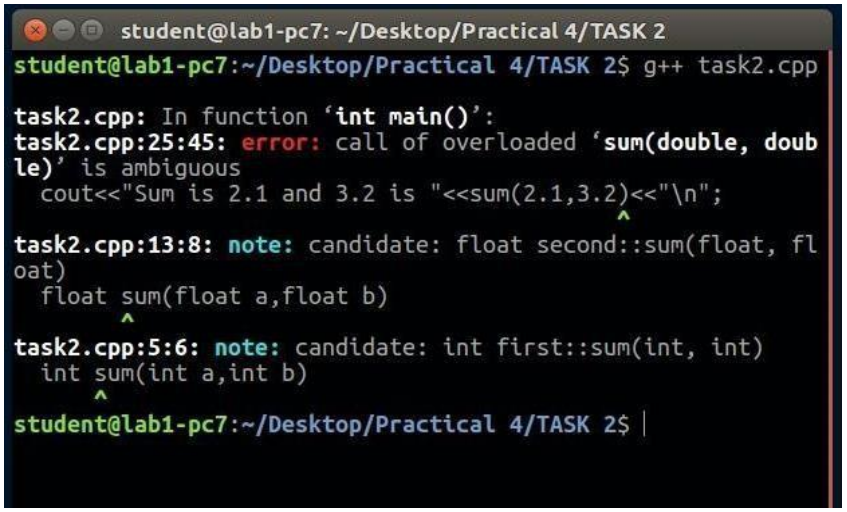
OUTPUT:-


student@lab1-pc7: ~/Desktop/Practical 4/TASK 1/Task 1.1
student@lab1-pc7:~/Desktop/Practical 4/TASK 1/Task 1.1$ g++
task1.1.cpp
student@lab1-pc7:~/Desktop/Practical 4/TASK 1/Task 1.1$ ./a.
out
Sum of 2 and 3 is 5
Sum is 2.1 and 3.2 is 5.3
Sum of 2 and 3.2 is 5.2
Sum of 2.1 and 3 is 5.1
student@lab1-pc7:~/Desktop/Practical 4/TASK 1/Task 1.1$

4.2
Source Code :-

```
#include<iostream>
using namespace std;
namespace first
{
	int sum(int a,int b)
	{
		return(a+b);
	}
}

namespace second
{
	float sum(float a,float b)
	{
		return(a+b);
	}
}

using namespace first;
using namespace second;
int main()
{

	cout<<"Sum of 2 and 3 is "<<sum(2,3)<<"\n";
	cout<<"Sum is 2.1 and 3.2 is "<<sum(2.1,3.2)<<"\n";
	cout<<"Sum of 2 and 3.2 is "<<sum(2,3.2)<<"\n";
	cout<<"Sum of 2.1 and 3 is "<<sum(2.1,3)<<"\n";

}
```

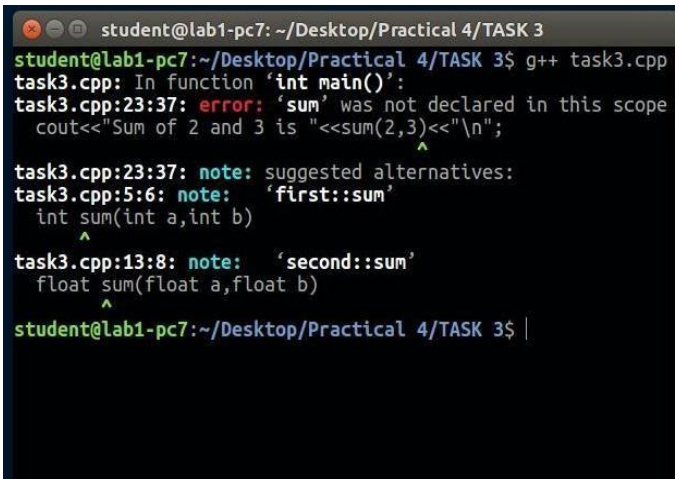
OUTPUT:-


student@lab1-pc7: ~/Desktop/Practical 4/TASK 2
student@lab1-pc7:~/Desktop/Practical 4/TASK 2$ g++ task2.cpp
task2.cpp: In function 'int main()':
task2.cpp:25:45: error: call of overloaded 'sum(double, double)' is ambiguous
cout<<"Sum is 2.1 and 3.2 is "<<sum(2.1,3.2)<<"\n";
task2.cpp:13:8: note: candidate: float second::sum(float, float)
float sum(float a,float b)
task2.cpp:5:6: note: candidate: int first::sum(int, int)
int sum(int a,int b)
student@lab1-pc7:~/Desktop/Practical 4/TASK 2$

4.3
Source Code :-

```
#include<iostream>
using namespace std;
namespace first
{
	int sum(int a,int b)
	{
		return(a+b);
	}
}

namespace second
{
	float sum(float a,float b)
	{
		return(a+b);
	}
}


int main()
{

	cout<<"Sum of 2 and 3 is "<<sum(2,3)<<"\n";
	cout<<"Sum is 2.1 and 3.2 is "<<sum(2.1,3.2)<<"\n";
	cout<<"Sum of 2 and 3.2 is "<<sum(2,3.2)<<"\n";
	cout<<"Sum of 2.1 and 3 is "<<sum(2.1,3)<<"\n";

}
```

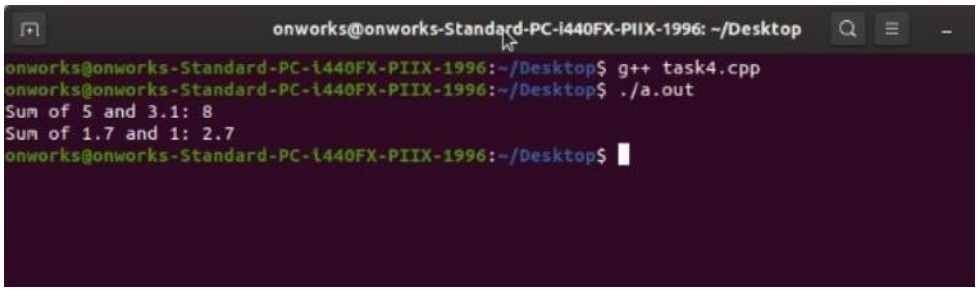
OUTPUT:-


student@lab1-pc7: ~/Desktop/Practical 4/TASK 3
student@lab1-pc7:~/Desktop/Practical 4/TASK 3$ g++ task3.cpp
task3.cpp: In function 'int main()':
task3.cpp:23:37: error: 'sum' was not declared in this scope
cout<<"Sum of 2 and 3 is "<<sum(2,3)<<"\n";
^
task3.cpp:23:37: note: suggested alternatives:
task3.cpp:5:6: note: 'first::sum'
int sum(int a,int b)
^
task3.cpp:13:8: note: 'second::sum'
float sum(float a,float b)
^
student@lab1-pc7:~/Desktop/Practical 4/TASK 3$

4.4
Source Code:-

```
#include<iostream>
using namespace std;
namespace first
{  int add(int a,int b )
   {
    return (a+b);
    }
};
namespace second
{
  float add(float a,float b)
  {
   return (a+b);
   }
};
int main()
{
cout<<"Sum of 5 and 3.1: "<<first::add(5,3.1)<<endl;
cout<<"Sum of 1.7 and 1: "<<second::add(1.7F,1)<<endl;
return 0;
}
```

OUTPUT:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ g++ task4.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./a.out
Sum of 5 and 3.1: 8
Sum of 1.7 and 1: 2.7
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$

PRACTICAL 5

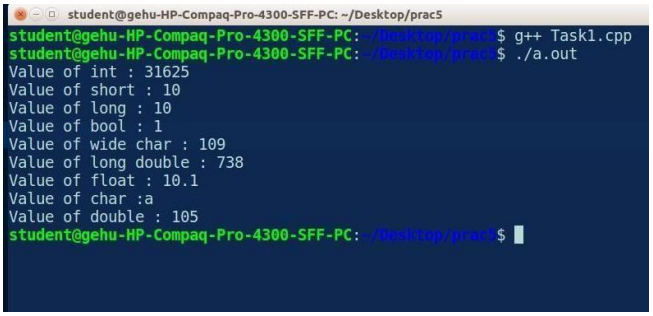
5.1

Source code :-

```
#include<iostream>
using namespace std;
void boolfun()
{
bool b = 1;
cout<<"Value of bool : "<<b<<endl;
}
void intfun()
{
int a =31625;
cout<<"Value of int : "<<a<<endl;
}
void shortfun()
{
short s =10;
cout<<"Value of short : "<<s<<endl;
}
void charfun()
{
char ch = 'a';
cout<<"Value of char :"<<ch<<endl;
}
void floatfun()
{
float f =10.1f;
cout<<"Value of float : "<<f<<endl;
}
void longfun()
{
long l =10;
cout<<"Value of long : "<<l<<endl;
}
void doublefun()
{
double d =105;
cout<<"Value of double : "<<d<<endl;
}
void ldoublefun()
{
```

```
long double ld  = 738l;
cout<<"Value of long double : "<<ld<<endl;
}
void wcharfun()
{
wchar_t wch = L'm';
cout<<"Value of wide char : "<<wch<<endl;
}

int main()
{
intfun();
shortfun();
longfun();
boolfun();
wcharfun();
ldoublefun();
floatfun();
charfun();
doublefun();
return 0;
}
```

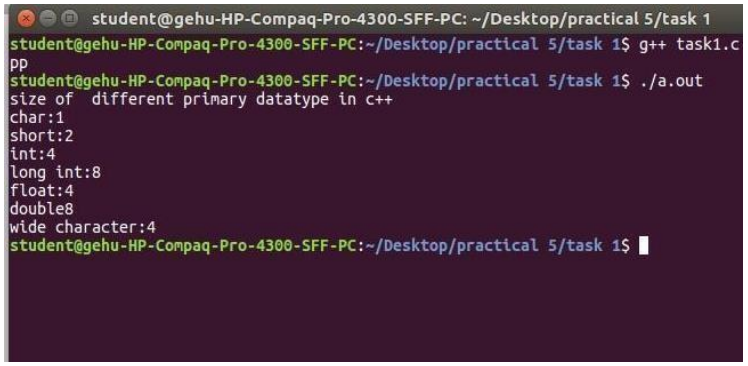
OUTPUT:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/prac5
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/prac5$ g++ Task1.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/prac5$ ./a.out
Value of int : 31625
Value of short : 10
Value of long : 10
Value of bool : 1
Value of wide char : 109
Value of long double : 738
Value of float : 10.1
Value of char :a
Value of double : 105
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/prac5$

5.2
Source Code:-

```
#include<iostream>
using namespace std;
int main()
{

cout<<"size of  different primary datatype in c++"<<endl;

cout<<"char:"<<sizeof(char)<<endl;
 cout<<"short:"<<sizeof(short)<<endl;
 cout<<"int:"<<sizeof(int)<<endl;
 cout<<"long int:"<<sizeof(long int)<<endl;
 cout<<"float:"<<sizeof(float)<<endl;
 cout<<"double"<<sizeof(double)<<endl;
 cout<<"wide character:"<<sizeof(wchar_t)<<endl;
 return 0;
}
```

OUTPUT:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/practical 5/task 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/practical 5/task 1$ g++ task1.c
pp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/practical 5/task 1$ ./a.out
size of different primary datatype in c++
char:1
short:2
int:4
long int:8
float:4
double8
wide character:4
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/practical 5/task 1$

PRACTICAL 6

6.1

Source code:-

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

int main()
{
int a=5,b=6;
float c=1.2,d = 2.2;
string s1= "abc",s2="def";


cout<<"Int + Int = "<<a+b<<endl;
cout<<"Float + Float = "<<c+d<<endl;
cout<<"String + String = "<<s1+s2<<endl;
cout<<"Int + Float = "<<a+c<<endl;
//cout<<"String + Int = "<<s1+a<<endl;
return 0;
}
```

OUTPUT:-

```
student@lab: ~/Desktop/Prac6/practical_06_task1                    10:17 AM
                 from /usr/include/c++/5/ios:42,
                 from /usr/include/c++/5/ostream:38,
                 from /usr/include/c++/5/iostream:39,
                 from practical_06_task1.cpp:1:
/usr/include/c++/5/bits/basic_string.tcc:1167:5: note: candidate: template<class _CharT, class _Traits, class _Alloc> std::__cxx11::b
asic_string<_CharT, _Traits, _Alloc> std::operator+(_CharT, const std::__cxx11::basic_string<_CharT, _Traits, _Alloc>&)
     operator+(_CharT __lhs, const basic_string<_CharT, _Traits, _Alloc>& __rhs)
     ^
/usr/include/c++/5/bits/basic_string.tcc:1167:5: note:   template argument deduction/substitution failed:
practical_06_task1.cpp:16:29: note:   mismatched types ‘const std::__cxx11::basic_string<_CharT, _Traits, _Alloc>’ and ‘int’
 cout<<"String + Int = "<<s1+a<<endl;
                         ^
In file included from /usr/include/c++/5/string:52:0,
                 from /usr/include/c++/5/bits/locale_classes.h:40,
                 from /usr/include/c++/5/bits/ios_base.h:41,
                 from /usr/include/c++/5/ios:42,
                 from /usr/include/c++/5/ostream:38,
                 from /usr/include/c++/5/iostream:39,
                 from practical_06_task1.cpp:1:
/usr/include/c++/5/bits/basic_string.h:4820:5: note: candidate: template<class _CharT, class _Traits, class _Alloc> std::__cxx11::bas
ic_string<_CharT, _Traits, _Alloc> std::operator+(const std::__cxx11::basic_string<_CharT, _Traits, _Alloc>&, const _CharT*)
     operator+(const basic_string<_CharT, _Traits, _Alloc>& __lhs,
     ^
/usr/include/c++/5/bits/basic_string.h:4820:5: note:   template argument deduction/substitution failed:
practical_06_task1.cpp:16:29: note:   mismatched types ‘const _CharT*’ and ‘int’
 cout<<"String + Int = "<<s1+a<<endl;
                         ^
In file included from /usr/include/c++/5/string:52:0,
                 from /usr/include/c++/5/bits/locale_classes.h:40,
                 from /usr/include/c++/5/bits/ios_base.h:41,
                 from /usr/include/c++/5/ios:42,
                 from /usr/include/c++/5/ostream:38,
                 from /usr/include/c++/5/iostream:39,
                 from practical_06_task1.cpp:1:
/usr/include/c++/5/bits/basic_string.h:4836:5: note: candidate: template<class _CharT, class _Traits, class _Alloc> std::__cxx11::bas
ic_string<_CharT, _Traits, _Alloc> std::operator+(const std::__cxx11::basic_string<_CharT, _Traits, _Alloc>&, _CharT)
     operator+(const basic_string<_CharT, _Traits, _Alloc>& __lhs, _CharT __rhs)
     ^
/usr/include/c++/5/bits/basic_string.h:4836:5: note:   template argument deduction/substitution failed:
practical_06_task1.cpp:16:29: note:   deduced conflicting types for parameter ‘_CharT’ (‘char’ and ‘int’)
 cout<<"String + Int = "<<s1+a<<endl;
                         ^
In file included from /usr/include/c++/5/bits/stl_algobase.h:67:0,
                 from /usr/include/c++/5/bits/char_traits.h:39,
                 from /usr/include/c++/5/ios:40,
                 from /usr/include/c++/5/ostream:38,
                 from /usr/include/c++/5/iostream:39,
                 from practical_06_task1.cpp:1:
/usr/include/c++/5/bits/stl_iterator.h:930:5: note: candidate: template<class _Iterator, class _Container> __gnu_cxx::__normal_iterat
or<_Iterator, _Container> __gnu_cxx::operator+(typename __gnu_cxx::__normal_iterator<_Iterator, _Container>::difference_type, const _
_gnu_cxx::__normal_iterator<_Iterator, _Container>&)
     operator+(typename __normal_iterator<_Iterator, _Container>::difference_typ
     ^
/usr/include/c++/5/bits/stl_iterator.h:930:5: note:   template argument deduction/substitution failed:
practical_06_task1.cpp:16:29: note:   mismatched types ‘const __gnu_cxx::__normal_iterator<_Iterator, _Container>’ and ‘int’
 cout<<"String + Int = "<<s1+a<<endl;
                         ^
student@lab:~/Desktop/Prac6/practical_06_task1$
```

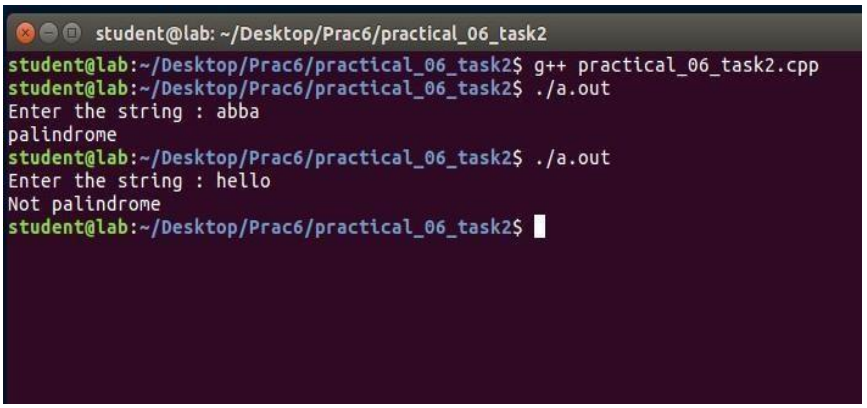
```
student@lab: ~/Desktop/Prac6/practical_06_task1
student@lab:~/Desktop/Prac6/practical_06_task1$ g++ practical_06_task1.cpp
student@lab:~/Desktop/Prac6/practical_06_task1$ ./a.out
Int + Int = 11
Float + Float = 3.4
String + String = abcdef
Int + Float = 6.2
student@lab:~/Desktop/Prac6/practical_06_task1$
```

6.2

Source code:-

```
#include<iostream>
#include<string.h>
#define  MAX 10
using namespace std;

int main()
{
int i,j,f=0;
string str;
cout<<"Enter the string : ";
getline(cin,str);

for(i=0,j=str.length()-1;i<j;i++,j--)
{
if(str[i] != str[j])
{
f=1;
break;
}
}

(f==0)?cout<<"palindrome\n":cout<<"Not palindrome\n";

return 0;
}
```

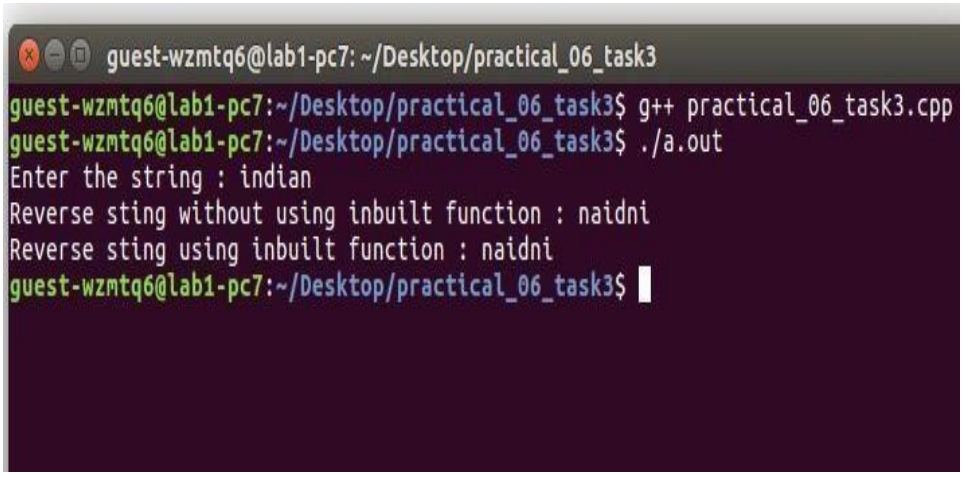
OUTPUT:-


student@lab: ~/Desktop/Prac6/practical_06_task2
student@lab:~/Desktop/Prac6/practical_06_task2$ g++ practical_06_task2.cpp
student@lab:~/Desktop/Prac6/practical_06_task2$ ./a.out
Enter the string : abba
palindrome
student@lab:~/Desktop/Prac6/practical_06_task2$ ./a.out
Enter the string : hello
Not palindrome
student@lab:~/Desktop/Prac6/practical_06_task2$

6.3
Source code :-

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

int main()
{
string str;
string b,c="";
cout<<"Enter the string : ";
getline(cin,str);

for(string::iterator i = str.end();i>=str.begin();i--)
{
c+=*i;
}

cout<<"Reverse sting without using inbuilt function : "<<c<<endl;
reverse(str.begin(),str.end());
cout<<"Reverse sting using inbuilt function : "<<str<<endl;

return 0;

}
```

OUTPUT:-

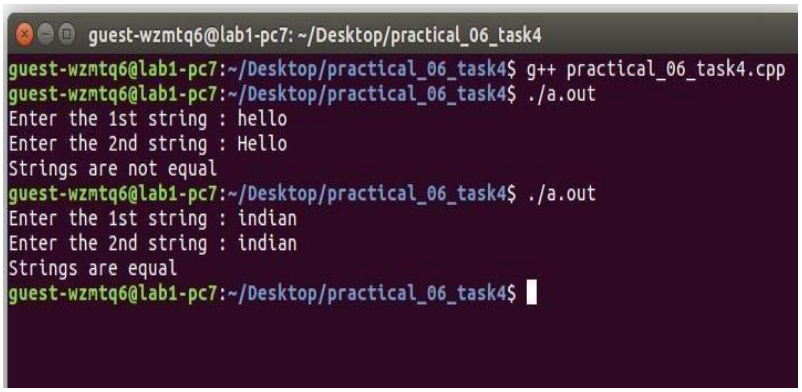

guest-wzmtq6@lab1-pc7: ~/Desktop/practical_06_task3
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task3$ g++ practical_06_task3.cpp
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task3$ ./a.out
Enter the string : indian
Reverse sting without using inbuilt function : naidni
Reverse sting using inbuilt function : naidni
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task3$

6.4

Source code :-

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

int main()
{
string a,b;
cout<<"Enter the 1st string : ";
getline(cin,a);
cout<<"Enter the 2nd string : ";
getline(cin,b);

int  s1,s2,f=1;
s1 = a.size() -1;
s2 = b.size() -1;

if(s1!=s2)
{
cout<<"Strings are not equal\n";
}
else
{
for(int i=0;i<=s1;i++)
{
if(a[i]!=b[i])
{
f=0;
break;
}
}
(f==0)?cout<<"Strings are not equal\n":cout<<"Strings are equal\n";
}
return 0;
}
```

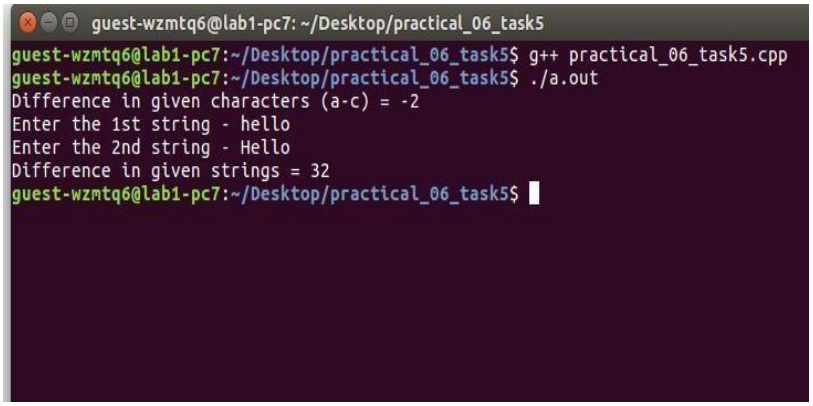
OUTPUT:-


guest-wzmtq6@lab1-pc7: ~/Desktop/practical_06_task4
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task4$ g++ practical_06_task4.cpp
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task4$ ./a.out
Enter the 1st string : hello
Enter the 2nd string : Hello
Strings are not equal
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task4$ ./a.out
Enter the 1st string : indian
Enter the 2nd string : indian
Strings are equal
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task4$

6.5
Source code:-

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

int main()
{
cout<<"Difference in given characters (a-c) = "<<(int)('a'-'c')<<endl;

string a,b;
cout<<"Enter the 1st string - ";
getline(cin,a);
cout<<"Enter the 2nd string - ";
getline(cin,b);

int x = a.compare(b);
cout<<"Difference in given strings = "<<x<<endl;

return 0;
}
```

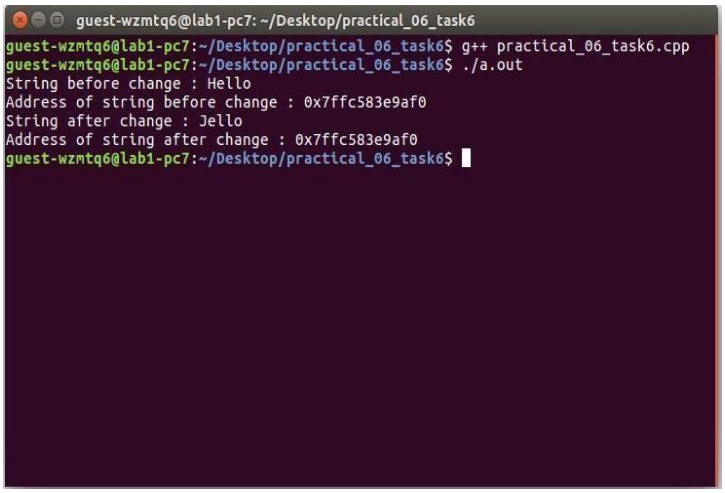
OUTPUT:-


guest-wzmtq6@lab1-pc7: ~/Desktop/practical_06_task5
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task5$ g++ practical_06_task5.cpp
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task5$ ./a.out
Difference in given characters (a-c) = -2
Enter the 1st string - hello
Enter the 2nd string - Hello
Difference in given strings = 32
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task5$

6.6
Source code:-

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

int main()
{
string str = "Hello";
cout<<"String before change : "<<str<<endl;
cout<<"Address of string before change : "<<&str<<endl;

str[0] = 'J';

cout<<"String after change : "<<str<<endl;
cout<<"Address of string after change : "<<&str<<endl;

return 0;

}
```

OUTPUT:-


guest-wzmtq6@lab1-pc7: ~/Desktop/practical_06_task6
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task6$ g++ practical_06_task6.cpp
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task6$ ./a.out
String before change : Hello
Address of string before change : 0x7ffc583e9af0
String after change : Jello
Address of string after change : 0x7ffc583e9af0
guest-wzmtq6@lab1-pc7:~/Desktop/practical_06_task6$

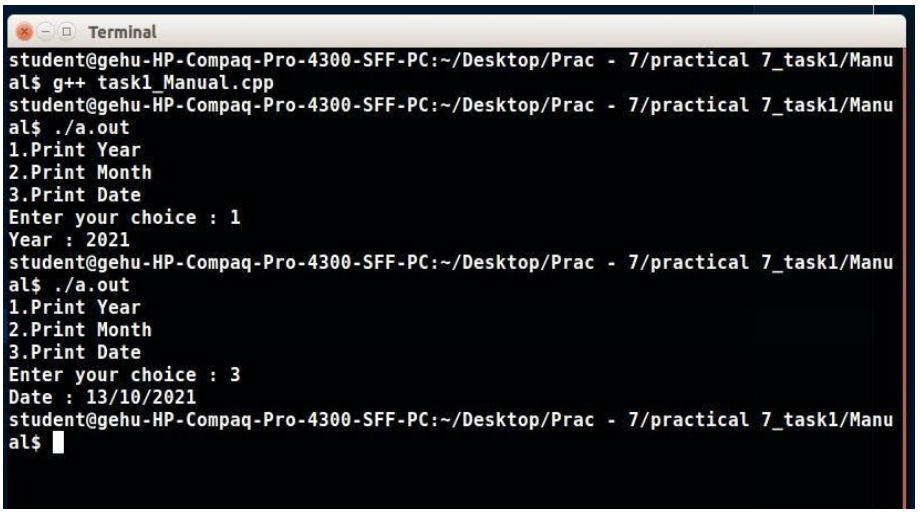
PRACTICAL 7

7.1

Source code:-

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

int main()
{
	int ch;
	cout<<"1.Print Year\n2.Print Month\n3.Print Date\nEnter your choice : ";
	cin>>ch;
	switch(ch)
	{
		case 1:cout<<"Year : 2021"<<endl;
		break;
		case 2:cout<<"Month : October"<<endl;
		break;
		case 3:cout<<"Date : 13/10/2021"<<endl;
		break;
		default: cout<<"Not Applicable "<<endl;
	}
	return 0;
}
```

OUTPUT:-

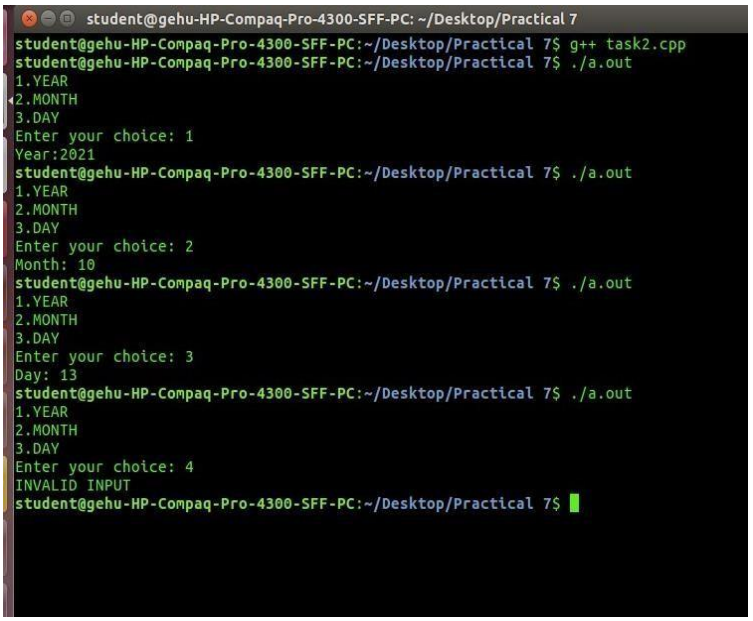

Terminal
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task1/Manu
al$ g++ task1_Manual.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task1/Manu
al$ ./a.out
1.Print Year
2.Print Month
3.Print Date
Enter your choice : 1
Year : 2021
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task1/Manu
al$ ./a.out
1.Print Year
2.Print Month
3.Print Date
Enter your choice : 3
Date : 13/10/2021
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task1/Manu
al$

7.2

Source code :-

```
#include <iostream>
#include <ctime>

using namespace std;

int main() {
   int choice;
   time_t now = time(0);

        cout<<"1.YEAR\n2.MONTH\n3.DAY\nEnter your choice: ";
        cin>>choice;

        tm *a = localtime(&now);

        switch(choice)
        {
                case 1:         cout << "Year:" << 1900 + a->tm_year<<endl;
                                break;
                case 2: cout << "Month: "<< 1 + a->tm_mon<< endl;
                                break;
                case 3:         cout << "Day: "<< a->tm_mday << endl;
                                break;
                default: cout<<"INVALID INPUT\n";
        }
}
```

OUTPUT:-

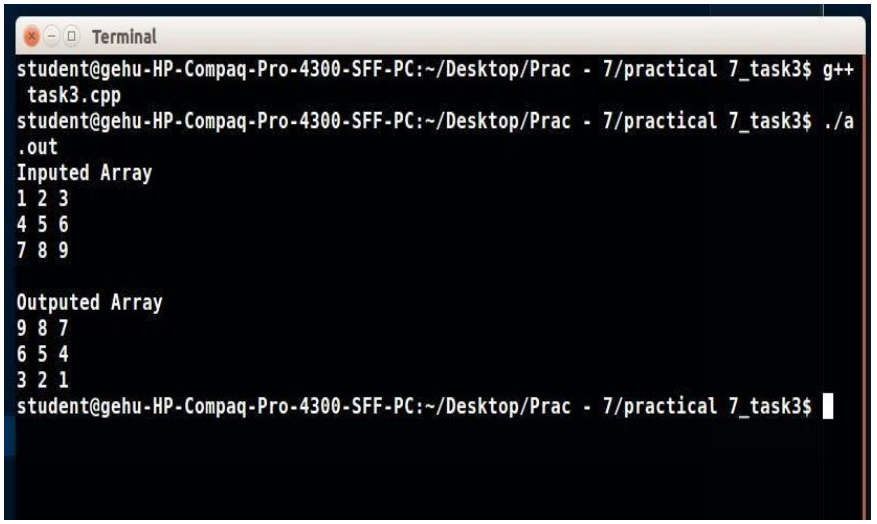

student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/Practical 7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ g++ task2.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
1.YEAR
2.MONTH
3.DAY
Enter your choice: 1
Year:2021
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
1.YEAR
2.MONTH
3.DAY
Enter your choice: 2
Month: 10
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
1.YEAR
2.MONTH
3.DAY
Enter your choice: 3
Day: 13
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
1.YEAR
2.MONTH
3.DAY
Enter your choice: 4
INVALID INPUT
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$

7.3(v1)

Source code:-

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

int main()
{
	int i,j;
	int count = 1,arr[3][3];
	cout<<"Inputed Array "<<endl;
	for(i=0;i<3;i++)
	{	for(j=0;j<3;j++)
		{	arr[i][j] = count++;
			cout<<arr[i][j]<<" ";
		}
		cout<<"\n";
	}
	cout<<"\nOutputed Array "<<endl;
	for(i=2;i>=0;i--)
	{	for(j=2;j>=0;j--)
		{
			cout<<arr[i][j]<<" ";
		}
		cout<<"\n";
	}
	return 0;
}
```

OUTPUT:-

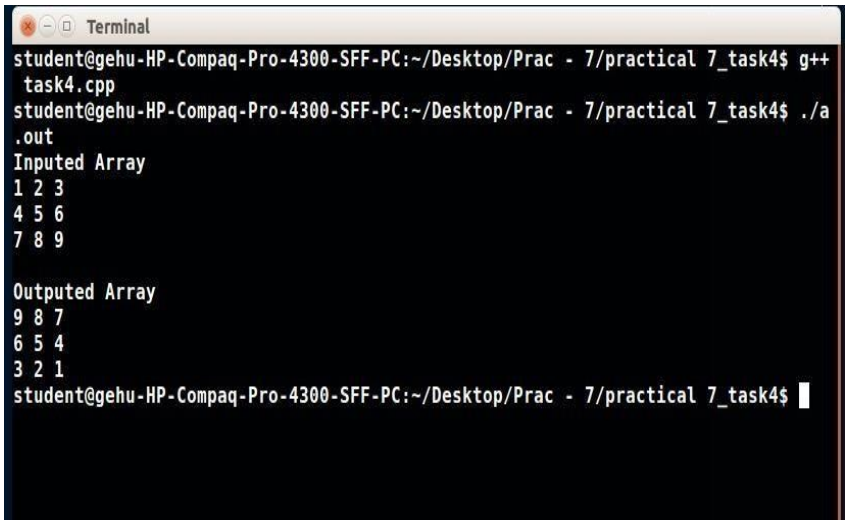

Terminal
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task3$ g++
task3.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task3$ ./a
.out
Inputed Array
1 2 3
4 5 6
7 8 9
Outputed Array
9 8 7
6 5 4
3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task3$

7.3(v2)

Source code:-

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

int main()
{
	int i,j;
	int count = 1,arr[3][3];
	cout<<"Inputed Array "<<endl;
	for(i=0;i<3;i++)
	{	for(j=0;j<3;j++)
		{	arr[i][j] = count++;
			cout<<arr[i][j]<<" ";
		}
		cout<<"\n";
	}
	cout<<"\nOutputed Array"<<endl;
	for(i=0;i<3;i++)
	{	for(j=0;j<3;j++)
		{
			cout<<10 - arr[i][j]<<" ";
		}
		cout<<"\n";
	}
	return 0;
}
```

OUTPUT:-


Terminal
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task4$ g++
task4.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task4$ ./a
.out
Inputed Array
1 2 3
4 5 6
7 8 9
Outputed Array
9 8 7
6 5 4
3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task4$

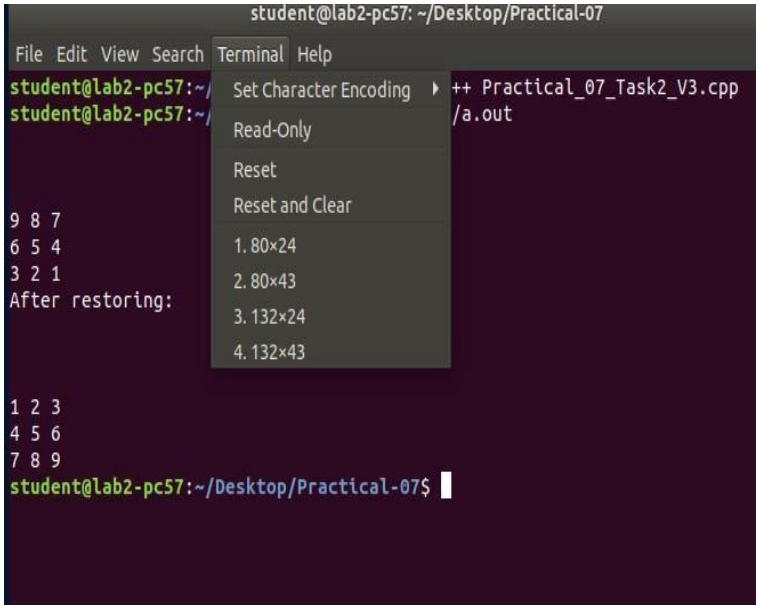
7.3 (v3)

Source code:-

```
#include<iostream>
#define MAX 3
using namespace std;
int main()
{
        int a[MAX][MAX],count=1;
        for(int i=0;i<MAX;i++)
        {
                for(int j=0;j<MAX;j++)
                {
                        a[i][j]=count;
                        count++;
                }
        }
        for(int i=0;i<MAX;i++)
        {
                for(int j=0;j<MAX;j++)
                {
                        a[i][j]=10-a[i][j];
                }
                cout<<"\n";
        }


        for(int i=0;i<MAX;i++)
        {
                for(int j=0;j<MAX;j++)
                {
                        cout<<a[i][j]<<" ";
                }
                cout<<"\n";
        }

        cout<<"After restoring: "<<endl;
    for(int i=0;i<MAX;i++)
        {
                for(int j=0;j<MAX;j++)
                {
                        a[i][j]=10-a[i][j];
                        cout<<arr[i][j];

                }
                cout<<"\n";
        }
```

```
}
```

Output:-

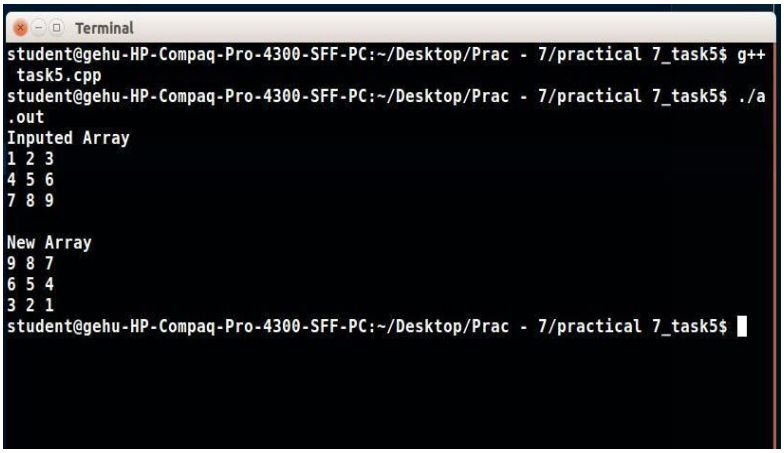

student@lab2-pc57: ~/Desktop/Practical-07
File Edit View Search Terminal Help
Set Character Encoding
Read-Only
Reset
Reset and Clear
1. 80×24
2. 80×43
3. 132×24
4. 132×43
++ Practical_07_Task2_V3.cpp
/a.out
9 8 7
6 5 4
3 2 1
After restoring:
1 2 3
4 5 6
7 8 9
student@lab2-pc57:~/Desktop/Practical-07$

7.3(v4)

Source code:-

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

int main()
{
	int i,j;
	int count = 1,arr[3][3];
	cout<<"Inputed Array "<<endl;
	for(i=0;i<3;i++)
	{	for(j=0;j<3;j++)
		{	arr[i][j] = count++;
			cout<<arr[i][j]<<" ";
		}
		cout<<"\n";
	}
	cout<<"\nOutputed Array"<<endl;
	for(i=0;i<3;i++)
	{	for(j=0;j<3;j++)
		{
			cout<<10 - arr[i][j]<<" ";
		}
		cout<<"\n";
	}
	return 0;
}
```

OUTPUT:-


Terminal
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task5$ g++
task5.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task5$ ./a
.out
Inputed Array
1 2 3
4 5 6
7 8 9
New Array
9 8 7
6 5 4
3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Prac - 7/practical 7_task5$

7.4(v1)

Source code:-

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

int main()
{
	int a[3][3]={{1,2,3},{4,5,6},{7,8,9}};

	cout<<"Matrix before conversion\n";
	for(int i=0;i<3;i++)
	{
		for(int j=0;j<3;j++)
			cout<<a[i][j]<<" ";

		cout<<"\n";
	}

	cout<<"\nMatrix after conversion\n";
	for(int i=0;i<3;i++)
	{
		for(int j=0;j<3;j++)
			cout<<i+1<<" ";

		cout<<"\n";
	}
return 0;
}
```

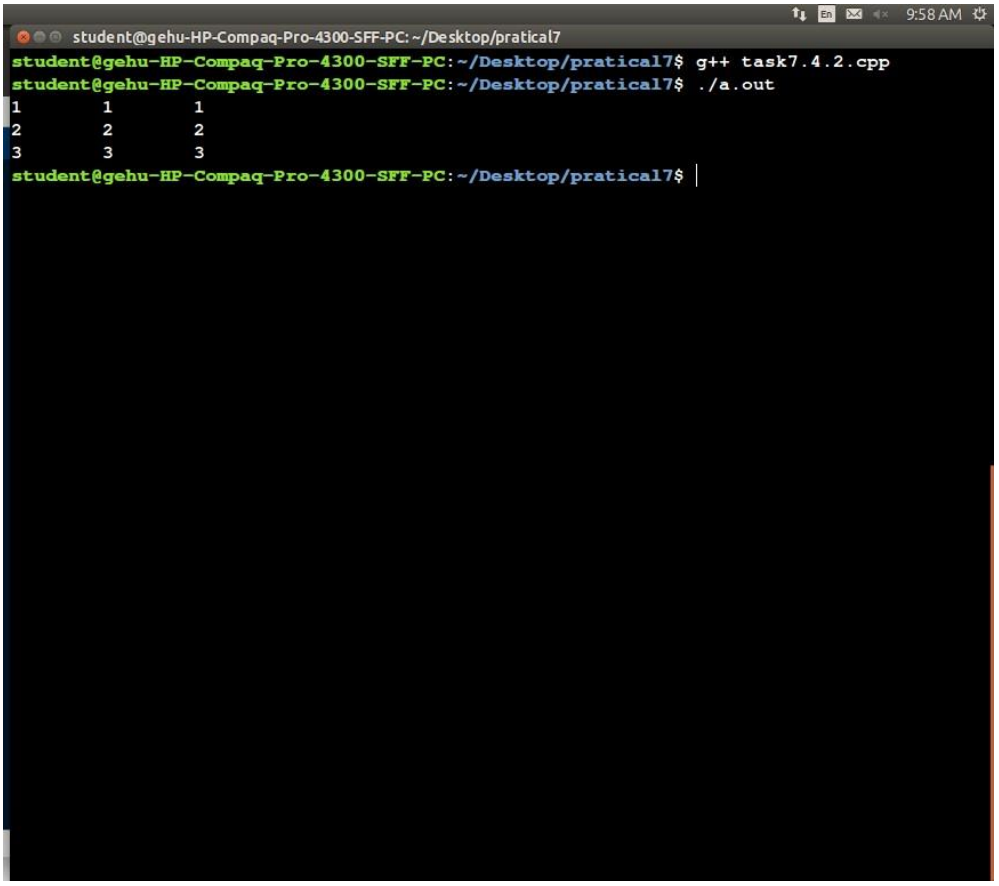
OUTPUT:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/Practical 7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ g++ task
a.out
Matrix before conversion
1 2 3
4 5 6
7 8 9
Matrix after conversion
1 1 1
2 2 2
3 3 3
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$

7.4(v2)
Source code :

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

int main()
{
int a[3][3]={1,2,3,4,5,6,7,8,9};
for(int i=0;i<3;i++)
{
for(int j=0;j<3;j++)
{
cout<<a[i][2]/3<<"\t";
}
cout<<"\n";
}
return 0;
}
```

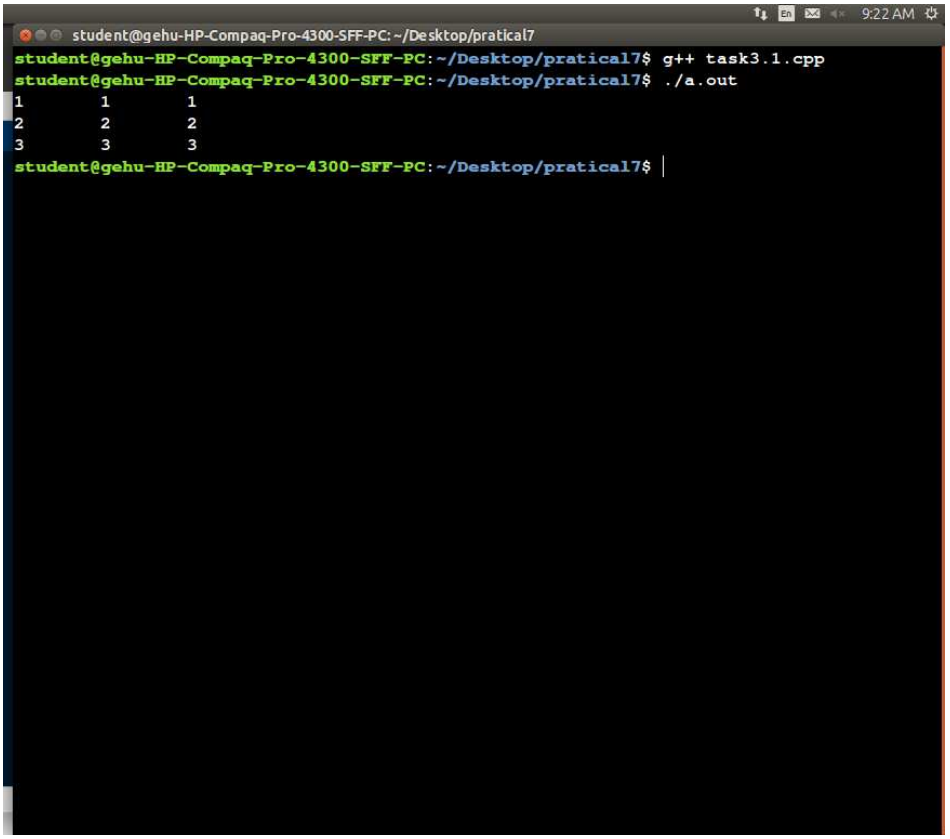
Output


9:58 AM
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/pratical7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/pratical7$ g++ task7.4.2.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/pratical7$ ./a.out
1 1 1
2 2 2
3 3 3
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/pratical7$

7.4(v3)
Source code :

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

int main()
{
int a[3][3]={1,2,3,4,5,6,7,8,9};
for(int i=0;i<3;i++)
{
for(int j=0;j<3;j++)
{
a[i][j]=a[i][j]-(2*i+j);
cout<<a[i][j]<<"\t";
}
cout<<"\n";
}
return 0;
}
```

Output

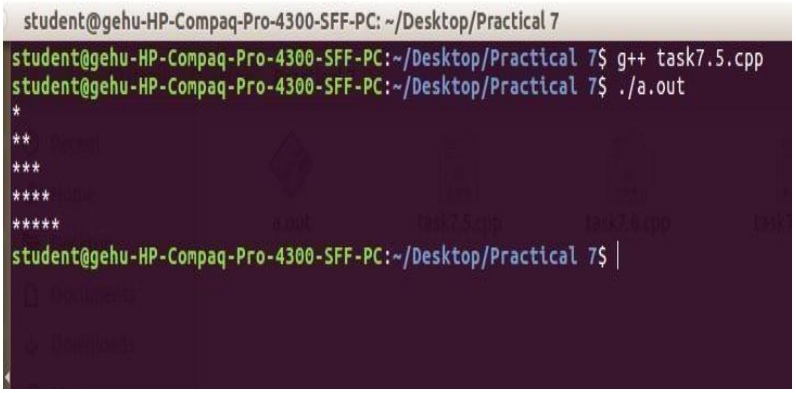

9:22 AM
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/pratical7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/pratical7$ g++ task3.1.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/pratical7$ ./a.out
1 1 1
2 2 2
3 3 3
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/pratical7$

7.5

Source code:-

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

int main()
{
	int j;
	for(int i=0;i<5;i++)
	{
		for(int j=0;j<=i;j++)
			cout<<"*";
		cout<<"\n";
	}

return 0;
}
```

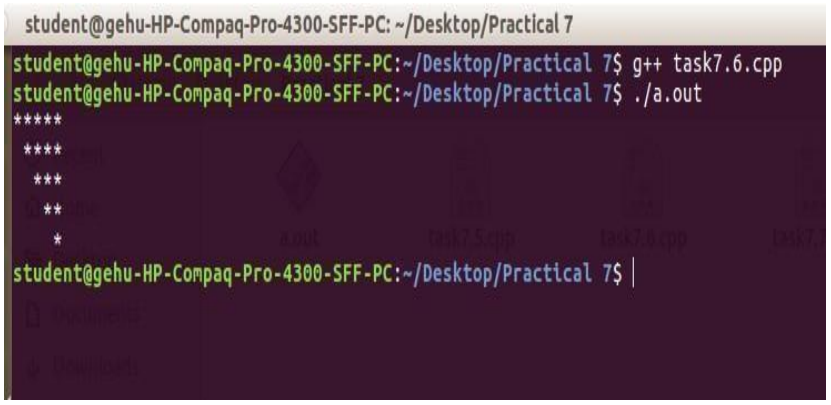
OUTPUT:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/Practical 7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ g++ task7.5.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
*
**
***
****
*****
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$

7.6
Source code:-

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

int main()
{
	for(int i=0;i<5;i++)
	{
		int c=i;
		while(c!=0)
		{
			cout<<" ";
			c--;
		}

		for(int j=i;j<5;j++)
		{
			cout<<"*";
		}

		cout<<"\n";
	}

return 0;
}
```

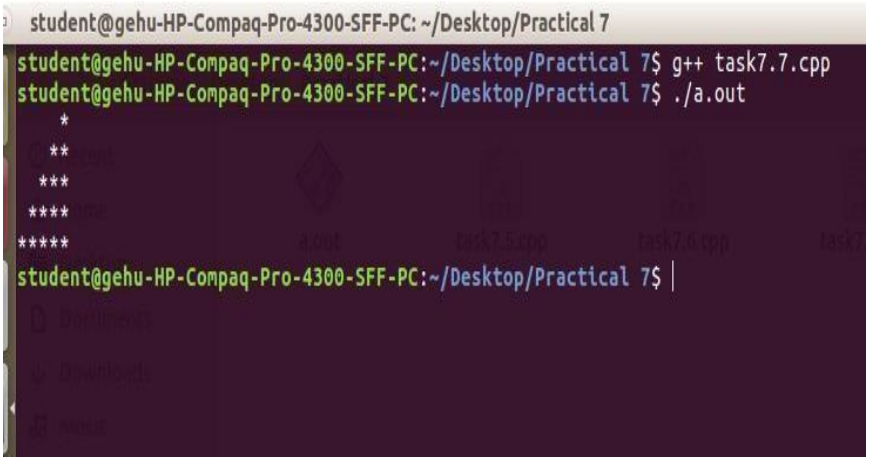
OUTPUT:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/Practical 7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ g++ task7.6.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
*****
****
***
**
*
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$

7.7
Source code :-

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

int main()
{
	int count =0,c;
	for(int i=5;i>0;i--)
	{
		++count;
		for(int j=1;j<i;j++)
			cout<<" ";

		c=count;
		while(c!=0)
		{
			cout<<"*";
			c--;
		}
		cout<<"\n";
	}

return 0;
}
```

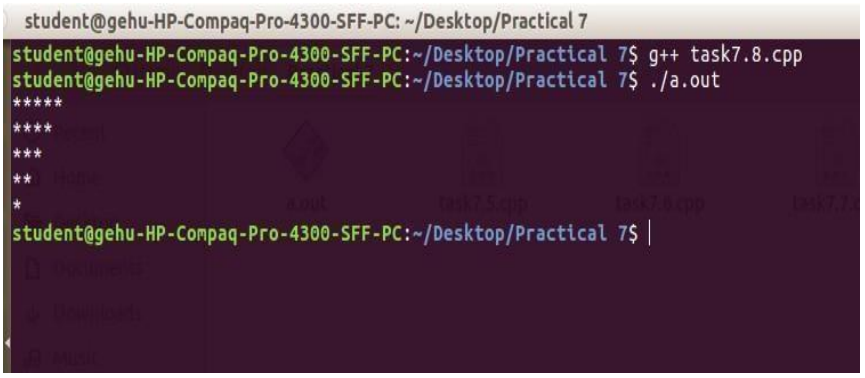
Output:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/Practical 7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ g++ task7.7.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
*
**
***
****
*****
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$

7.8
Source code:-

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

int main()
{
	for(int i=5;i>0;i--)
	{
		for(int j=1;j<=i;j++)
		cout<<"*";

		cout<<endl;
	}

return 0;
}
```

OUTPUT:-


student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/Practical 7
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ g++ task7.8.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$ ./a.out
*****
****
***
**
*
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/Practical 7$

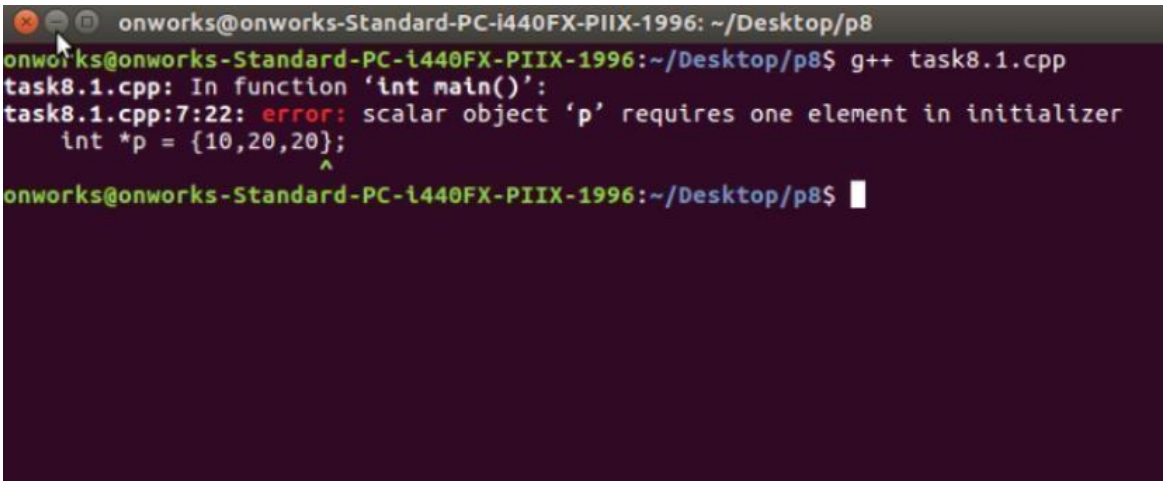
PRACTICAL 8

8.1

Source code:-

```
#include <iostream>
using namespace std;
// Q -Will the program through an error and if yes then why?
// A -The program will give us an error because the pointer variable is basically
used to store the address of another variable
//    of same data type.
int main()
{
   int *p = {10,20,20};

    cout << *p;

    p++;

    cout << *p;
    return 0;
}
```

Output:-

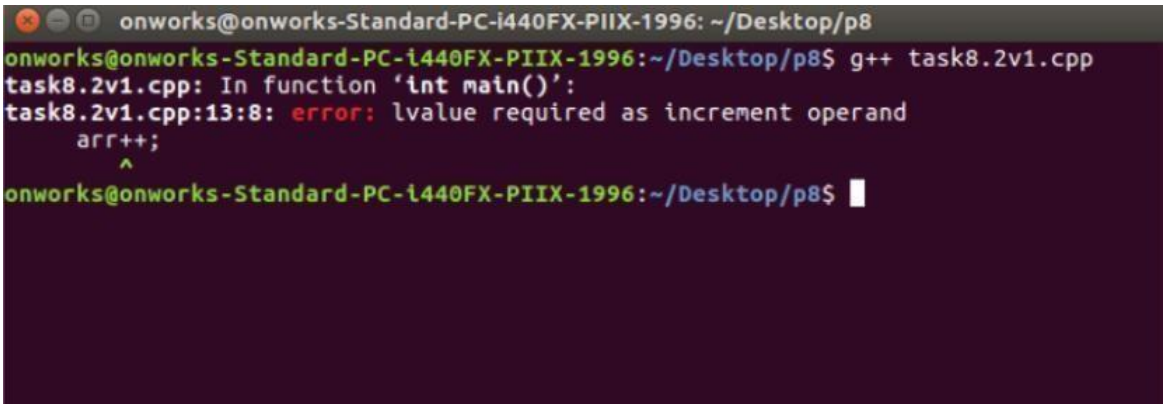

onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/p8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ g++ task8.1.cpp
task8.1.cpp: In function 'int main()':
task8.1.cpp:7:22: error: scalar object 'p' requires one element in initializer
int *p = {10,20,20};
^
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$

8.2(v1)

Source code :-

```
#include <iostream>
using namespace std;
//8.2 v1

int main()
{
   int arr[] = {10,20,30};

    cout << *arr;

    cout << arr;

    arr++;

    cout << *arr;
    return 0;
}
```

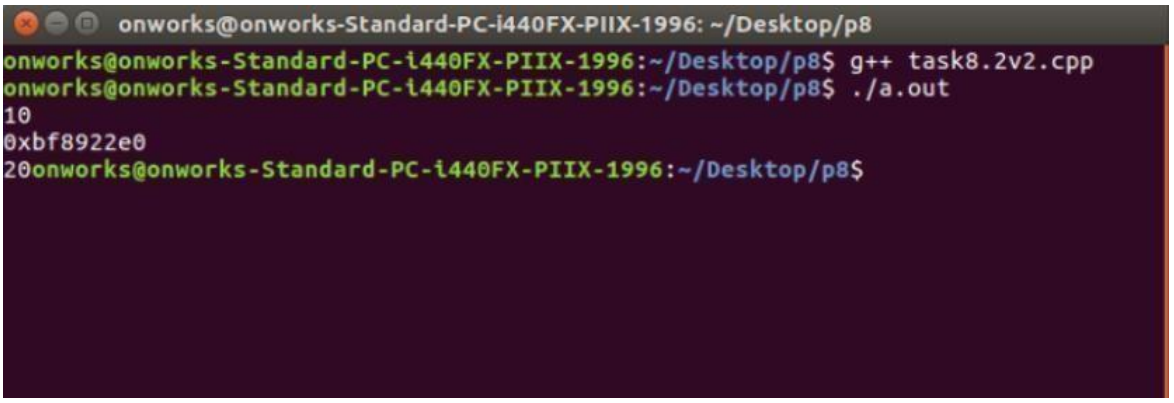
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/p8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ g++ task8.2v1.cpp
task8.2v1.cpp: In function 'int main()':
task8.2v1.cpp:13:8: error: lvalue required as increment operand
arr++;
^
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$

8.2(v2)
Source code :-

```
#include <iostream>
using namespace std;
//8.2 v2

int main()
{
   int arr[] = {10,20,30};

   cout << *arr;

   cout <<endl<< arr;

   cout <<endl<< *(arr+1);
   return 0;
}
```

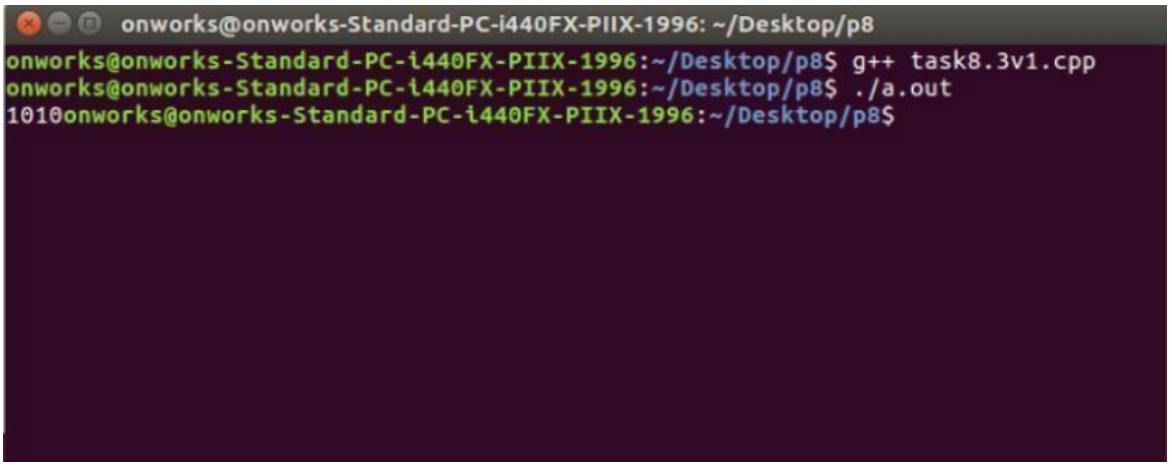
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/p8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ g++ task8.2v2.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ ./a.out
10
0xbf8922e0
20onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$

8.3(v1)
Source code:-

```
#include <iostream>
using namespace std;
//8.3 v1

int main()
{
   int a = 10;

   int *p;

   int  **q;

   p = &a;

   q = &p;

   cout << *p;

   cout << **q;
   return 0;
}
```

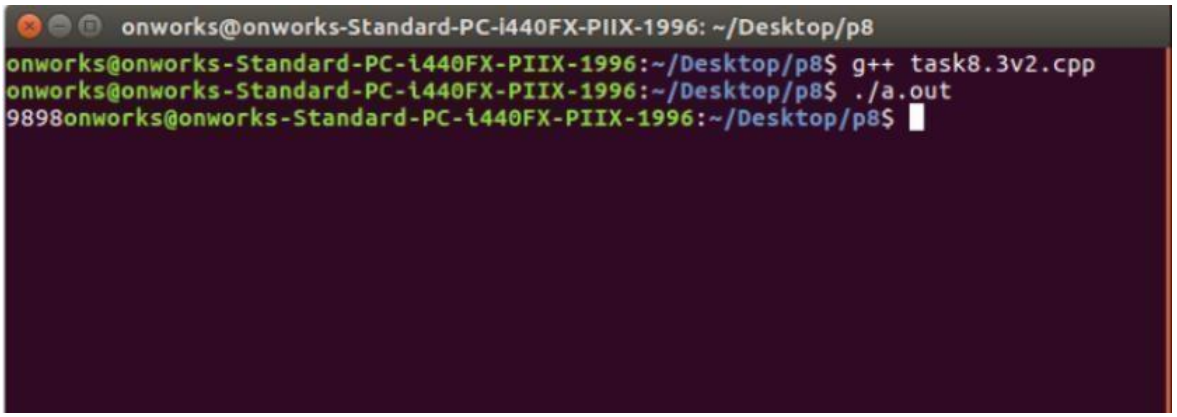
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/p8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ g++ task8.3v1.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ ./a.out
1010onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$

8.3(v2)
Source code:-

```
#include <iostream>
using namespace std;
//8.3 v2

int main()
{
   int a = 10;

   int *p;

   int  **q;

   p = &a;

   q = &p;

   **q=98;

   cout << *p;

   cout << **q;
   return 0;
}
```

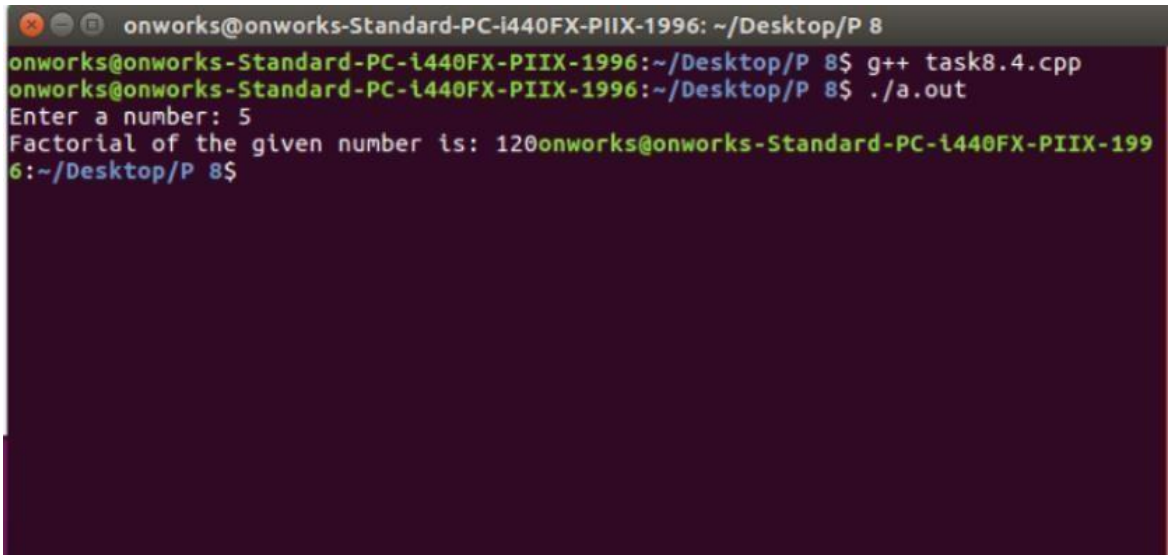
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/p8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ g++ task8.3v2.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$ ./a.out
9898onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/p8$

8.4
Source code:-

```
#include <iostream>
using namespace std;
//8.4
long  fact (int n)
{
   int p=1;
   while(n!=0)
   {
      p=p*n;
      --n;
   }
   return p;
}
int main()
{
   int n;
   cout<<"Enter a number: ";
   cin>>n;

   cout<<"Factorial of the given number is: "<<fact(n);

return 0;
}
```

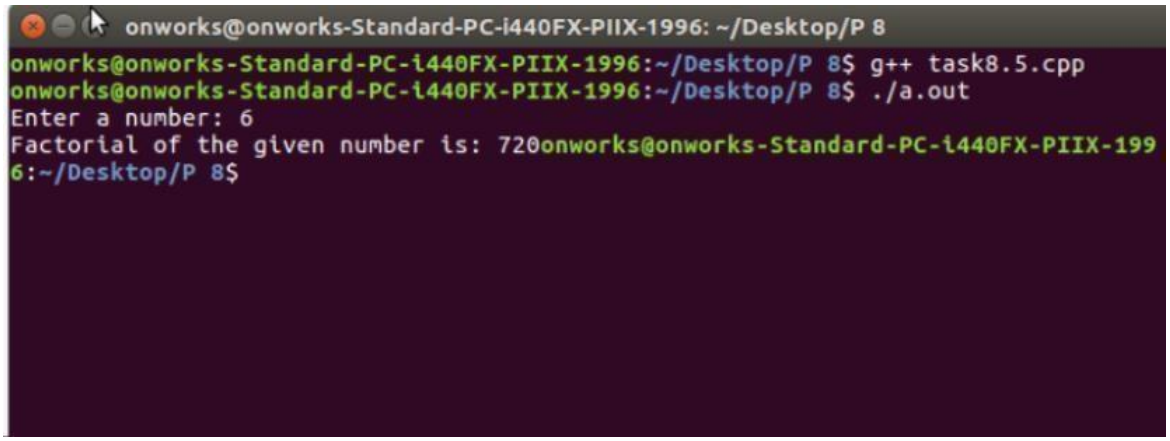
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/P 8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ g++ task8.4.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ ./a.out
Enter a number: 5
Factorial of the given number is: 120onworks@onworks-Standard-PC-i440FX-PIIX-199
6:~/Desktop/P 8$

8.5
Source code :-

```
#include <iostream>
using namespace std;
//8.5
long  fact (int n)
{
   if(n==1)
      return 1;
   else
      return(n*fact(n-1));
}
int main()
{
   int n;
   cout<<"Enter a number: ";
   cin>>n;

   cout<<"Factorial of the given number is: "<<fact(n);

return 0;
}
```

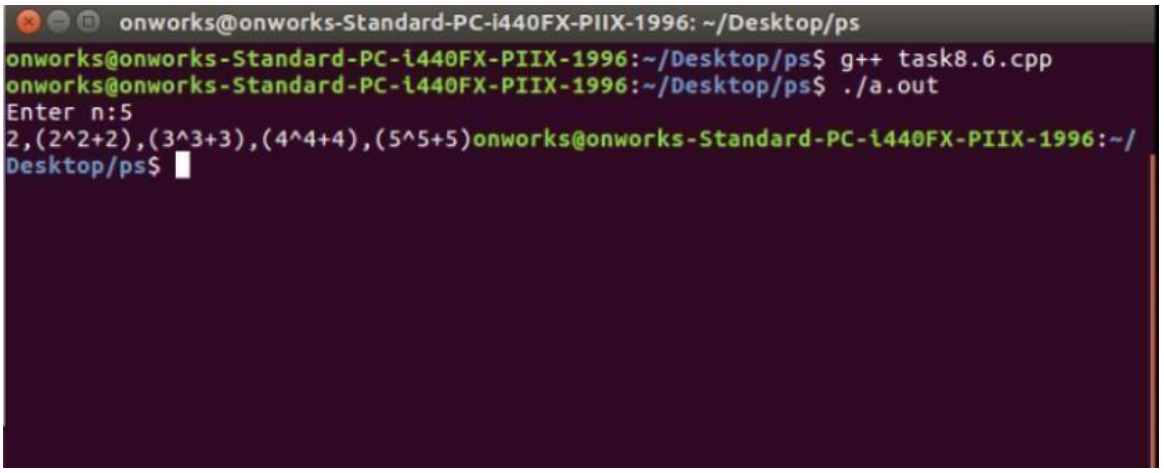
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/P 8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ g++ task8.5.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ ./a.out
Enter a number: 6
Factorial of the given number is: 720onworks@onworks-Standard-PC-i440FX-PIIX-199
6:~/Desktop/P 8$

8.6
Source code:-

```
#include<iostream>
using namespace std;
//8.6

void series(int n)
{

if(n==1)
{
 cout<<"2";
    return;
}
else
    series(n-1);

cout<<",("<<n<<"^"<<n<<"+"<<n<<")";
}


int main()
{ int n;
  cout<<"Enter n:";
  cin>>n;
  series(n);
   return 0;
}
```

Output:-

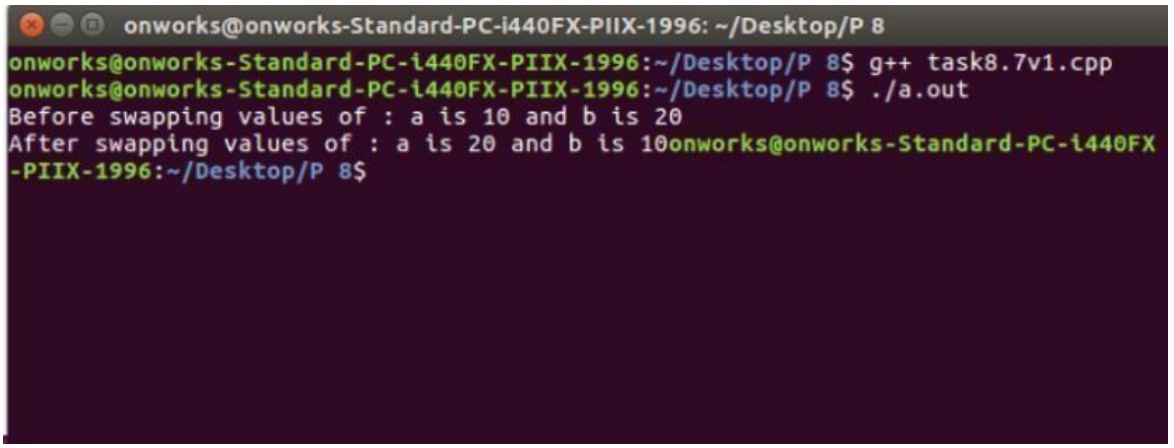

onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/ps
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/ps$ g++ task8.6.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/ps$ ./a.out
Enter n:5
2,(2^2+2),(3^3+3),(4^4+4),(5^5+5)onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/
Desktop/ps$

8.7 (v1)

Source code :-

```
#include <iostream>
using namespace std;
//8.7 v1
void swap(int a, int b)
{
   a=a+b;
   b=a-b;
   a=a-b;
   cout<<"\nAfter swapping values of : a is "<<a<<" and b is "<<b;
}

int main()
{
   int a=10;
   int b=20;
   cout<<"Before swapping values of : a is "<<a<<" and b is "<<b;
   swap(a,b);

return 0;
}
```

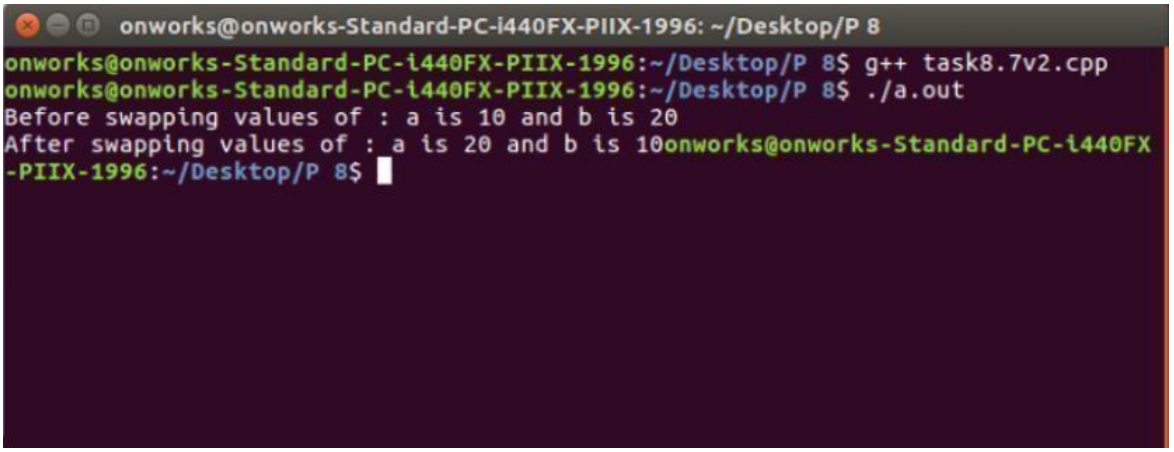
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/P 8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ g++ task8.7v1.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ ./a.out
Before swapping values of : a is 10 and b is 20
After swapping values of : a is 20 and b is 10onworks@onworks-Standard-PC-i440FX
-PIIX-1996:~/Desktop/P 8$

8.7 (v2)
Source code :-

```
#include <iostream>
using namespace std;
//8.7 v2
void swap(int &a, int &b)
{
   a=a+b;
   b=a-b;
   a=a-b;
   cout<<"\nAfter swapping values of : a is "<<a<<" and b is "<<b;
}

int main()
{
   int a=10;
   int b=20;
   cout<<"Before swapping values of : a is "<<a<<" and b is "<<b;
   swap(a,b);

return 0;
}
```

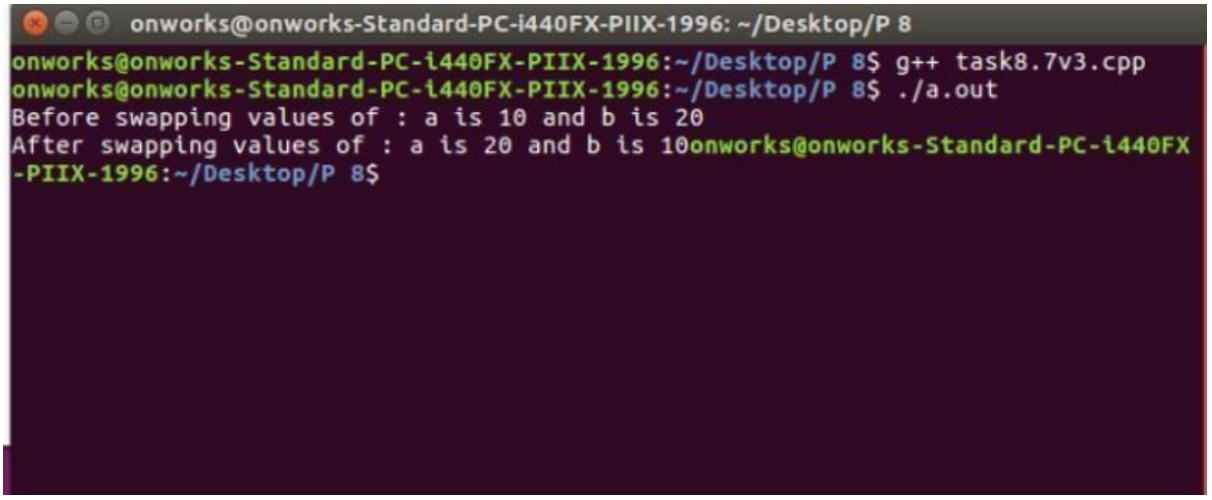
Output:-


onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/P 8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ g++ task8.7v2.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ ./a.out
Before swapping values of : a is 10 and b is 20
After swapping values of : a is 20 and b is 10onworks@onworks-Standard-PC-i440FX
-PIIX-1996:~/Desktop/P 8$

8.7 (v3)
Source code:-

```
#include <iostream>
using namespace std;
//8.7 v3
void swap(int *a, int *b)
{
   *a=*a+*b;
   *b=*a-*b;
   *a=*a-*b;
   cout<<"\nAfter swapping values of : a is "<<*a<<" and b is "<<*b;
}

int main()
{
   int a=10;
   int b=20;
   cout<<"Before swapping values of : a is "<<a<<" and b is "<<b;
   swap(&a,&b);

return 0;
}
```

Output:-

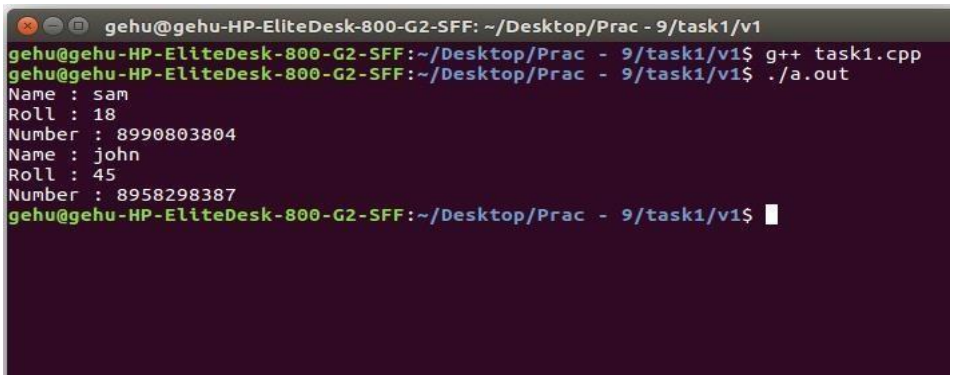

onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~/Desktop/P 8
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ g++ task8.7v3.cpp
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop/P 8$ ./a.out
Before swapping values of : a is 10 and b is 20
After swapping values of : a is 20 and b is 10onworks@onworks-Standard-PC-i440FX
-PIIX-1996:~/Desktop/P 8$

PRACTICAL 9

9.1
Source code :-

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

class student
{
string name;
long roll;
string num;

public:
        void assign(string x,long y,string z)
        {
                        name = x;
                        roll = y;
                        num = z;
        }
        void print()
        {
                        cout<<"Name : "<<name<<endl;
                        cout<<"Roll : "<<roll<<endl;
                        cout<<"Number : "<<num<<endl;
        }
};

int main()
{
student obj1,obj2;
obj1.assign("sam",18,"8990803804");
obj2.assign("john",45,"8958298387");
obj1.print();
obj2.print();
return 0;

}
```

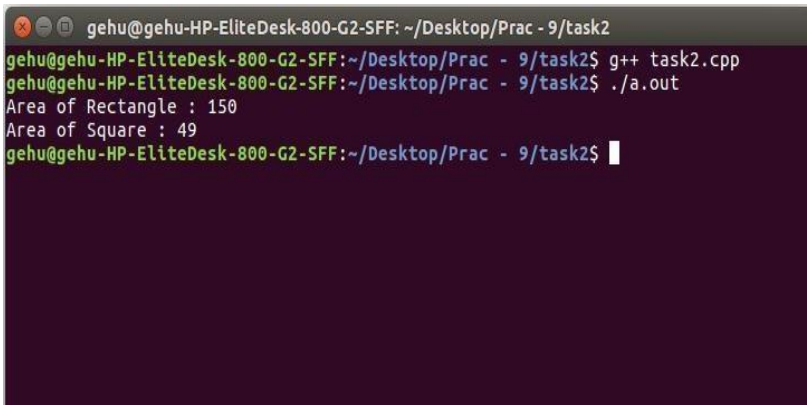
Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/Prac - 9/task1/v1
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task1/v1$ g++ task1.cpp
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task1/v1$ ./a.out
Name : sam
Roll : 18
Number : 8990803804
Name : john
Roll : 45
Number : 8958298387
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task1/v1$

9.2
Source code :-

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

class area
{
public:
	area(int l,int b)
	{
		cout<<"Area of Rectangle : "<<l*b<<endl;
	}

	area(int l)
	{
		cout<<"Area of Square : "<<l*l<<endl;
	}

};

int main()
{
	area x(10,15),y(7);
	return 0;
}
```

Output:-

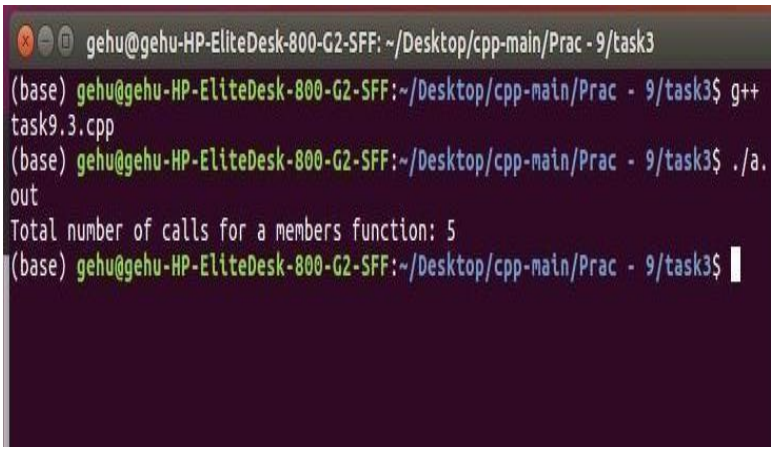

gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/Prac - 9/task2
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task2$ g++ task2.cpp
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task2$ ./a.out
Area of Rectangle : 150
Area of Square : 49
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task2$

9.3

Source code:-

```
#include<iostream>
using namespace std;
class Static{
   public:
      static int a;
      Static(int b){
         a++;
      }
};
int Static::a=0;
int main(){
   Static s1(98),s2(67),s3(50),s4(90),s5(20);
   cout<<"Total number of calls for a members function: "<<Static::a<<endl;
}
```

Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 9/task3
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 9/task3$ g++ task9.3.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 9/task3$ ./a.out
Total number of calls for a members function: 5
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 9/task3$

9.4
Source code:-

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

class student
{
string name;
int marks;

public:
        friend void add(student x);
        void assign()
        {
                cout<<"Enter the name : ";
                cin>>name;
                cout<<"Enter the Marks : ";
                cin>>marks;
        }
};

int t=0;
void add(student x)
{
        t+=x.marks;
}

int main()
{
student obj1,obj2,obj3;
obj1.assign();
obj2.assign();
obj3.assign();
add(obj1);
add(obj2);
add(obj3);

cout<<"Total Marks : "<<t<<endl;
return 0;

}
```

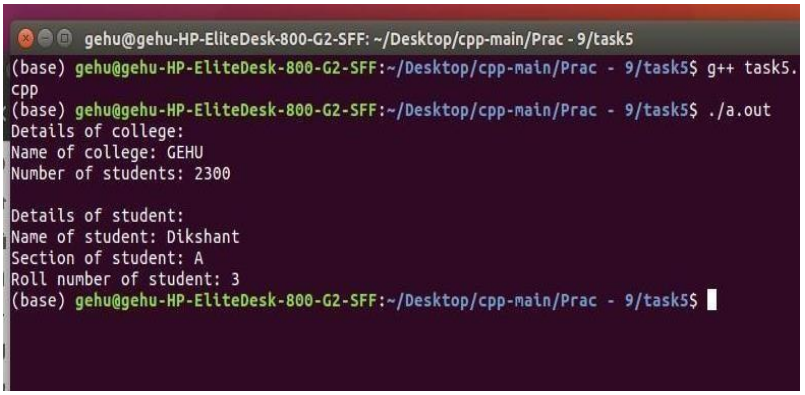
Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/Prac - 9/task4
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task4$ g++ task4.cpp
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task4$ ./a.out
Enter the name : demon
Enter the Marks : 56
Enter the name : enzo
Enter the Marks : 87
Enter the name : rick
Enter the Marks : 45
Total Marks : 188
gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/Prac - 9/task4$

9.5
Source code :-

```
#include<iostream>
using namespace std;
class College{
   int ns;
   string cname;
public:
   struct Student{
      string sname;
      char sec;
      int rn;
   }s1;
   College(int n,string s){
      ns=n;
      cname=s;
   }
   void print(){
      cout<<"Details of college:"<<endl;
      cout<<"Name of college: "<<cname<<endl;
      cout<<"Number of students: "<<ns<<endl<<endl;
      cout<<"Details of student:"<<endl;
      cout<<"Name of student: "<<s1.sname<<endl;
      cout<<"Section of student: "<<s1.sec<<endl;
      cout<<"Roll number of student: "<<s1.rn<<endl;
   }
};
int main(){
   College c1(2300,"GEHU");
   c1.s1.sname="Dikshant";
   c1.s1.sec='A';
   c1.s1.rn=3;
   c1.print();
}
```

Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 9/task5
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 9/task5$ g++ task5.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 9/task5$ ./a.out
Details of college:
Name of college: GEHU
Number of students: 2300
Details of student:
Name of student: Dikshant
Section of student: A
Roll number of student: 3
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 9/task5$

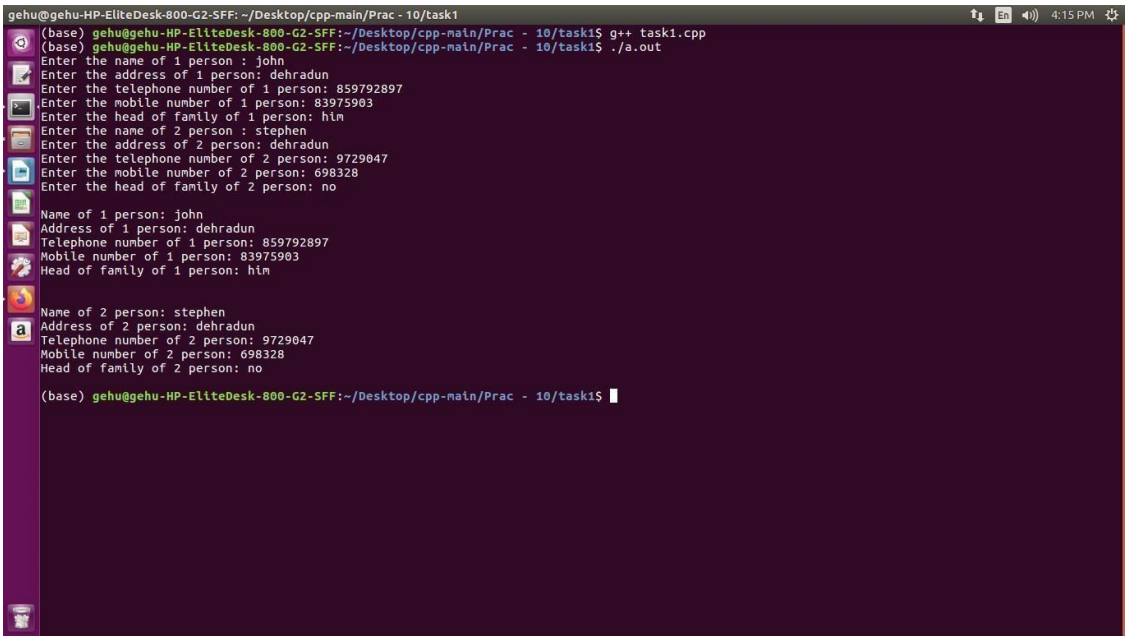
PRACTICAL 10

10.1

Source code :-

```
#include<iostream>
using namespace std;
class Person{
public:
   string name;
   string ad;
   long long tn;
   long long mn;
   string head;
   void print(int i){
      cout<<endl;
      cout<<"Name of "<<i<<" person: "<<name<<endl;
      cout<<"Address of "<<i<<" person: "<<ad<<endl;
      cout<<"Telephone number of "<<i<<" person: "<<tn<<endl;
      cout<<"Mobile number of "<<i<<" person: "<<mn<<endl;
      cout<<"Head of family of "<<i<<" person: "<<head<<endl;
      cout<<endl;
   }
};
int main(){
   Person s[2];
   for(int i=0;i<2;i++){
      cout<<"Enter the name of "<<i+1<<" person : ";
      cin>>s[i].name;
      cout<<"Enter the address of "<<i+1<<" person: ";
      cin>>s[i].ad;
      cout<<"Enter the telephone number of "<<i+1<<" person: ";
      cin>>s[i].tn;
      cout<<"Enter the mobile number of "<<i+1<<" person: ";
      cin>>s[i].mn;
      cout<<"Enter the head of family of "<<i+1<<" person: ";
      cin>>s[i].head;
   }
   for(int i=0;i<2;i++){
      s[i].print(i+1);
   }
}
```

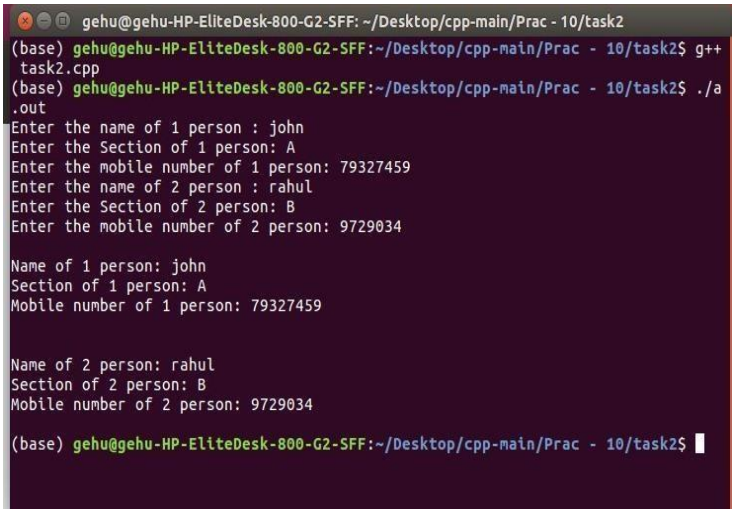
Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 10/task1
4:15 PM
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task1$ g++ task1.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task1$ ./a.out
Enter the name of 1 person : john
Enter the address of 1 person: dehradun
Enter the telephone number of 1 person: 859792897
Enter the mobile number of 1 person: 83975903
Enter the head of family of 1 person: him
Enter the name of 2 person : stephen
Enter the address of 2 person: dehradun
Enter the telephone number of 2 person: 9729047
Enter the mobile number of 2 person: 698328
Enter the head of family of 2 person: no
Name of 1 person: john
Address of 1 person: dehradun
Telephone number of 1 person: 859792897
Mobile number of 1 person: 83975903
Head of family of 1 person: him
Name of 2 person: stephen
Address of 2 person: dehradun
Telephone number of 2 person: 9729047
Mobile number of 2 person: 698328
Head of family of 2 person: no
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task1$

10.2
Source code:-

```
#include<iostream>
using namespace std;
class Person{
   string name;
   char ad;
   long long mn;
public:
   void setA(int i){
      cout<<"Enter the name of "<<i+1<<" person : ";
      cin>>this->name;
      cout<<"Enter the Section of "<<i+1<<" person: ";
      cin>>this->ad;
      cout<<"Enter the mobile number of "<<i+1<<" person: ";
      cin>>this->mn;
   }
   void print(int i){
      cout<<endl;
      cout<<"Name of "<<i<<" person: "<<name<<endl;
      cout<<"Section of "<<i<<" person: "<<ad<<endl;
      cout<<"Mobile number of "<<i<<" person: "<<mn<<endl;
      cout<<endl;
   }
};
int main(){
   Person s1,s2;
   Person *p1=&s1,*p2=&s2;
   p1->setA(0);
   p2->setA(1);
   p1->print(1);
   p2->print(2);
}
```

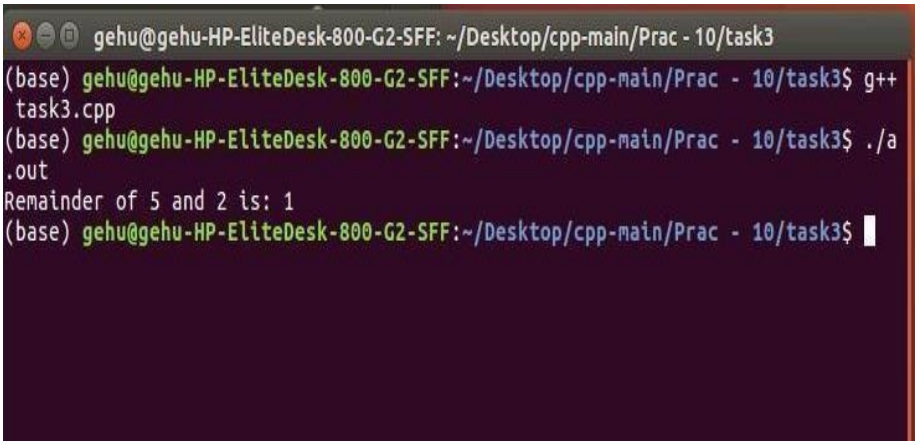
Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 10/task2
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task2$ g++
task2.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task2$ ./a
.out
Enter the name of 1 person : john
Enter the Section of 1 person: A
Enter the mobile number of 1 person: 79327459
Enter the name of 2 person : rahul
Enter the Section of 2 person: B
Enter the mobile number of 2 person: 9729034
Name of 1 person: john
Section of 1 person: A
Mobile number of 1 person: 79327459
Name of 2 person: rahul
Section of 2 person: B
Mobile number of 2 person: 9729034
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task2$

10.3
Source code:-

```
#include<iostream>
using namespace std;
class Rem{
   int a;
   int b;
   int rem;
public:
   Rem(int a,int b){
      this->a=a;
      this->b=b;
      this->rem=a%b;
   }
   int  getA(){
      return this->a;
   }
   int  getB(){
      return this->b;
   }
   int get(){
      return this->rem;
   }
};
int main(){
   Rem s(5,2);
   cout<<"Remainder of "<<s.getA()<<" and "<<s.getB()<<" is:
"<<s.get()<<endl;
}
```

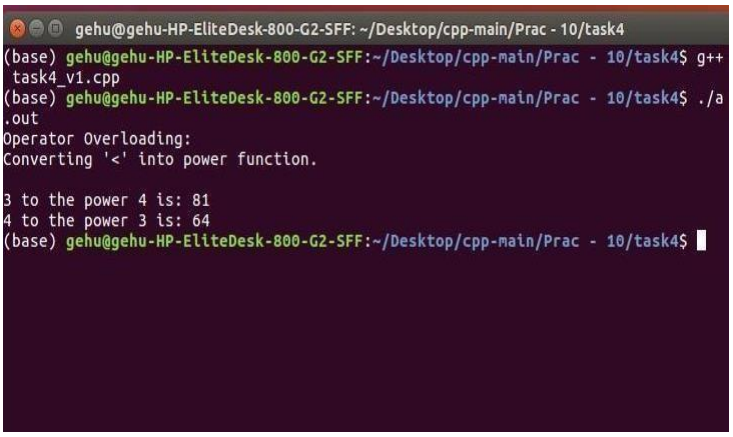
Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 10/task3
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task3$ g++
task3.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task3$ ./a
.out
Remainder of 5 and 2 is: 1
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task3$

10.4(v1)
Source code:-

```
#include<iostream>
#include<cmath>
using namespace std;
class Number{
   public:
      int n;
      Number(int m){
         this->n=m;
      }
      friend int operator < (Number &, Number &);
};
int operator < (Number &c1,Number &c2){
   return pow(c1.n,c2.n);
}
int main(){
   cout<<"Operator Overloading:"<<endl;
   cout<<"Converting '<' into power function."<<endl<<endl;
   Number n1(3),n2(4);
   Number n3=n1<n2;
   cout<<n1.n<<" to the power "<<n2.n<<" is: "<<n3.n<<endl;
   Number n4=n2<n1;
   cout<<n2.n<<" to the power "<<n1.n<<" is: "<<n4.n<<endl;
}
```

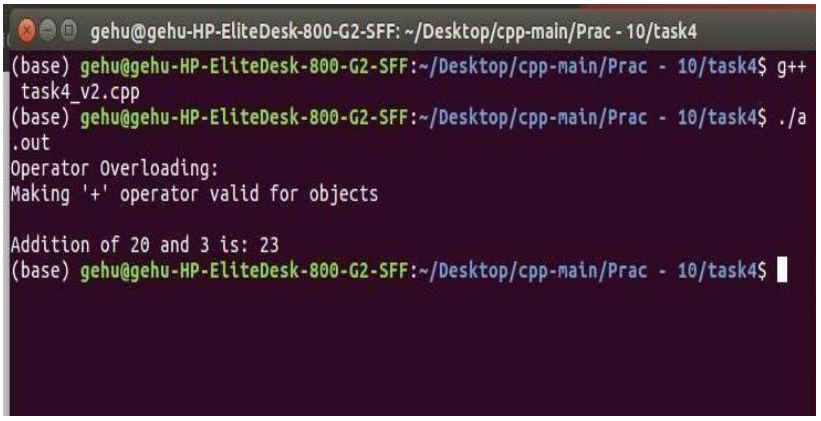
Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 10/task4
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task4$ g++
task4_v1.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task4$ ./a
.out
Operator Overloading:
Converting '<' into power function.
3 to the power 4 is: 81
4 to the power 3 is: 64
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task4$

10.4(v2)
Source code:-

```
#include<iostream>
using namespace std;
class Number{
   public:
      int n;
      Number(int m){
         this->n=m;
      }
};
int operator + (Number &c1,Number &c2){
   return c1.n+c2.n;
}
int main(){
   cout<<"Operator Overloading:"<<endl;
   cout<<"Making '+' operator valid for objects"<<endl<<endl;
   Number n1(20),n2(3);
   Number n3=n1+n2;
   cout<<"Addition of "<<n1.n<<" and "<<n2.n<<" is: "<<n3.n<<endl;
}
```

Output:-


gehu@gehu-HP-EliteDesk-800-G2-SFF: ~/Desktop/cpp-main/Prac - 10/task4
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task4$ g++
task4_v2.cpp
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task4$ ./a
.out
Operator Overloading:
Making '+' operator valid for objects
Addition of 20 and 3 is: 23
(base) gehu@gehu-HP-EliteDesk-800-G2-SFF:~/Desktop/cpp-main/Prac - 10/task4$

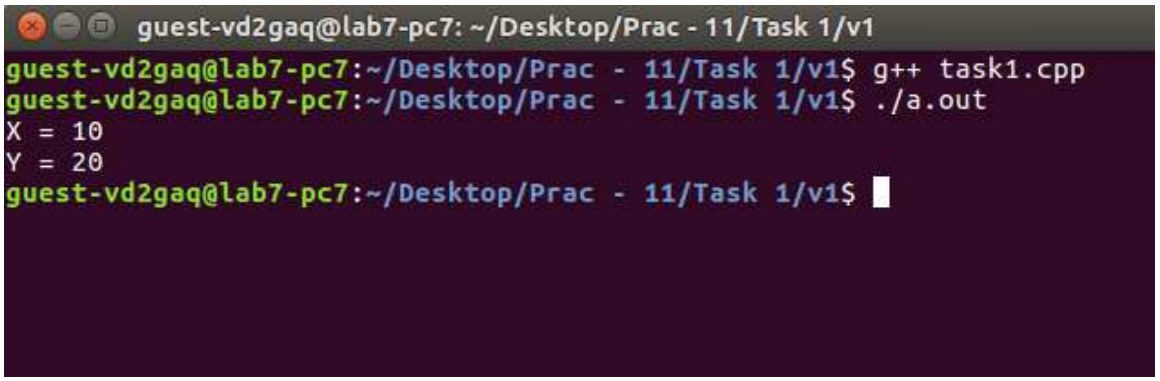
Practical 11

11.1 v1

Source Code:-

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

class A
{
        public:
        int x;
        int y;
};

class B : public A
{
        public:
        void
display()
        {
                x=10;
                y=20;

        cout<<"X =
"<<x<<endl;

        cout<<"Y =
"<<y<<endl;
        }
};

int main()
{
B obj;
obj.display();
return 0;
}
```

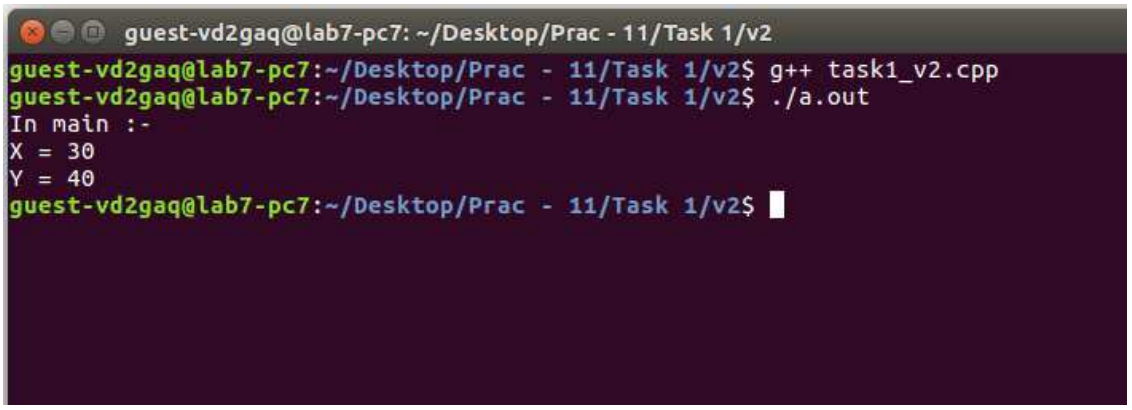
OUTPUT


guest-vd2gaq@lab7-pc7: ~/Desktop/Prac - 11/Task 1/v1
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 1/v1$ g++ task1.cpp
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 1/v1$ ./a.out
X = 10
Y = 20
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 1/v1$

11.1 v2
Source Code:-

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

class A
{
        public:
        int x;
        int y;
};


class B : public A
{
        public:
        void display()
        {
                x=10;
                y=20;
                cout<<"X = "<<x<<endl;
                cout<<"Y = "<<y<<endl;
        }
};

int main()
{
B obj;
obj.x = 30;
obj.y = 40;
cout<<"In main :-"<<endl;
cout<<"X = "<<obj.x<<endl;
cout<<"Y = "<<obj.y<<endl;
return 0;
}
```

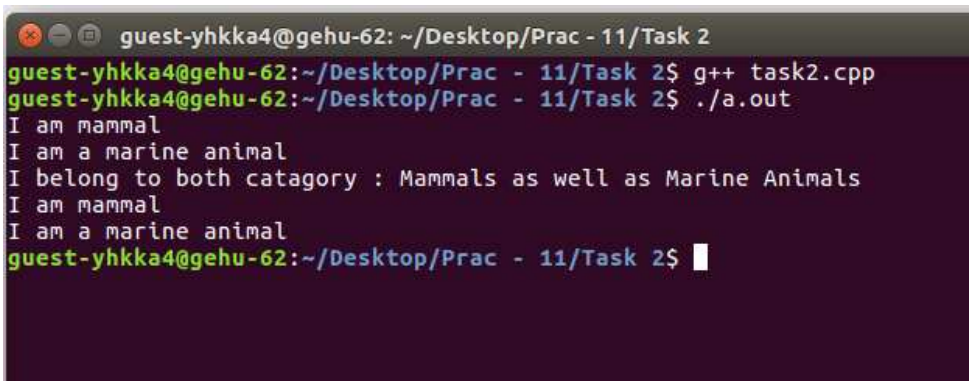
OUTPUT:-


guest-vd2gaq@lab7-pc7: ~/Desktop/Prac - 11/Task 1/v2
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 1/v2$ g++ task1_v2.cpp
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 1/v2$ ./a.out
In main :-
X = 30
Y = 40
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 1/v2$

11.2
Source Code:-

```
#include<iostream>
using namespace std;
class Mammals
{
   public:
   void display1()
   {
      cout<<"I am mammal"<<endl;
   }
};

class MarineAnimals
{
   public:
   void display2()
   {
      cout<<"I am a marine animal"<<endl;
   }
};

class BlueWhale:public Mammals,public MarineAnimals
{
   public:
   void display3()
   {
      cout<<"I belong to both catagory : Mammals as well as Marine Animals"<<endl;
   }
};

int main()
{
   Mammals obj1;
   MarineAnimals obj2;
   BlueWhale obj3;
   obj1.display1();
   obj2.display2();
   obj3.display3();
   obj3.display1();
   obj3.display2();
   return 0;
}
```

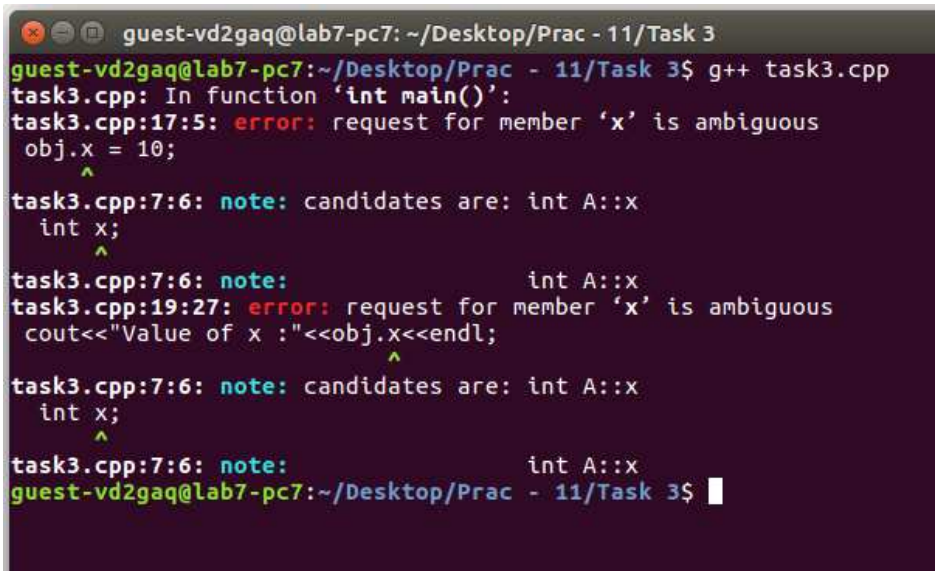
OUTPUT:-


guest-yhkka4@gehu-62: ~/Desktop/Prac - 11/Task 2
guest-yhkka4@gehu-62:~/Desktop/Prac - 11/Task 2$ g++ task2.cpp
guest-yhkka4@gehu-62:~/Desktop/Prac - 11/Task 2$ ./a.out
I am mammal
I am a marine animal
I belong to both catagory : Mammals as well as Marine Animals
I am mammal
I am a marine animal
guest-yhkka4@gehu-62:~/Desktop/Prac - 11/Task 2$

11.3 V1
Source code:-

```
#include<iostream>;
using namespace std;
class A
{
        public:
        int x;
};

class B:public A{};
class C:public A{};
class D:public B,public C{};

int main()
{
D obj;
obj.x = 10;
cout<<"In Main:-"<<endl;
cout<<"Value of x :"<<obj.x<<endl;
return 0;

}
```

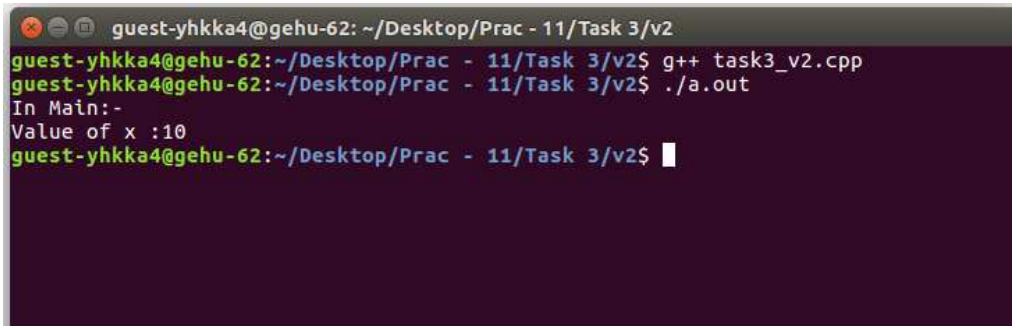
OUTPUT:-


guest-vd2gaq@lab7-pc7: ~/Desktop/Prac - 11/Task 3
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 3$ g++ task3.cpp
task3.cpp: In function 'int main()':
task3.cpp:17:5: error: request for member 'x' is ambiguous
obj.x = 10;
^
task3.cpp:7:6: note: candidates are: int A::x
int x;
^
task3.cpp:7:6: note: int A::x
task3.cpp:19:27: error: request for member 'x' is ambiguous
cout<<"Value of x :"<<obj.x<<endl;
^
task3.cpp:7:6: note: candidates are: int A::x
int x;
^
task3.cpp:7:6: note: int A::x
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 3$

11.3 v2
Source Code:-

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

class A
{
        public:
        int x;
};

class B:virtual public A{};
class C:virtual public A{};
class D:public B,public C{};

int main()
{
D obj;
obj.x = 10;
cout<<"In Main:-"<<endl;
cout<<"Value of x :"<<obj.x<<endl;
return 0;

}
```

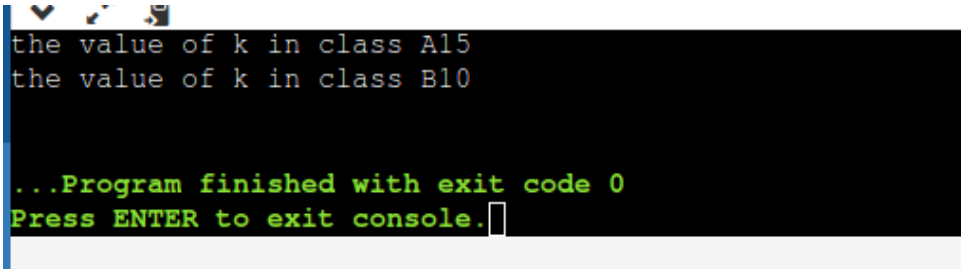
OUTPUT:-


guest-yhkka4@gehu-62: ~/Desktop/Prac - 11/Task 3/v2
guest-yhkka4@gehu-62:~/Desktop/Prac - 11/Task 3/v2$ g++ task3_v2.cpp
guest-yhkka4@gehu-62:~/Desktop/Prac - 11/Task 3/v2$ ./a.out
In Main:-
Value of x :10
guest-yhkka4@gehu-62:~/Desktop/Prac - 11/Task 3/v2$

11. 3 V3
Source code:-

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


class A
{
public:
int k = 15;
};


class B
{
public:
int k = 10;
};


class C:public A,public B{};


int main()
{
C obj;
//cout<<"The value of k "<<obj.k<<endl;
cout<<"the value of k in class A"<<obj.A::k<<endl;
cout<<"the value of k in class B"<<obj.B::k<<endl;
return 0;
}
```

OUTPUT:-

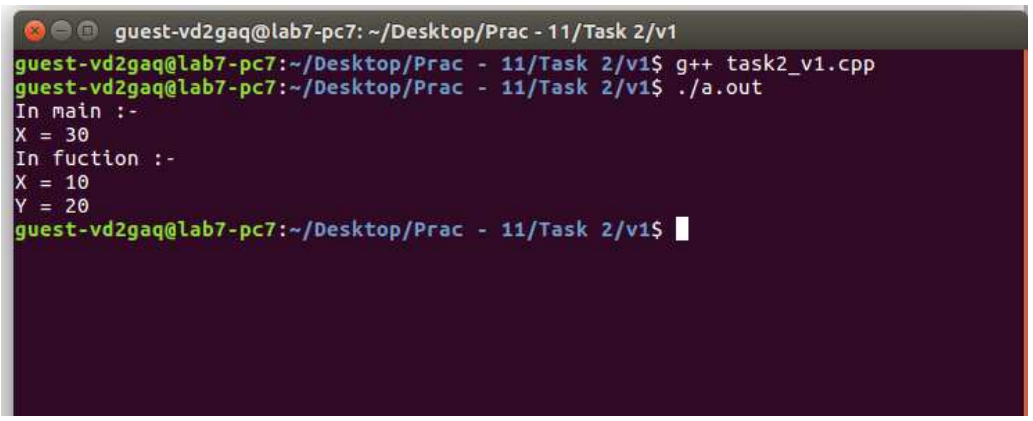

the value of k in class A15
the value of k in class B10
...Program finished with exit code 0
Press ENTER to exit console.

PRACTICAL 12

12.1 v1
Source Code:-

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

class A
{
        public:
        int x;
        protected:
        int y;
        private:
        int z;
};

class B : public A
{
        public:
        void display()
        {
                x=10;
                y=20;
                //z=30;             Error will be there
                cout<<"In fuction :-"<<endl;
                cout<<"X = "<<x<<endl;
                cout<<"Y = "<<y<<endl;
                //cout<<"Z = "<<z<<endl;   Error will be there
        }
};

int main()
{

B obj;
obj.x = 30;
//obj.y = 40;  Error will be there
//obj.z = 50;  Error will be there
cout<<"In main :-"<<endl;
cout<<"X = "<<obj.x<<endl;
obj.display();
return 0;
}
```

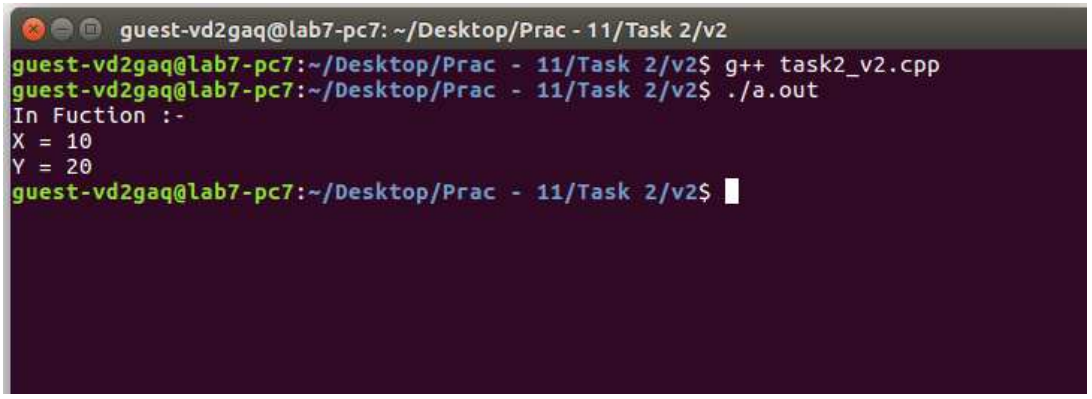
OUTPUT:-


guest-vd2gaq@lab7-pc7: ~/Desktop/Prac - 11/Task 2/v1
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v1$ g++ task2_v1.cpp
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v1$ ./a.out
In main :-
X = 30
In fuction :-
X = 10
Y = 20
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v1$

12.1 v2
Source Code:-

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

class A
{
	public:
	int x;
	protected:
	int y;
	private:
	int z;
};

class B : protected A
{
	public:
	void display()
	{
		x=10;
		y=20;
		//z=30;		Error will be there
		cout<<"In Fuction :-"<<endl;
		cout<<"X = "<<x<<endl;
		cout<<"Y = "<<y<<endl;
		//cout<<"Z = "<<z<<endl;   Error will be there
	}
};

int main()
{

B obj;
//obj.x = 30;  Error will be there
//obj.y = 40;  Error will be there
//obj.z = 50;  Error will be there
obj.display();
return 0;
}
```

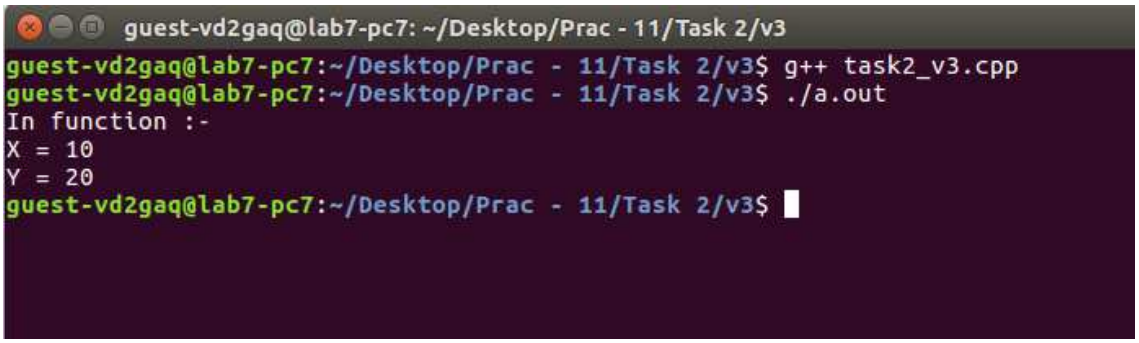
OUTPUT:-


guest-vd2gaq@lab7-pc7: ~/Desktop/Prac - 11/Task 2/v2
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v2$ g++ task2_v2.cpp
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v2$ ./a.out
In Fuction :-
X = 10
Y = 20
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v2$

12.1 v3
Source Code:-

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

class A
{
	public:
	int x;
	protected:
	int y;
	private:
	int z;
};

class B : private A
{
	public:
	void display()
	{
		x=10;
		y=20;
		//z=30;		Error will be there
		cout<<"In function :-"<<endl;
		cout<<"X = "<<x<<endl;
		cout<<"Y = "<<y<<endl;
		//cout<<"Z = "<<z<<endl;   Error will be there
	}
};

int main()
{

B obj;
//obj.x = 30;  Error will be there
//obj.y = 40;  Error will be there
//obj.z = 50;  Error will be there
obj.display();
return 0;
}
```

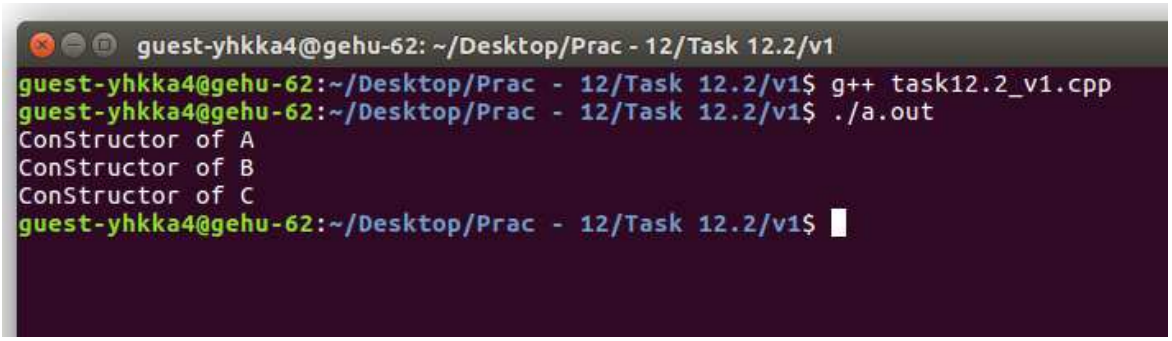
OUTPUT:-


guest-vd2gaq@lab7-pc7: ~/Desktop/Prac - 11/Task 2/v3
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v3$ g++ task2_v3.cpp
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v3$ ./a.out
In function :-
X = 10
Y = 20
guest-vd2gaq@lab7-pc7:~/Desktop/Prac - 11/Task 2/v3$

12.2 v1
Source Code:-

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

class A
{
   public:
   A()
   {
      cout << "ConStructor of A" << endl;
   }
};

class B
{
   public:
   B()
   {
      cout << "ConStructor of B" << endl;
   }
};

class C : public A, public B
{
   public:
   C()
   {
      cout << "ConStructor of C" << endl;
   }
};

int main() {
    C obj;
   return 0;
}
```

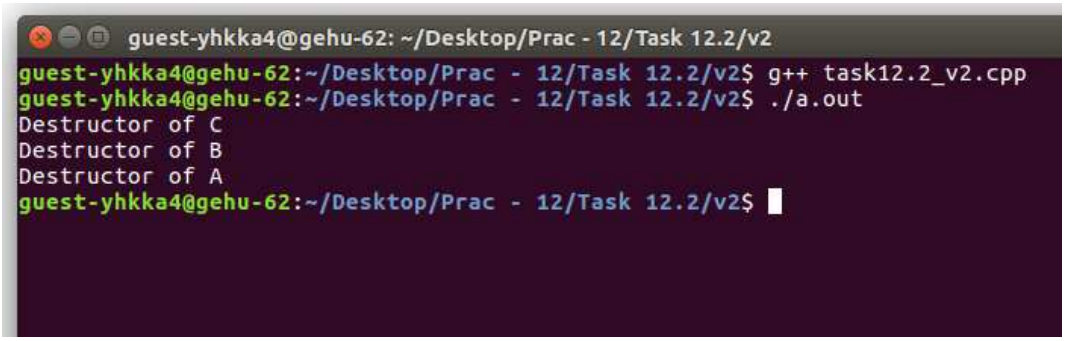
OUTPUT:-


guest-yhkka4@gehu-62: ~/Desktop/Prac - 12/Task 12.2/v1
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v1$ g++ task12.2_v1.cpp
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v1$ ./a.out
ConStructor of A
ConStructor of B
ConStructor of C
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v1$

12.2 v2
Source Code:-

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

class A
{
   public:
   ~A()
   {
      cout << "Destructor of A" << endl;
   }
};

class B
{
   public:
   ~B()
   {
      cout << "Destructor of B" << endl;
   }
};

class C : public A, public B
{
   public:
   ~C()
   {
      cout << "Destructor of C" << endl;
   }
};

int main() {
    C obj;
   return 0;
}
```

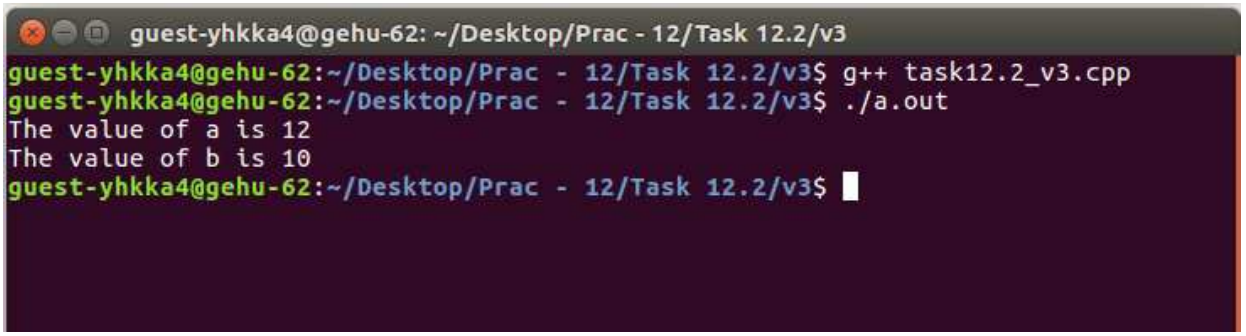
OUTPUT:-


guest-yhkka4@gehu-62: ~/Desktop/Prac - 12/Task 12.2/v2
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v2$ g++ task12.2_v2.cpp
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v2$ ./a.out
Destructor of C
Destructor of B
Destructor of A
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v2$

12.2 v3
Source Code:-

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

class A
{
   public:
   int a;
   A(int x)
   {
         a = x;
      cout << "The value of a is "<<a<<endl;
   }
};

class B:public A
{
   public:
   int b;
   B(int a,int b):A(b)
   {
      b = a;
      cout<<"The value of b is "<<b<<endl;
   }
};

int main()
{
   B obj(10,12);
   return 0;
}
```

OUTPUT:-


guest-yhkka4@gehu-62: ~/Desktop/Prac - 12/Task 12.2/v3
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v3$ g++ task12.2_v3.cpp
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v3$ ./a.out
The value of a is 12
The value of b is 10
guest-yhkka4@gehu-62:~/Desktop/Prac - 12/Task 12.2/v3$

Practical 13

13.1
Source Code:-

```
#include <iostream>
#include <string>
using namespace std;
class base
{
public:
    int add(int a, int b)
    {
        return a + b;
    }
    float add(float a, float b)
    {
        return a + b;
    }
    string add(char a, char b)
    {
        string sum;
        sum = sum + a;
        sum = sum + b;
        return sum;
    }
};
class child : public base
{
public:
    int add(int a, int b)
    {
        return a + b + 1;
    }
};
int main()
{
    base obj1;
    child obj2;
    int ans1 = obj1.add(1, 2);
    int ans2 = obj2.add(1, 2);
    cout << "Overriding function called from base class" << ans1 << endl
         << "overriding function called from child class" << ans2;
}
```

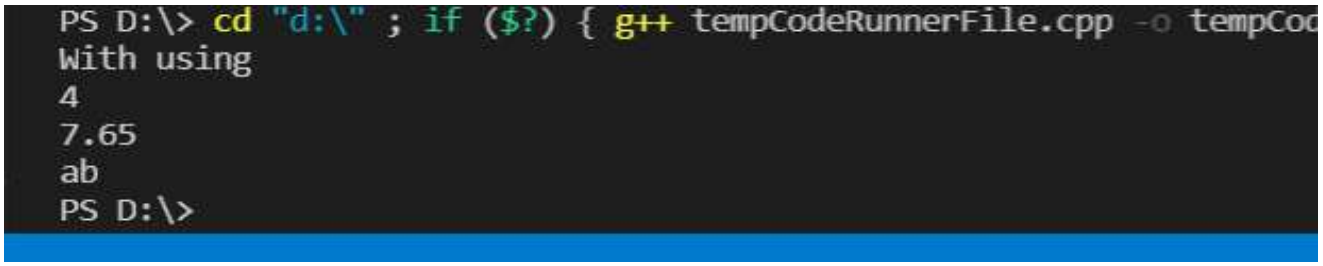
OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile
Overriding function called from base class3
overriding function called from child class4
PS D:\>

13.1 v2
Source code:-

```
#include<iostream>
#include <string>
using namespace std;
class base
{
public:
    int add(int a, int b)
    {
        return a + b;
    }
    float add(float a, float b)
    {
        return a + b;
    }
    string add(char a, char b)
    {
        string sum;
        sum = sum + a;
        sum = sum + b;
        return sum;
    }
};
class child : public base
{
public:
    using base::add;                //with using
    int add(int a, int b)
    {
        return a + b + 1;
    }
};
int main()
{
    child obj2;
    int ans1 = obj2.add(1, 2);
    float ans2 = obj2.add(5.5f, 2.15f);
    string ans3 = obj2.add('a', 'b');
    cout << "With using " << endl
         << ans1 << endl
         << ans2 << endl
         << ans3;
}
```

OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCod
With using
4
7.65
ab
PS D:\>

13.1 v2 (1)
Source Code:-

```
#include <iostream>
 #include <string>
 using namespace std;
 class base
{
public:
int add(int a, int b)
{
return a + b;
}
float add(float a, float b)
{
return a + b;
}
string add(char a, char b)
{
string sum; sum = sum + a; sum = sum + b; return sum;
}
};
class child : public base
{
public:
int add(int a, int b)
{
return a + b + 1;
}
};
int main()
{
child obj2;
int ans1 = obj2.add(1, 2);
float ans2 = obj2.add(5.5f, 2.15f); cout << "without using " << endl
<< ans1 << " " << ans2;
}
```

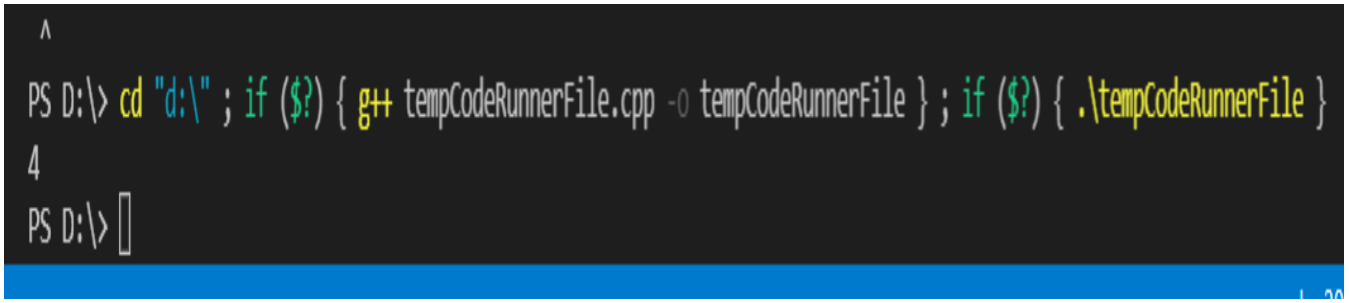
OUTPUT:-

```
PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
without using
4 8
PS D:\>
```

13.2 v1
Source Code:-

```
#include <iostream>
#include <string>
using namespace std;
 class base
{
public:
virtual int add(int a, int b)
{
return a + b;
}
virtual int multi(int a, int b) = 0; };
class child : public base
{
public:
int add(int a, int b) {
return a + b + 1;
}
int multi(int a, int b)
{
return a * b;
}
};
int main()
{
base *p; child c; p = &c;
cout << p->add(1, 2);
}
```

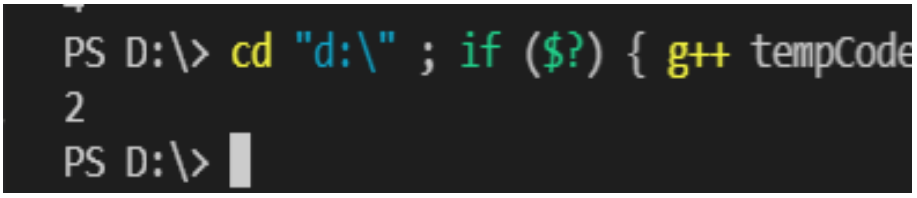
OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
4
PS D:\>

13.2 v2
Source Code:-

```
#include <iostream>
#include <string>
using namespace std;
class base
{
public:
virtual int add(int a, int b) {
return a + b;
}
virtual int multi(int a, int b) = 0; };
class child : public base
{
public:
int add(int a, int b)
{
return a + b + 1;
}
int multi(int a, int b)
{
return a * b;
}
};
int main()
{
base *p; child c; p = &c;
cout << p->multi(1, 2);
}
```

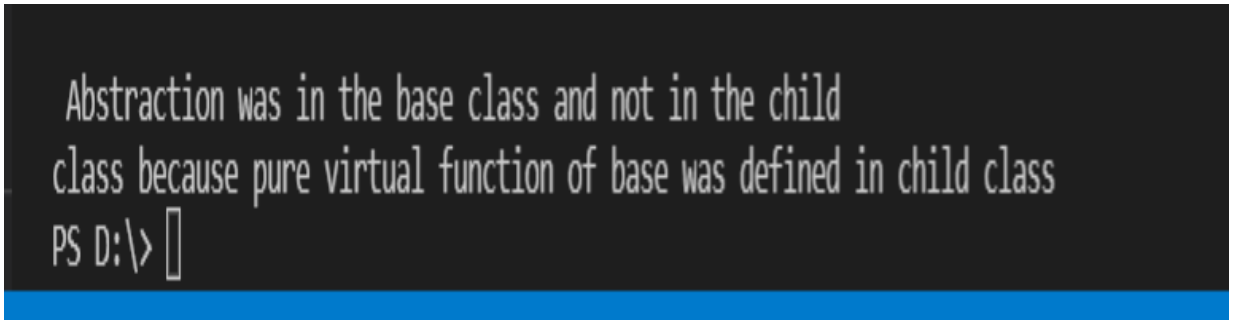
OUTPUT:-



13.2 v3
Source Code:-

```
#include <iostream>
#include <string>
using namespace std;
 class base
{
public:
virtual int add(int a, int b){
return a + b;
}
virtual int multi(int a, int b) = 0; };
class child : public base
{
public:
int add(int a, int b){
return a + b + 1;
}
int multi(int a, int b)
{
return a * b;
}
};
int main()
{
base *p; child c; p = &c;
cout << endl
<< " Abstraction was in the base class and not in the child" << endl
<< "class because pure virtual function of base was defined in child class" << endl;
}
```

OUTPUT:-

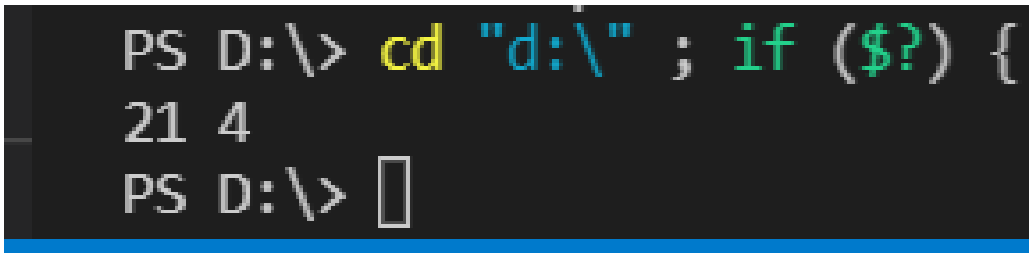

Abstraction was in the base class and not in the child
class because pure virtual function of base was defined in child class
PS D:\>

Practical 14

14.1
Source Code:-

```
#include<iostream>
#include <string>
using namespace std;
class base
{
public:
    virtual int add(int a, int b)
    {
        return a + b;
    }
    int multi(int a, int b)
    {
        return a * b;
    }
};
class child : public base
{
public:
    int add(int a, int b)
    {
        return a + b + 1;
    }
    int multi(int a, int b)
    {
        return a / b;
    }
};
int main()
{
    base *p;
    child c;
    p = &c;
    cout << p->multi(3, 7) << " "; // early binding (compile time binding)
    cout << p->add(1, 2);          // late binding (run time binding)
}
```

OUTPUT:-



14.2 v1
Source Code:-

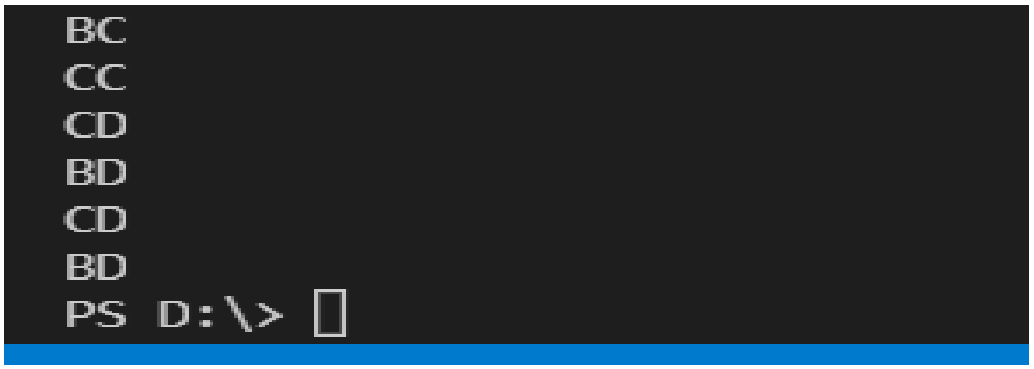
```
#include <iostream>
#include <string>
using namespace std;
class base
{
public:
base()
{
cout << "BC" << endl;
}
~base()
{
cout << "BD" << endl;
}
};
class child : public base
{
public:
child()
{
cout << "CC" << endl;
}
~child()
{
cout << "CD" << endl;
}
};
int main()
{
base *p; child c; p = &c;
delete p;
}
```

OUTPUT:-

14. 2 v2
Source code:-

```
#include <iostream>
#include <string>
using namespace std;
class base
{
public:
base()
{
cout << "BC" << endl;
}
virtual ~base()
{
cout << "BD" << endl;
}
};
class child : public base
{
public:
child()
{
cout << "CC" << endl;
}
~child()
{
cout << "CD" << endl;
}
};
int main()
{
base *p; child c; p = &c; delete p;
}
```

OUTPUT:-

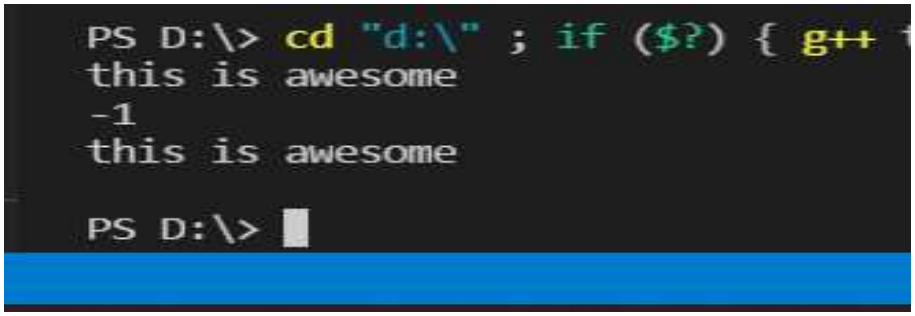


Practical 15

15.1
Source Code:-

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


int main()
{
		ofstream write;
		string name;

		write.open("Sample.txt");
		while(write)
		{
		 getline(cin,name);
		 if(name== "-1" )
			break;
		 write << name << endl;
		}
		write.close();
		ifstream read;
		read.open("Sample.txt");
		while(read)
		{
		 getline(read,name);
		 cout << name << endl;
		}

		read.close();
		return 0;

}
```

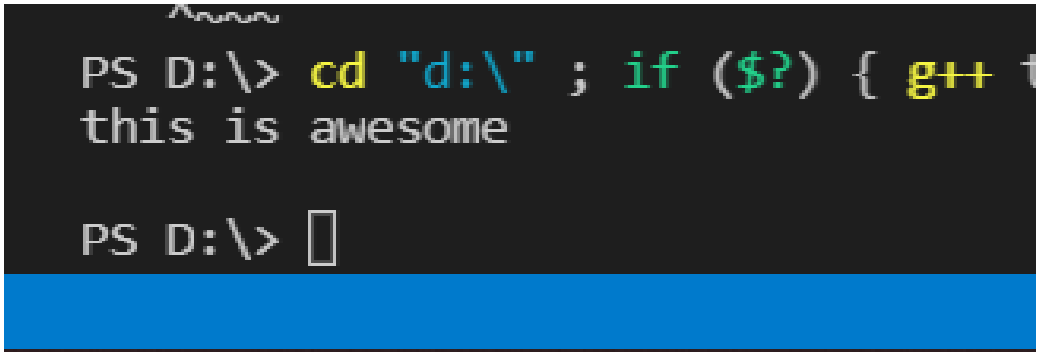
OUTPUT:-



15.2
Source code:-

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

int main()
{
	fstream myfile;
	char str;
	myfile.open("sample.txt",ios::in);
	while(!myfile.eof())
	{
		str = myfile.get();
		cout<<str;
	}
	myfile.close();
	myfile.open("sample.txt",ios::out);
	myfile <<"Indian army ";
	myfile.close();
	myfile.open("sample.txt",ios::app);
	myfile<< "is awesome";
	myfile.close();
	return 0;
}
```

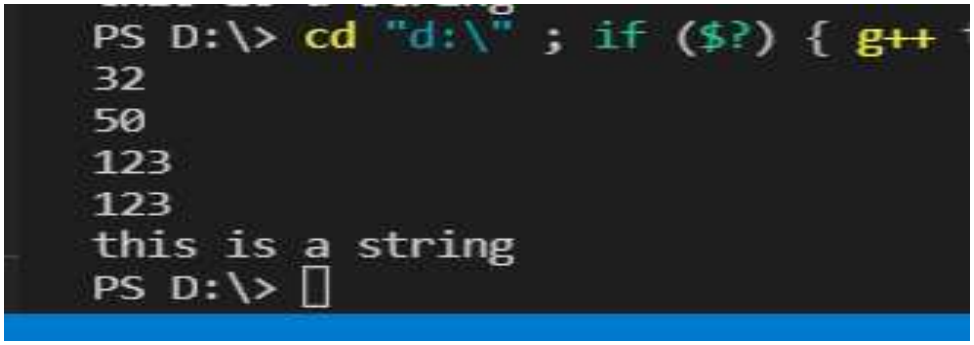
OUTPUT:-



15.3
Source Code:-

```
#include<iostream>
#include<iomanip>
#include<sstream>
#include<string>
using namespace std ;

int main()
{
int n =50;
cout << hex<< n<< endl; cout << dec<< n<< endl;

char  a,b,c; stringstream s(" 123"); s>>skipws>>a>>b>>c;
cout <<a <<b<< c<<endl;

stringstream p("123"); p>>noskipws>>a>>b>>c; cout <<a <<b<< c<<endl;

stringstream t("this is a string"); string line;
getline(t >> ws,line); cout << line<<endl;
return 0;
}
```

OUTPUT:-

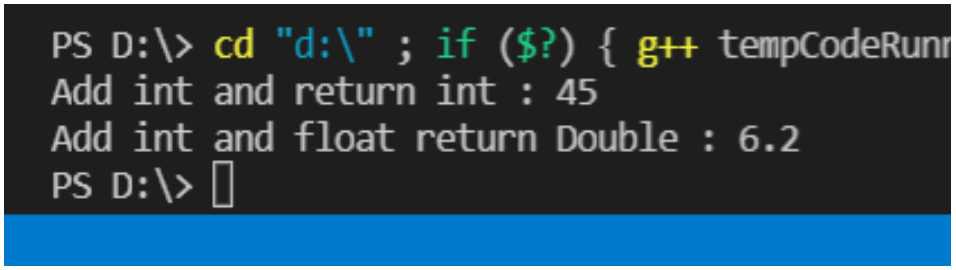


Practical 16

16.1
Source code:-

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

template <typename A, typename B, typename R> R add(A num1, B num2)
{
R ans = num1 + num2; return ans;
}

int main()
{
cout <<"Add int and return int : "<< add<int, int, int>(3,42) << endl;
cout <<"Add int and float return Double : "<< add<int, float, double>(5, 1.2f) << endl;
return 0;
}
```

OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunn
Add int and return int : 45
Add int and float return Double : 6.2
PS D:\>

16.2(v1)
Source Code:-

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

int main()
{
    int a, b;
    cout << "Enter two numbers for division \n";
    cin >> a >> b;
    try
    {
        if (b == 0)
        {
            throw runtime_error("Denominator cannot be 0\nTry something else...!!\n");
        }
        else
        {
            cout << "Result is " << a / b << "\n";
        }
    }

    catch (runtime_error &e)
    {
        cout << e.what() << "\n";
    }
    return 0;
}
```

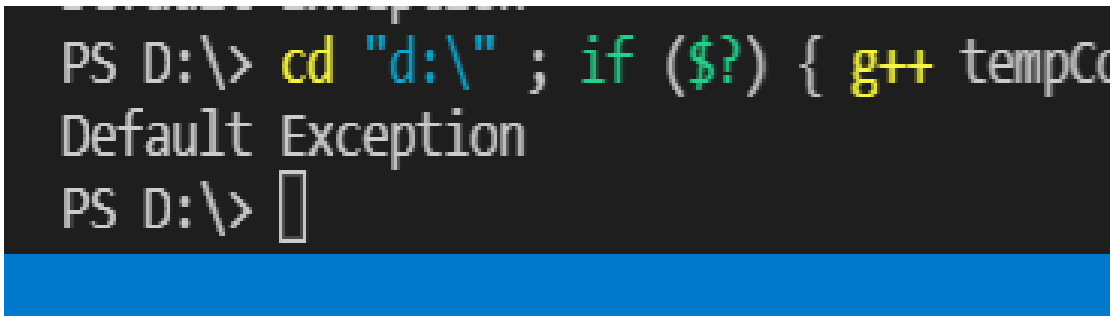
OUTPUT:-

```
PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp
Enter two numbers for division
13
0
Denominator cannot be 0
```

16.2 (v2)
Source code:-

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

int main()
{
    try
    {
        throw 'a';
    }
    catch (int x)
    {
        cout << "caught" << x << "\n";
    }

    catch (...)
    {
        cout << "Default Exception\n";
    }
    return 0;
}
```

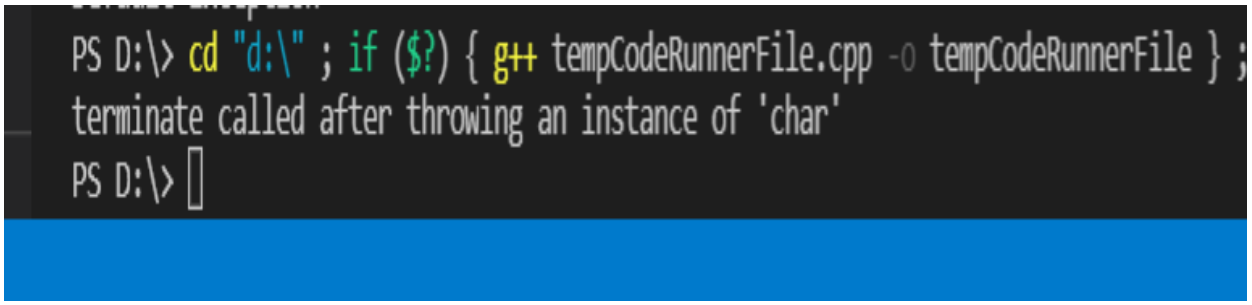
OUTPUT:-



16.2(v3)
Source Code:-

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

int main()
{
    try
    {
        throw 'a';
    }
    catch (int x)
    {
        cout << "caught" << x << "\n";
    }
    return 0;
}
```

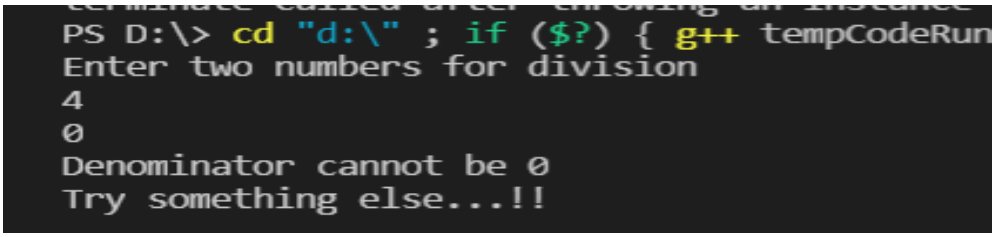
OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ;
terminate called after throwing an instance of 'char'
PS D:\>

16.4(v4)
Source Code:-

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

void divide(int a, int b)
{
    if (b == 0)
    {
        throw runtime_error("Denominator cannot be 0\nTry something else...!!\n");
    }
    else
    {
        cout << "Result is " << a / b << "\n";
    }
}

int main()
{
    int a, b;
    cout << "Enter two numbers for division \n";
    cin >> a >> b;
    try
    {
        divide(a, b);
    }
    catch (runtime_error &e)
    {
        cout << e.what() << "\n";
    }
    return 0;
}
```

OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRun
Enter two numbers for division
4
0
Denominator cannot be 0
Try something else...!!

PRACTICAL 17

17.1
Source Code:-

```
#include<iostream>
#include<list>
using namespace std;
int main()
{
   list<int> myList{8,9,2,3,1,9,3,9,1};

   //1. Iterate a int list using iterator and print it
   list<int>::iterator i = myList.begin();
   while(i!=myList.end())
   {
      cout<<*i<<" ";
      i++;
   }
   cout<<endl;

   //2. Find size of a list
   cout<<"Size of the list is: "<<myList.size()<<endl;

   //3. Sort a list
   myList.sort();
   cout<<"Sorted List : ";
   for(auto itr = myList.begin(); itr != myList.end(); itr++)
      cout<<*itr<<" ";
   cout<<endl;

   //4. Reverse a list
   myList.reverse();
   cout<<"Reversed list: ";
   for(auto itr = myList.begin(); itr != myList.end(); itr++)
      cout<<*itr<<" ";
   cout<<endl;
   return 0;
}
```

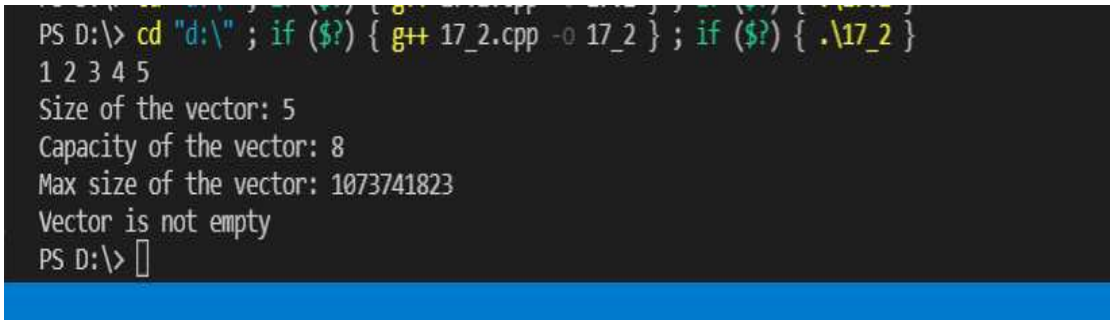
OUTPUT:-

```
PS D:\> cd "d:\" ; if ($?) { g++ dj.cpp -o dj } ; if ($?) { .\dj }
8 9 2 3 1 9 3 9 1
Size of the list is: 9
Sorted List : 1 1 2 3 3 8 9 9 9
Reversed list: 9 9 9 8 3 3 2 1 1
PS D:\>
```

17.2
Source Code:-

```
#include<iostream>
#include<vector>
using namespace std;
int main()
{
   vector<int> v;

   //1. Insert elements into a int vector
   for(int i=1;i<=5;i++)
      v.push_back(i);

   //2. Iterate this vector using iterator and print it
   vector<int>::iterator i=v.begin();
   while(i != v.end())
   {
      cout<<*i<<" ";
      i++;
   }
   cout<<endl;

   //3. Find size of a capacity and max size of a vector
   cout<<"Size of the vector: "<<v.size()<<endl;
   cout<<"Capacity of the vector: "<<v.capacity()<<endl;
   cout<<"Max size of the vector: "<<v.max_size()<<endl;

   //4. Resize a vector
   v.resize(3);

   //5. checks if the vector is empty or not
   if(v.empty())
      cout<<"Vector is empty"<<endl;
   else
      cout<<"Vector is not empty"<<endl;

   return 0;
}
```

OUTPUT:-


PS D:\> cd "d:\" ; if ($?) { g++ 17_2.cpp -o 17_2 } ; if ($?) { .\17_2 }
1 2 3 4 5
Size of the vector: 5
Capacity of the vector: 8
Max size of the vector: 1073741823
Vector is not empty
PS D:\>

17.3
Source Code:-

```
#include<iostream>
#include<string>
#include<map>
using namespace std;
int main()
{
   map<int, string> m;
   //1. Insert elements into a <int, string> map
   m.insert(pair<int,string>(1,"one"));
   m.insert(pair<int,string>(2,"two"));

   //2. insert elements in random order
   m.insert(pair<int, string>(5,"five"));
   m.insert(pair<int, string>(9,"nine"));

   //3. Iterate this map using iterator and print its keys and values
   map<int, string>::iterator i;
   for(i=m.begin();i!=m.end();i++)
      cout<<i->first<<"->"<<i->second<<endl;

   //4. Find an element as key from this map
   i=m.find(9);
   cout<<"Iterator points to: "<<i->first<<"->"<<i->second<<endl;

   //5. assigning the elements from map1 to map2
   map<int, string> m2(m.begin(),m.end());

   //6. remove all elements with key = x (any key present in map)
   int a=m2.erase(5);
   cout<<a<<" has been removed"<<endl;

   //7. Find size, max size of a map
   cout<<"Size of the map: "<<m2.size()<<endl;
   cout<<"Max size of the map: "<<m2.max_size()<<endl;

   //8. checks if this map is empty or not
   if(m2.empty())
      cout<<"map is empty"<<endl;
   else
      cout<<"map is not empty"<<endl;

   //9. Clear a map
   m2.clear();
   cout<<"map has been cleared"<<endl;

   return 0;

}
```

OUTPUT:-

```
PS D:\> cd "d:\" ; if ($?) { g++ 17_3.cpp -o 17_3 } ; if ($?) { .\17_3 }
1->one
2->two
5->five
9->nine
Iterator points to: 9->nine
1 has been removed
Size of the map: 3
Max size of the map: 97612893
map is not empty
map has been cleared
PS D:\>
```

17.4
Source Code:-

```
#include<iostream>
#include<vector>
#include<algorithm>
using namespace std;
int main()
{
   int a[]={7,6,5,8,9,3,4,7,1,2,9,6};
   int size = sizeof(a)/sizeof(a[0]);

   //1. Covert an Array into a Vector
   vector<int> v(a,a+size);
   cout<<"Vector is: ";
   for(int i=0;i<size;i++)
      cout<<v[i]<<" ";
   cout<<endl;

   //2. Sort a Vector
   sort(v.begin(),v.end());
   cout<<"Sorted vector: ";
   for(int i=0;i<size;i++)
      cout<<v[i]<<" ";
   cout<<endl;

   //3. Reverse a vector
   reverse(v.begin(), v.end());
   cout<<"Reversed vector: ";
   for(int i=0;i<size;i++)
      cout<<v[i]<<" ";
   cout<<endl;

   //4. Max element in a Vector
   cout<<"Max element of the vector: "<<*(max_element(v.begin(),v.end()));
   cout<<endl;

   //5. Min element in a Vector
   cout<<"Min element of the vector: "<<*(min_element(v.begin(),v.end()));
   cout<<endl;

   //6. Occurrences of x in a vector
   cout<<"Occurence of 5 in the vector: "<<count(v.begin(),v.end(),5);
   cout<<endl;

   //7. Sort an Array
   sort(a,a+size);
   cout<<"Sorted array : ";
   for(int i=0;i< size;i++)
      cout<<a[i]<<" ";
   cout<<endl;

   //8. Binary Search in an Array
   if(binary_search(a,a+size,4))
      cout<<"4 is present in the array."<<endl;
   else
      cout<<"4 is not present in the array."<<endl;

   return 0;
}
```

OUTPUT:-

```
PS D:\> cd "d:\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Vector is: 7 6 5 8 9 3 4 7 1 2 9 6
Sorted vector: 1 2 3 4 5 6 6 7 7 8 9 9
Reversed vector: 9 9 8 7 7 6 6 5 4 3 2 1
Max element of the vector: 9
Min element of the vector: 1
Occurence of 5 in the vector: 1
Sorted array : 1 2 3 4 5 6 6 7 7 8 9 9
4 is present in the array.
PS D:\>
```