



**Graphic Era**  
**HILL UNIVERSITY**

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# Term work

on

## OOPs with C++

(PCS 307)

**2021-22**

**Submitted to:**

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## **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.

**Vaibhav Kumar Kapriyal**

**<Paste your signature here>**

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**GEHU, Dehradun**



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7	<p>Write C++ code for below mentioned tasks?</p> <p><b>Array and 2D Array related Questions in C++:</b></p> <p><b>Task1:</b> Create a switch statement [Manual], In Which:</p> <ul style="list-style-type: none"> <li>a. When you pass 1 your program would print current year</li> <li>b. When you pass 2 your program would print current month</li> <li>c. When you pass 3 your program would print current day</li> <li>d. When you pass 4 your program would print Not applicable</li> </ul> <p><b>Task2:</b> Create a switch statement [Using ctime], In Which:</p> <ul style="list-style-type: none"> <li>a. When you pass 1 your program would print current year</li> <li>b. When you pass 2 your program would print current month</li> <li>c. When you pass 3 your program would print current day</li> <li>d. When you pass 4 your program would print Not applicable</li> </ul> <p><b>Task3:</b></p> <p>v1. Print using reverse method:</p> <pre>1 2 3      9 8 7 4 5 6 ==&gt;  6 5 4 7 8 9      3 2 1</pre> <p>v2. Print using (10- arr[i][j]) method:</p> <pre>1 2 3      9 8 7 4 5 6 ==&gt;  6 5 4 7 8 9      3 2 1</pre> <p>v3. Restore using reverse method [without creating new array]:</p> <pre>1 2 3      9 8 7 4 5 6 ==&gt;  6 5 4</pre>	42

	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 fashion 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:

	<pre> * * * * * * * * * *</pre>	
8	<p>Write C++ code for below mentioned tasks?</p> <p><b>Pointer, Function, Inline Function, Recursion in C++:</b></p> <p><b>Task1:</b> Will the program through an error and if yes then why?</p> <pre> int *p = {10,20,20}; cout &lt;&lt; *p; p++; cout &lt;&lt; *p;</pre> <p><b>Task2:</b> Output of this program?</p> <p><b>V1.</b> Issue?</p> <pre> int arr[] = {10,20,30}; cout &lt;&lt; *arr; cout &lt;&lt; arr; arr++; cout &lt;&lt; *arr;</pre> <p><b>V2.</b> How to resolve above issue?</p> <pre> int arr[] = {10,20,30}; cout &lt;&lt; *arr; cout &lt;&lt; arr; cout &lt;&lt; *(?);</pre> <p><b>Task3:</b> Output of this program?</p> <p><b>V1.</b> Output?</p> <pre> int a = 10; int *p; int **q; p = &amp;a; q = &amp;p; cou &lt;&lt; *p; cou &lt;&lt; **q;</pre>	67

	<p><b>V2.</b> Change the value of a using q pointer to pointer.</p> <p><b>Task4:</b> Find factorial of a number using function but not recursion</p> <p><b>Task5:</b> Find factorial of a number using recursion</p> <p><b>Task6:</b> Series Problem using recursion for n series  <math>2, (2^2 + 2), (3^3 + 3), (4^4 + 4), (5^5 + 5), \dots</math></p> <p>Hint:  <math>n * ((n-1)^(n-1) + (n-1))</math></p> <p><b>Task7:</b> Perform Call by value, call by Address for swapping value of a and b:</p> <pre>int a = 10; int b = 20;</pre> <p><b>V1.</b> Swap(a,b); //call by Value [void swap(int a, int b){ }]  <b>V2.</b> Swap(a,b); //call by Value [void swap(int &amp;a, int &amp;b){ }]  <b>V3.</b> Swap(&amp;a,&amp;b); //call by Address</p>	
9	<p>Write C++ code for below mentioned tasks?</p> <p><b>Class, Object, Constructor, Static Data Members, friend function in C++:</b></p> <p><b>Task1: Class and Object in C++</b></p> <p>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'.</p> <p>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.</p> <p>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].</p> <p><b>Task2: Constructor in C++</b></p> <p>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.</p>	84

	<p><b>Task3: Static Data Members in C++</b> WAP to count the total number of calls for a member function from more than one objects. [Lets say, from 3 such Objects]</p> <p><b>Task4: Friend Function in C++</b> 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.</p> <p><b>Task5: Structure in C++</b> 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.]</p> <p><b>Task6: Extra Questions:</b> 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++]</p>	
10	<p>Write C++ code for below mentioned tasks?</p> <p><b>Array of Objects, Pointer to Object, This pointer, Operator Overloading in C++</b></p> <p><b>Task1: Array of Objects in C++</b> 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</p> <p><b>Task2: Pointer to Object in C++</b> WAP to create print or display Student information containing in Student class by using pointers to object.</p> <p><b>Task3: This pointer in C++</b> 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.</p> <p><b>Task4: Operator Overloading in C++</b>            a). WAP, in which you write a friend function to overload a less than '&lt;' 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.</p>	97



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

Name of Student ..... Mob.No.....

Photograph  
Passport Size

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

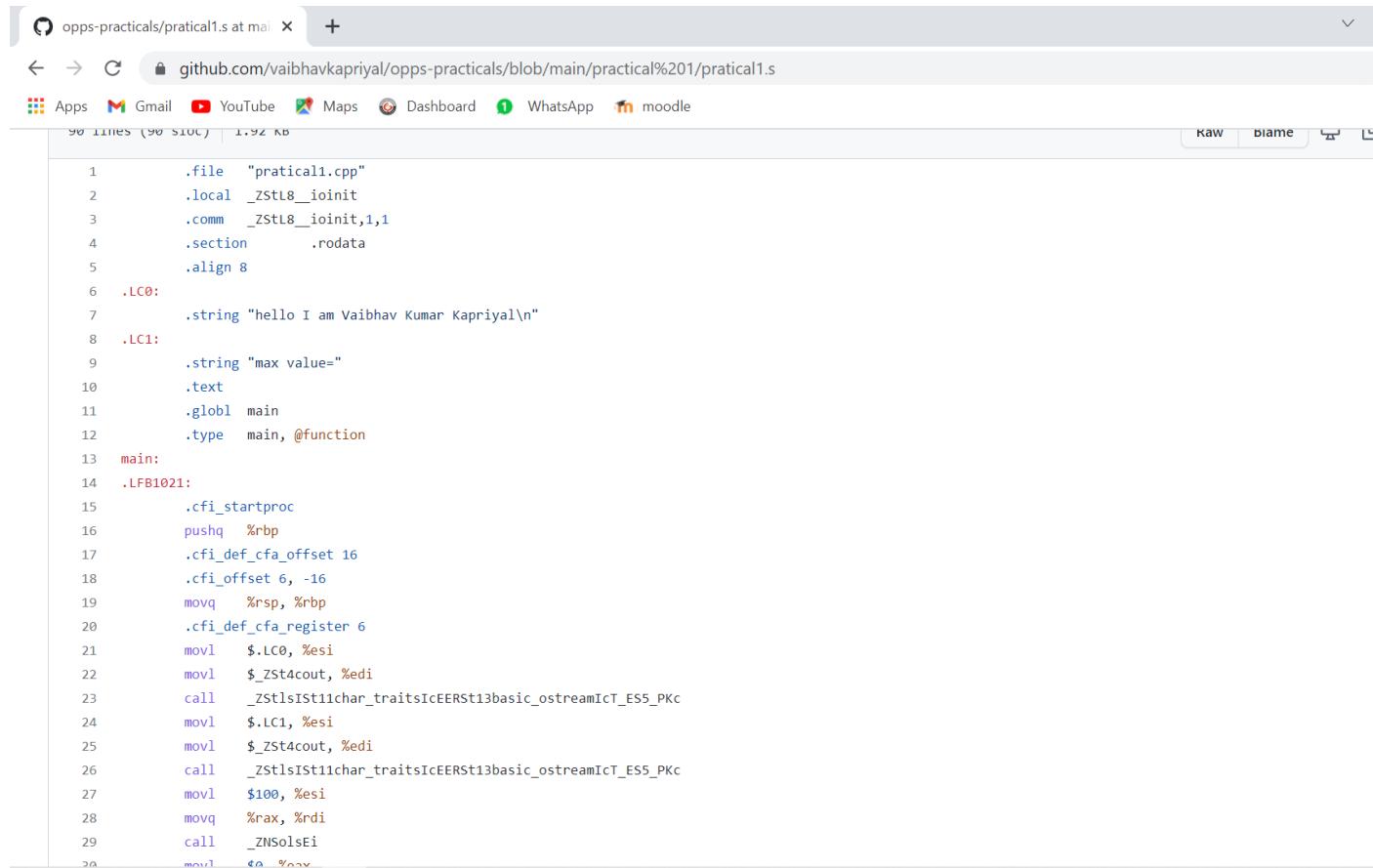
S.N o.	Practical	D.O.P.	Date of Submiss ion	Grade (Viva)	Grade (Report File)	Total Marks (out of 10)	Student's Signature	Teacher's Signature
1	Practical-01							
2	Practical-02							
3	Practical-03							
4	Practical-04							
5	Practical-05							
6	Practical-06							
7	Practical-07							
8	Practical-08							
9	Practical-09							
10	Practical-10							
11								
12								

## Practical 1

### Source Code:

```
#include
<iostream>
using namespace std;
#define MAX 100;
int main()
{
    cout<<"hello I am Vaibhav Kumar Kapriyal\n";
    cout<<"max value=" <<MAX;
    return 0;
}
```

### Output



The screenshot shows a GitHub browser interface with the URL <https://github.com/vaibhavkapriyal/opps-practicals/blob/main/practical%201/practical1.s>. The page displays the assembly code generated by the compiler for the provided C++ code. The assembly code includes directives like .file, .local, .comm, .section, .align, .LC0, .LC1, and various .text sections for the main function, along with assembly instructions such as pushq, movq, and call.

```
1      .file   "practical1.cpp"
2      .local  _ZStl8__ioinit
3      .comm   _ZStl8__ioinit,1,1
4      .section      .rodata
5      .align 8
6      .LC0:
7      .string "hello I am Vaibhav Kumar Kapriyal\n"
8      .LC1:
9      .string "max value="
10     .text
11     .globl  main
12     .type   main, @function
13     main:
14     .LFB1021:
15     .cfi_startproc
16     pushq   %rbp
17     .cfi_def_cfa_offset 16
18     .cfi_offset 6, -16
19     movq   %rsp, %rbp
20     .cfi_def_cfa_register 6
21     movl   $.LC0, %esi
22     movl   $.ZSt4cout, %edi
23     call   _ZStlsISt11char_traitsIcEERSt13basic_ostreamIcT_E5_PKc
24     movl   $.LC1, %esi
25     movl   $.ZSt4cout, %edi
26     call   _ZStlsISt11char_traitsIcEERSt13basic_ostreamIcT_E5_PKc
27     movl   $100, %esi
28     movq   %rax, %rdi
29     call   _ZNsolsEi
30     movl   $0, %eax
```

The screenshot shows a browser window with the URL [github.com/vaibhavkapriyal/opp-practicals/blob/main/practical%201/abc.i](https://github.com/vaibhavkapriyal/opp-practicals/blob/main/practical%201/abc.i). The page displays the source code of a C++ file named abc.i. The code includes several #include directives for standard headers like stdc-predef.h, iostream, and c++config.h, and defines the std namespace. It also contains inline namespaces for cxx11 attributes.

```
1 # 1 "practical1.cpp"
2 # 1 "<built-in>"
3 # 1 "<command-line>"
4 # 1 "/usr/include/stdc-predef.h" 1 3 4
5 # 1 "<command-line>" 2
6 # 1 "practical1.cpp"
7 # 1 "/usr/include/c++/5/iostream" 1 3
8 # 36 "/usr/include/c++/5/iostream" 3
9
10 # 37 "/usr/include/c++/5/iostream" 3
11
12 # 1 "/usr/include/x86_64-linux-gnu/c++/5/bits/c++config.h" 1 3
13 # 194 "/usr/include/x86_64-linux-gnu/c++/5/bits/c++config.h" 3
14
15 # 194 "/usr/include/x86_64-linux-gnu/c++/5/bits/c++config.h" 3
16 namespace std
17 {
18     typedef long unsigned int size_t;
19     typedef long int ptrdiff_t;
20
21
22
23
24 }
25 # 216 "/usr/include/x86_64-linux-gnu/c++/5/bits/c++config.h" 3
26 namespace std
27 {
28     inline namespace __cxx11 __attribute__((__abi_tag__("cxx11"))) { }
29 }
30 namespace __gnu_cxx
```

The screenshot shows a terminal window with a dark background. At the top, there are several icons and the text "sammei@kali: ~/Desktop". Below the title bar, the terminal prompt is "(sammei㉿kali)-[~/Desktop]". The user has run the command "\$ g++ t4\_1.cpp", which compiles the file "t4\_1.cpp". After compilation, they run "\$ ./a.out", which outputs "hello I am Vaibhav Kumar Kapriyal" and "max value=100". The terminal then returns to the prompt "(sammei㉿kali)-[~/Desktop]".

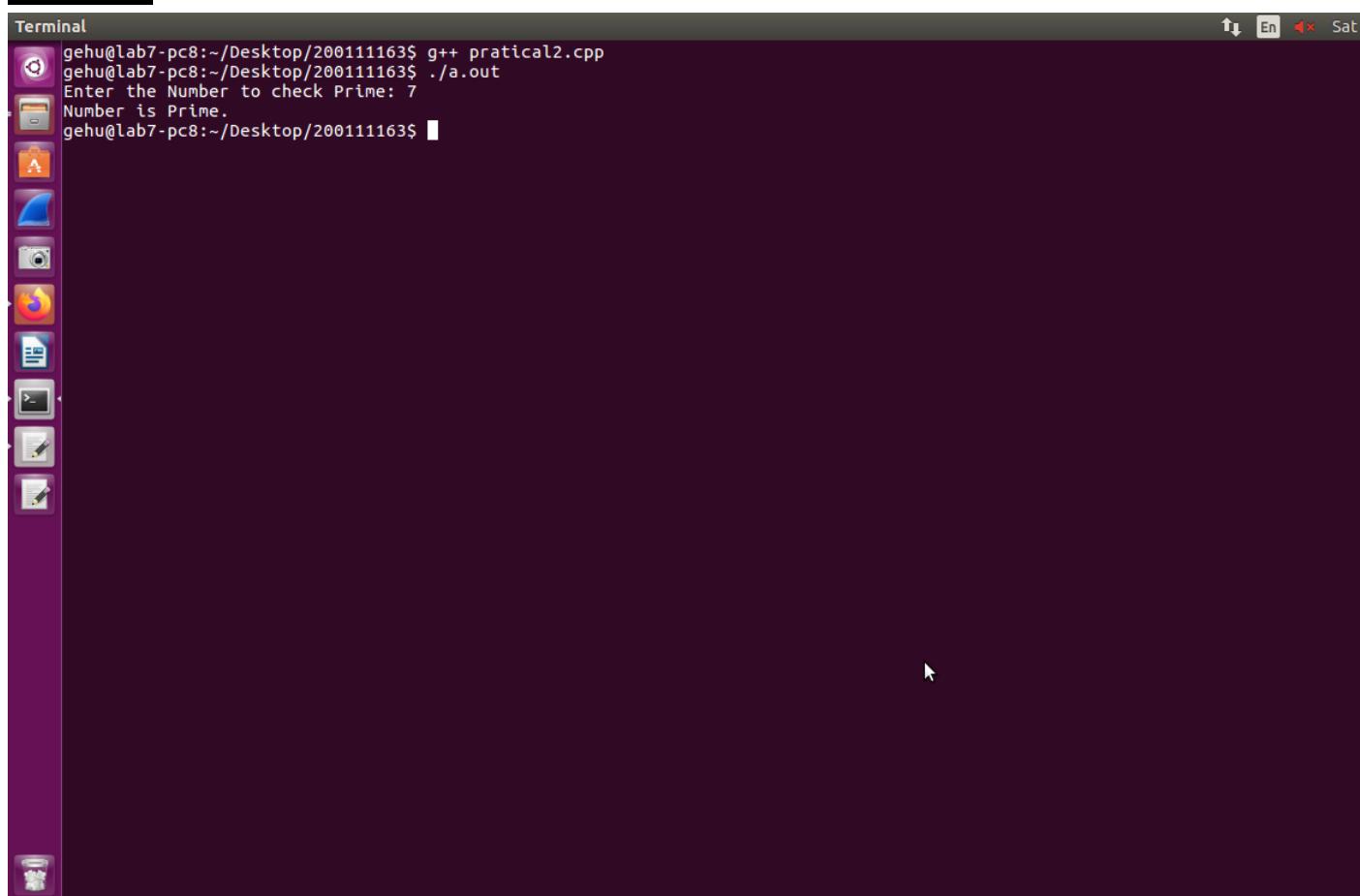
## Practical 2

### Source Code:

```
#include
<iostream>

using namespace std;
int main()
{
    int n, i, m=0, flag=0;
    cout << "Enter the Number to check Prime: ";
    cin >> n;
    m=n/2;
    for(i = 2; i <= m; i++)
    {
        if(n % i == 0)
        {
            cout<<"Number is not Prime."<<endl;
            flag=1;
            break;
        }
    }
    if (flag==0)
        cout << "Number is Prime."<<endl;
    return 0;
}
```

## Output



A screenshot of a Linux desktop environment. On the left is a vertical dock containing icons for various applications like a terminal, file manager, browser, and others. The main window is a terminal window titled "Terminal". The terminal output is as follows:

```
gehu@lab7-pc8:~/Desktop/200111163$ g++ practical2.cpp
gehu@lab7-pc8:~/Desktop/200111163$ ./a.out
Enter the Number to check Prime: 7
Number is Prime.
gehu@lab7-pc8:~/Desktop/200111163$
```

## Practical 3

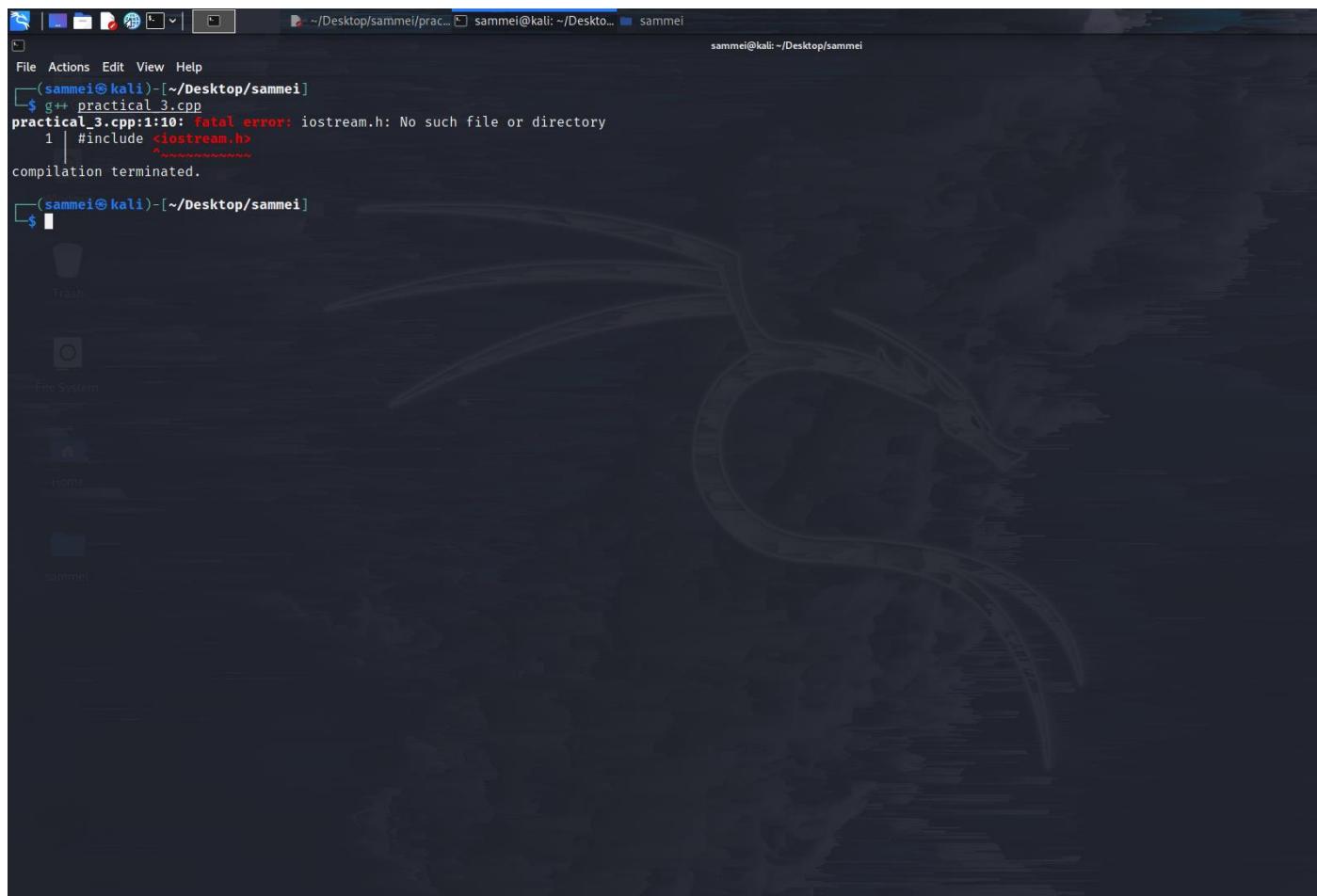
### Task 1

#### Source Code:

```
#include
<iostream.h>

using namespace std;
int main
{
    int a=60;
    cout<<"Vaibhav Kumar Kapriyal Roll no.-"<<a<<"\n";
    return 0;
}
```

#### Output



```
(sammei㉿kali)-[~/Desktop/sammei]
$ g++ practical_3.cpp
practical_3.cpp:1:10: fatal error: iostream.h: No such file or directory
  1 | #include <iostream.h>
compilation terminated.

[sammei@kali: ~]$
```

## Practical 3

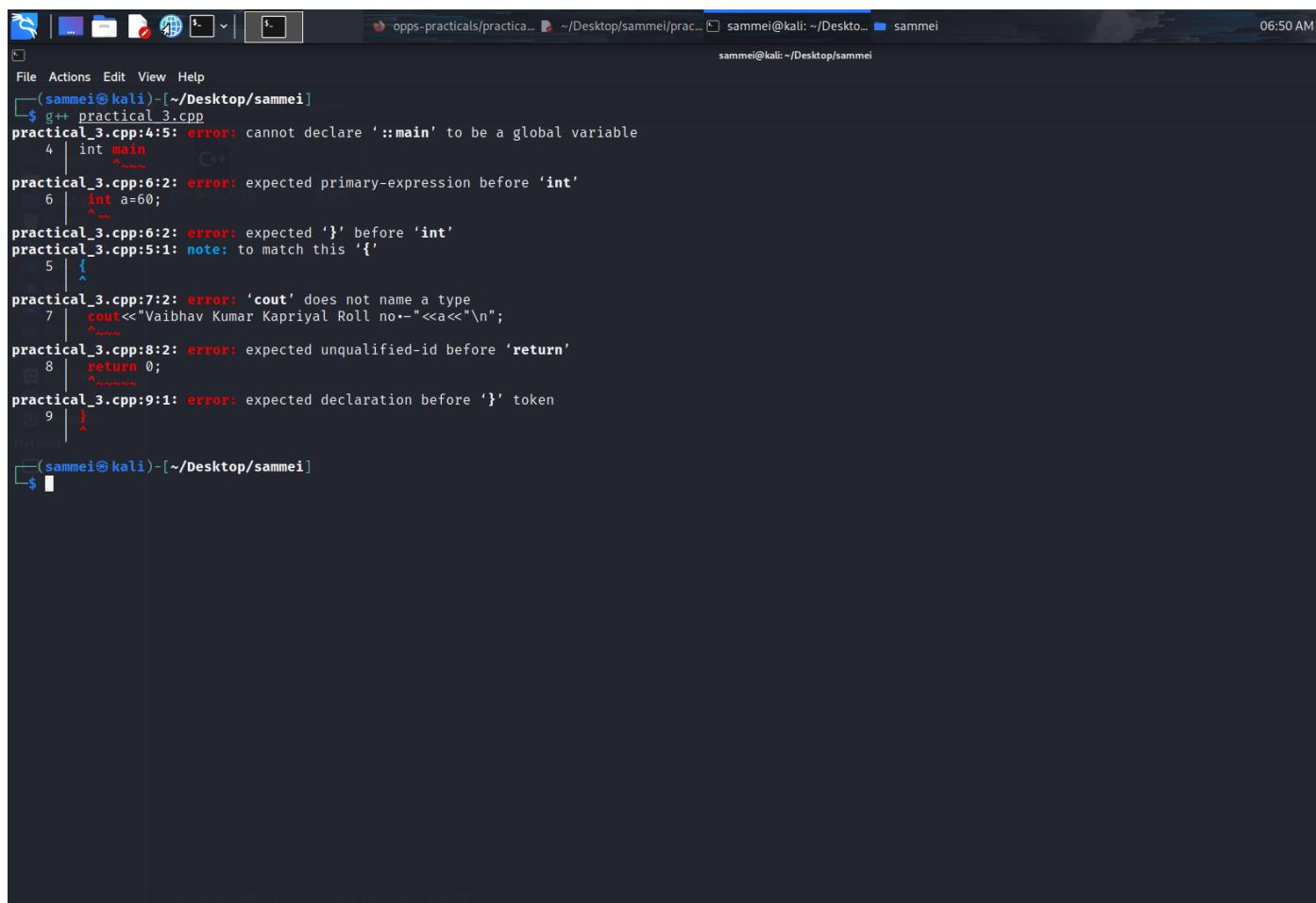
### Task 2

#### Source Code:

```
//#include
<iostream.h>

        using namespace std;
        int main
        {
            int a=60;
            cout<<"Vaibhav Kumar Kapriyal Roll no.-"<<a<<"\n";
            return 0;
        }
```

#### Output



The screenshot shows a terminal window on a Kali Linux desktop environment. The terminal is running in a terminal emulator window titled 'opp-practicals/practical...'. The command entered is \$ g++ practical\_3.cpp. The output shows several compilation errors from the g++ compiler:

```
(sammei㉿kali)-[~/Desktop/sammei]
$ g++ practical_3.cpp
practical_3.cpp:4:5: error: cannot declare '::main' to be a global variable
4 | int main
   ^~~~ C++
practical_3.cpp:6:2: error: expected primary-expression before 'int'
6 |     int a=60;
      ^~~~
practical_3.cpp:6:2: error: expected ')' before 'int'
practical_3.cpp:5:1: note: to match this '{'
5 |
practical_3.cpp:7:2: error: 'cout' does not name a type
7 |     cout<<"Vaibhav Kumar Kapriyal Roll no.-"<<a<<"\n";
      ^~~~
practical_3.cpp:8:2: error: expected unqualified-id before 'return'
8 |     return 0;
      ^~~~~~
practical_3.cpp:9:1: error: expected declaration before ')' token
9 | }
```

## Practical 3

### Task 3

#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    char c;
    cout<<"Enter a series of character\n";
    cin>>c;
    cout<<"Display:- "<<c<<"\n";
    return 0;
}
```

#### Output

The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a toolbar with icons for file operations like Open, Save, and Print. The title bar indicates the current directory is `~/Desktop/sammei/prac...`. The command line shows the user has run `g++ practical 3.cpp` and then `./a.out`. The terminal then prompts the user to "Enter a series of character" and receives the input "abcd". Finally, it displays "Display:-a". The terminal window also shows the user's name, sammei, and the host, kali.

```
(sammei㉿kali)-[~/Desktop/sammei]
$ g++ practical 3.cpp
(sammei㉿kali)-[~/Desktop/sammei]
$ ./a.out
Enter a series of character
abcd
Display:-a
```

## Practical 3

### Task 4

#### Source Code:

```
#include
<iostream>
#include <string>

using namespace std;

int main()
{
    string str;
    cout<<"Enter a series of character\n";
    getline(cin,str);
    cout<<"Display:- "<<str<<"\n";
    return 0;
}
```

#### Output

```
(sammei㉿kali)-[~/Desktop/sammei]
$ g++ practical_3.cpp
[sammei㉿kali)-[~/Desktop/sammei]
$ ./a.out
Enter a series of character
abcd
Display:-abcd
[sammei㉿kali)-[~/Desktop/sammei]
```

The screenshot shows a terminal window titled 'opp-practicals/practica...'. The terminal is running on a Kali Linux system, as indicated by the prompt '(sammei㉿kali)'. The user has compiled a C++ program named 'practical\_3.cpp' using the g++ compiler. After compilation, they run the executable 'a.out'. When prompted to enter a series of characters, the user types 'abcd'. The terminal then displays the characters back to the user, preceded by the text 'Display:-'. The terminal window also shows the desktop environment's taskbar at the top and various icons and files in the background.

## Practical 4

### Task 1

#### Source Code:

```
#include
<iostream>

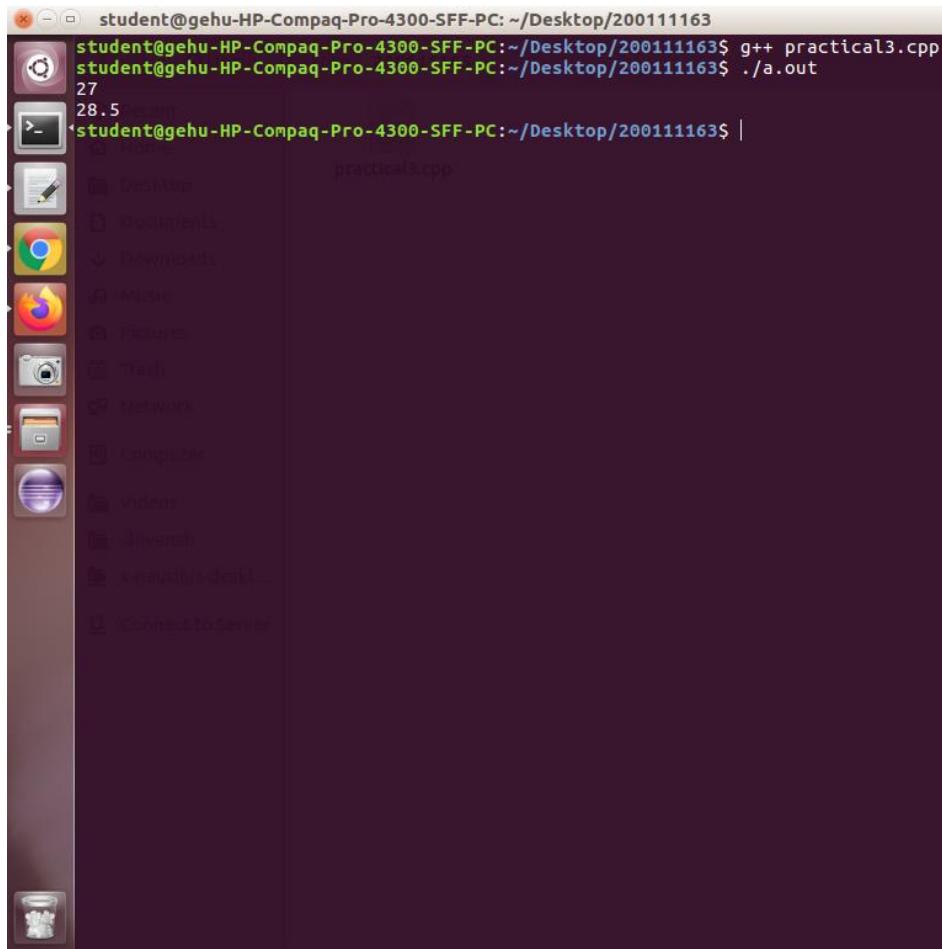
using namespace std;

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<<first::add(12,15)<<"\n";
    cout<<second::add(12.6,15.9)<<"\n";
    return 0;
}
```

## Output



A screenshot of a Linux desktop environment. On the left is a dark brown vertical dock containing icons for various applications like a terminal, file manager, and media players. The main window is a terminal window titled 'student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163'. It displays the following command-line session:

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ practical3.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
27
28.5
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

## Practical 4

### Task 2

#### 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;
    }
}

using namespace second;

int main()
{
    cout<<add(12,15)<<"\n";
    cout<<add(12.5,15)<<"\n";
    cout<<add(12,15.7)<<"\n";
    cout<<add(12.9,15.3)<<"\n";
    cout<<add(12.0,15.0)<<"\n";
    return 0;
}
```

## Output

A screenshot of a Linux desktop environment. On the left is a vertical dock containing icons for various applications like a terminal, file manager, and system settings. The main area shows a terminal window with the following text:

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ practical3.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
27
27.7 Recent
27.4
28.2 Home
27
0
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

The terminal also lists recent files: 27.7 Recent, 27.4, 28.2 Home, 27, and 0.

## Practical 4

### Task 3

#### Source Code:

```
#include
<iostream>

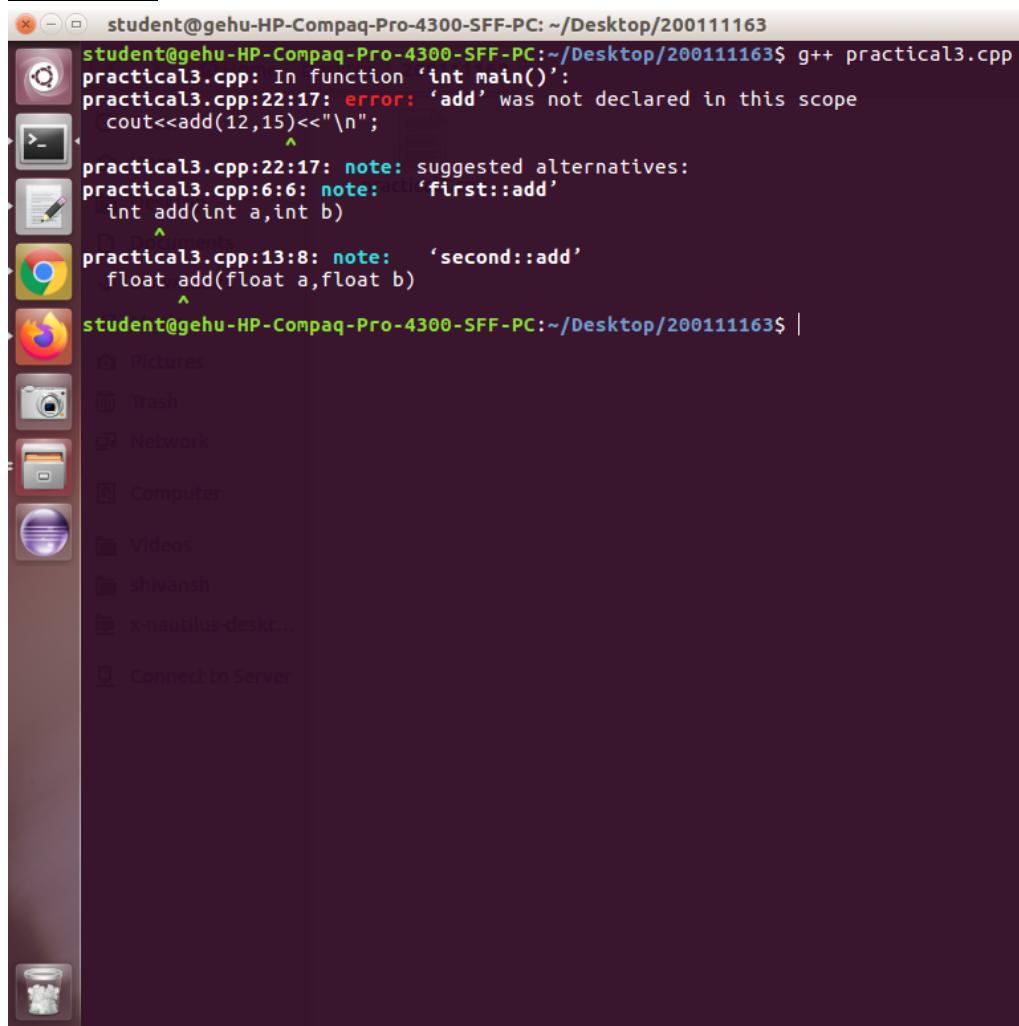
using namespace std;

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<<add(12,15)<<"\n";
    cout<<add(12.5,15)<<"\n";
    cout<<add(12,15.7)<<"\n";
    cout<<add(12.9,15.3)<<"\n";
    cout<<add(12.0,15.0)<<"\n";
    return 0;
}
```

## Output



```
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ practical3.cpp
practical3.cpp: In function 'int main()':
practical3.cpp:22:17: error: 'add' was not declared in this scope
    cout<<add(12,15)<<"\n";
                  ^
practical3.cpp:22:17: note: suggested alternatives:
practical3.cpp:6:6: note: acti'first::add'
    int add(int a,int b)
               ^
practical3.cpp:13:8: note:   'second::add'
    float add(float a,float b)
               ^
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

## Practical 5

### Task 1

#### Source Code:

```
#include
<iostream>

using namespace std;
void intfun()
{
    int a=5657865;
    cout<<a<<'\n';
}
void charfun ()
{
    char i='b';
    cout<<i<<'\n';
}
void boolfun ()
{
    bool b=1;
    cout<<b<<'n';
}
void shortfun()
{
    short s=100;
    cout<<s<<'n';
}
void floatfun()
{
    float f=12.6474f;
    cout<<f<<'\n';
}
void longfun()
{
    long l=64579745756;
    cout<<l<<'\n';
}
void doublefun()
{
    double d=3255.65658;
    cout<<d<<'n';
}
void longdoublefun()
{
    long double lb=43254.8788;
```

```

        cout<<lb<<'n';
    }
    void widecharfun()
    {
        wchar_t ch=L'\0';
        cout<<ch<<'n';
    }

    int main()
    {
        intfun();
        charfun ();
        boolfun ();
        shortfun();
        floatfun();
        longfun();
        doublefun();
        longdoublefun();
        widecharfun();
        return 0;
    }
}

```

## Output

```

(sammei㉿kali)-[~/Desktop/sammei/practical 5 c++]
$ g++ t1.cpp
(sammei㉿kali)-[~/Desktop/sammei/practical 5 c++]
$ ./a.out
5657865
b
1
100
12.6474
64579745756
3255.66
43254.9
65

```

## Practical 5

### Task 2

#### Source Code:

```
#include
<iostream>

using namespace std;
void intfun()
{
    int a=5657865;
    cout<<a<<" size= ";
    cout<<sizeof(a)<<'\n';
    cout<<"size of int = "<<sizeof(int)<<'\n';
}
void charfun ()
{
    char i='b';
    cout<<i<<" size= ";
    cout<<sizeof(i)<<'\n';
    cout<<"size of character = "<<sizeof(char)<<'\n';
}
void boolfun ()
{
    bool b=1;
    cout<<b<<" size= ";
    cout<<sizeof(b)<<'\n';
    cout<<"size of boolean = "<<sizeof(bool)<<'\n';
}
void shortfun()
{
    short s=100;
    cout<<s<<" size= ";
    cout<<sizeof(s)<<'\n';
    cout<<"size of short int = "<<sizeof(short)<<'\n';
}
void floatfun()
{
    float f=12.6474f;
    cout<<f<<" size= ";
    cout<<sizeof(f)<<'\n';
    cout<<"size of float = "<<sizeof(float)<<'\n';
}
void longfun()
{
    long l=64579745756;
```

```

        cout<<l<<"  size=  ";
        cout<<sizeof(l)<<'\n';
        cout<<"size of long int = "<<sizeof(long)<<'\n';
    }
    void doublefun()
    {
        double d=3255.65658;
        cout<<d<<"  size=  ";
        cout<<sizeof(d)<<'\n';
        cout<<"size of double = "<<sizeof(double)<<'\n';
    }
    void longdoublefun()
    {
        long double lb=43254.8788;
        cout<<lb<<"  size=  ";
        cout<<sizeof(lb)<<'\n';
        cout<<"size of long double = "<<sizeof(long double)<<'\n';
    }
    void widecharfun()
    {
        wchar_t ch=L'\0';
        cout<<ch<<"  size=  ";
        cout<<sizeof(ch)<<'\n';
        cout<<"size of wide character = "<<sizeof(wchar_t)<<'\n';
    }

int main()
{
    intfun();
    charfun ();
    boolfun ();
    shortfun();
    floatfun();
    longfun();
    doublefun();
    longdoublefun();
    widecharfun();
    return 0;
}

```

## Output

```
(sammei㉿kali)-[~/Desktop/sammei/practical 5 c++]
$ g++ t2.cpp
(sammei㉿kali)-[~/Desktop/sammei/practical 5 c++]
$ ./a.out
5657865  size= 4
size of int = 4
b  size= 1
size of character = 1
1  size= 1
size of boolean = 1
100  size= 2
size of short int = 2
12.6474  size= 4
size of float = 4
64579745756  size= 8
size of long int = 8
3255.66  size= 8
size of double = 8
43254.9  size= 16
size of long double = 16
65  size= 4
size of wide character = 4
```

## Practical 6

### Task 1

#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    int a=10;
    string s="Vaibhav";
    float f=10.56;
    //cout<<"Integer+Integer:- "<<a+a<<"\n";
    //cout<<"String + String:- "<<s+s<<"\n";
    //cout<<"Float+Float:- "<<f+f<<"\n";
    //cout<<"Integer+Float:- "<<a+f<<"\n";
    cout<<"Integer+String:- "<<a+s<<"\n";
    return 0;
}
```

#### Output

```
student@lab8pc-28: ~/Desktop/200111163
student@lab8pc-28:~/Desktop/200111163$ g++ t1.cpp
student@lab8pc-28:~/Desktop/200111163$ ./a.out
Integer+Integer:- 20
student@lab8pc-28:~/Desktop/200111163$ g++ t1.cpp
student@lab8pc-28:~/Desktop/200111163$ ./a.out
String + String:- VaibhavVaibhav
student@lab8pc-28:~/Desktop/200111163$ g++ t1.cpp
student@lab8pc-28:~/Desktop/200111163$ ./a.out
Float+Float:- 21.12
student@lab8pc-28:~/Desktop/200111163$ g++ t1.cpp
student@lab8pc-28:~/Desktop/200111163$ ./a.out
Integer+Float:- 20.56
student@lab8pc-28:~/Desktop/200111163$ g++ t1.cpp
t1.cpp: In function 'int main()':
t1.cpp:14:30: error: no match for 'operator+' (operand types are 'int' and 'std::__cxx11::string {aka std::__cxx11::basic_string<char>}')
        cout<<"Integer+String:- "<<a+s<<"\n";
                                         ^
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 t1.cpp:1:
/usr/include/c++/5/bits/stl_iterator.h:334:5: note: candidate: template<class _Iterator> std::reverse_iterator<_Iterator> std::operator+(typename std::reverse_iterator<_Iterator>::difference_type, const std::reverse_iterator<_Iterator>&)
          operator+(typename reverse_iterator<_Iterator>::difference_type __n,
                     ^
/usr/include/c++/5/bits/stl_iterator.h:334:5: note:   template argument deduction/substitution failed:
t1.cpp:14:31: note:   'std::__cxx11::string {aka std::__cxx11::basic_string<char>}' is not derived from 'const std::reverse_iterator<_Iterator>'
        cout<<"Integer+String:- "<<a+s<<"\n";
```

## Practical 6

### Task 2

#### Source Code:

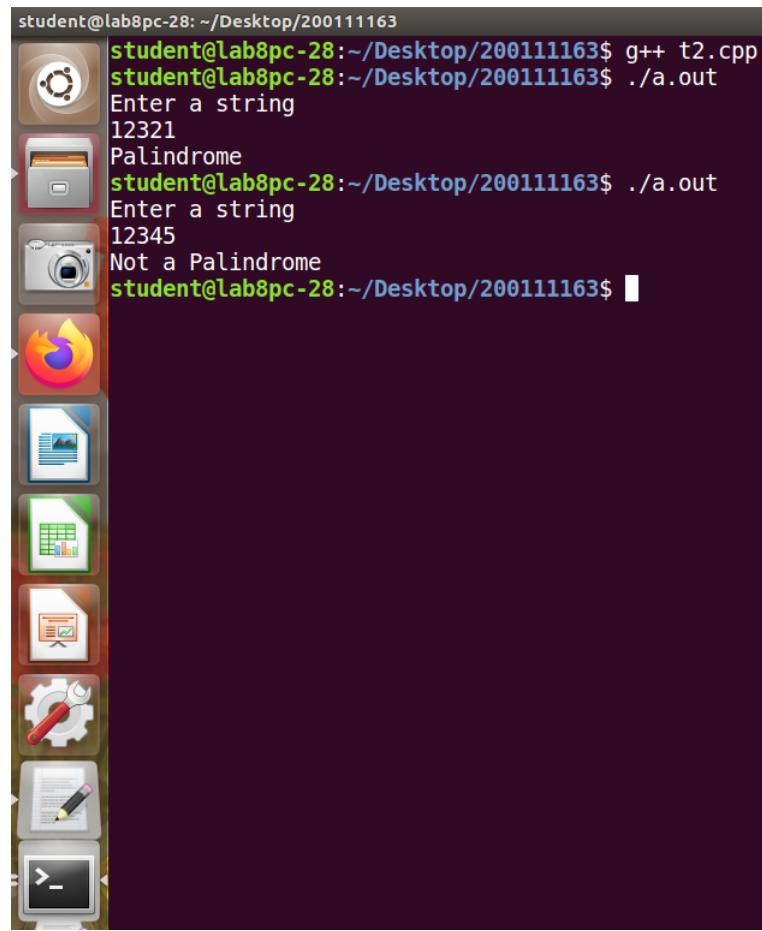
```
#include
<iostream>
#include <string>

using namespace std;

int main()
{
    string s,temp;
    cout<<"Enter a string\n";
    getline(cin,s);
    int l=0,i;
    l=s.length();
    for(i=l-1;i>=0;i--)
    {
        temp=temp+s[i];
    }
    if(temp==s)
        cout<<"Palindrome\n";
    else
        cout<<"Not a Palindrome\n";
    return 0;
}
```

## Output

```
student@lab8pc-28:~/Desktop/200111163$ g++ t2.cpp
student@lab8pc-28:~/Desktop/200111163$ ./a.out
Enter a string
12321
Palindrome
student@lab8pc-28:~/Desktop/200111163$ ./a.out
Enter a string
12345
Not a Palindrome
student@lab8pc-28:~/Desktop/200111163$
```



## Practical 6

### Task 3

#### Source Code:

```
#include
<iostream>

#include <string>
#include <bits/stdc++.h>

using namespace std;

void reverse(string s)
{
    string temp1;
    int l=0,i;
    l=s.length();
    for(i=l-1;i>=0;i--)
    {
        temp1=temp1+s[i];
    }
    cout<<"Reversed String using manual function:- "<<temp1<<"\n";
}

int main()
{
    string s;
    cout<<"Enter a string\n";
    getline(cin,s);
    reverse(s);
    reverse(s.begin(),s.end());
    cout<<"Reversed String using inbuilt function:- "<<s<<"\n";
    return 0;
}
```

## Output

```
student@lab8pc-28: ~/Desktop/200111163
student@lab8pc-28:~/Desktop/200111163$ g++ t3.cpp
student@lab8pc-28:~/Desktop/200111163$ ./a.out
Enter a string
Hello World
Reversed String using manual function:- dlroW olleH
Reversed String using inbuilt function:- dlroW olleH
student@lab8pc-28:~/Desktop/200111163$
```

## Practical 6

### Task 4

#### Source Code:

```
#include
<iostream>
#include <bits/stdc++.h>

using namespace std;
int compare(string s1, string s2)
{
    int l1=s1.length();
    int l2=s2.length();
    if(l1==l2)
    {
        for(int i=0;i<l1;i++)
        {
            if(s1[i]!=s2[i])
                return 0;
        }
        return 1;
    }
    else
        return 0;
}
int main()
{
    string s1,s2;
    cout<<"Enter any two strings:- \n";
    getline(cin,s1);
    getline(cin,s2);
    int c=compare(s1,s2);
    if(c==0)
        cout<<"Strings are not equal\n";
    else
        cout<<"Strings are equals\n";
    return 0;
}
```

## Output

```

File Actions Edit View Help
File   Actions   Edit   View   Help
( sammei@kali )-[ ~/Desktop/sammei/practical 6 c++ ]
$ g++ t4.cpp
( sammei@kali )-[ ~/Desktop/sammei/practical 6 c++ ]
$ ./a.out
Enter any two strings:-
abc
abc
Strings are equals

( sammei@kali )-[ ~/Desktop/sammei/practical 6 c++ ]
$ ./a.out
Enter any two strings:-
abc
abd
Strings are not equal

( sammei@kali )-[ ~/Desktop/sammei/practical 6 c++ ]
$ ./a.out
Enter any two strings:-
Vaibhav
vaibhav
Strings are not equal

( sammei@kali )-[ ~/Desktop/sammei/practical 6 c++ ]
$ ./a.out
Enter any two strings:-
2001
2001
Strings are equals

( sammei@kali )-[ ~/Desktop/sammei/practical 6 c++ ]
$ 

```

## Practical 6

### Task 5

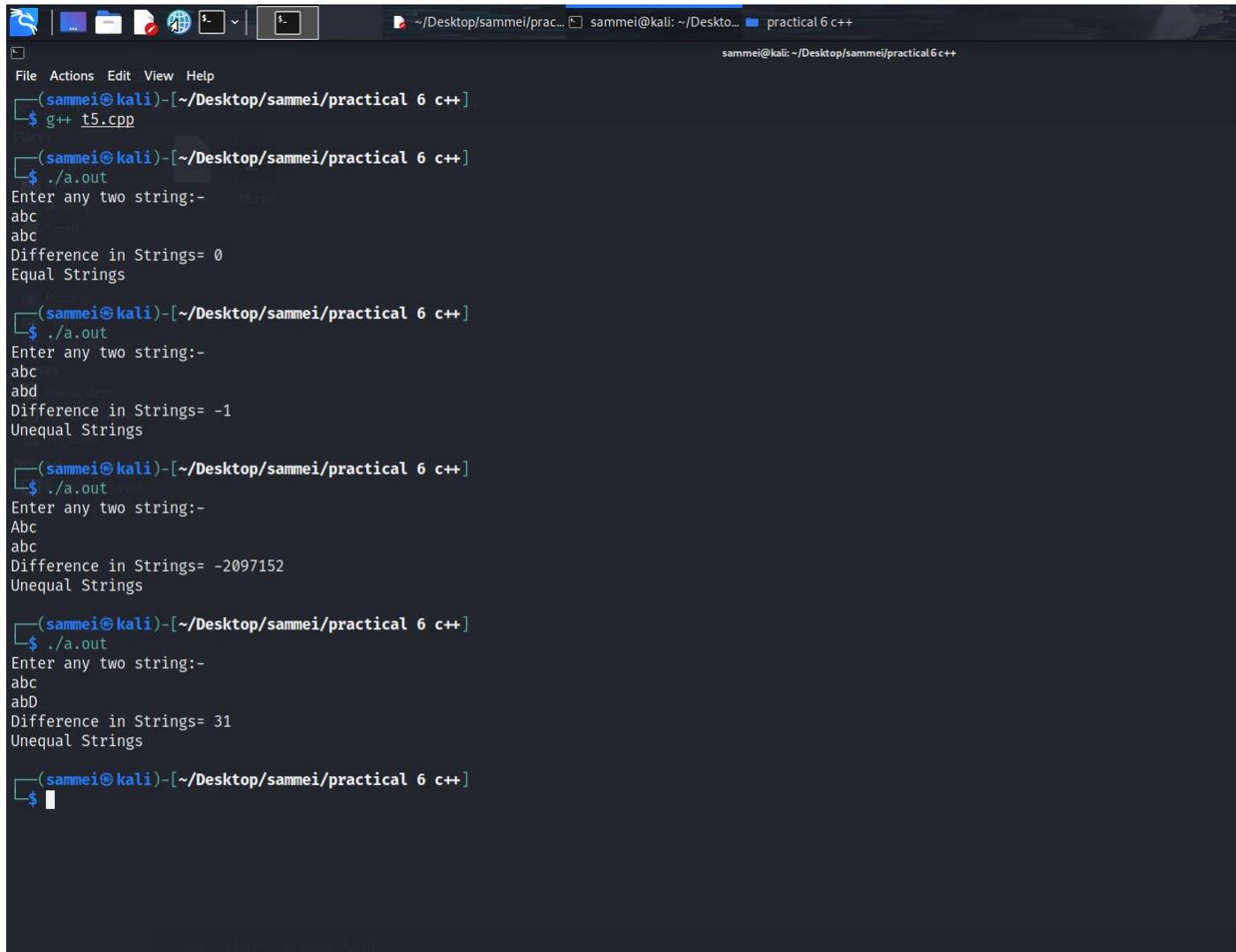
#### Source Code:

```
# include
<iostream>
# include <string>

using namespace std;

int main()
{
    string s1,s2;
    cout<<"Enter any two string:-\n";
    getline(cin,s1);
    getline(cin,s2);
    int x= s1.compare(s2);
    cout<<"Difference in Strings= "<<x<<"\n";
    if(x==0)
        cout<<"Equal Strings\n";
    else
        cout<<"Unequal Strings\n";
    return 0;
}
```

## Output



```

File Actions Edit View Help
File Actions Edit View Help
(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ g++ t5.cpp
(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ ./a.out
Enter any two string:-
abc
abc
Difference in Strings= 0
Equal Strings

(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ ./a.out
Enter any two string:-
abc
abd
Difference in Strings= -1
Unequal Strings

(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ ./a.out
Enter any two string:-
Abc
abc
Difference in Strings= -2097152
Unequal Strings

(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ ./a.out
Enter any two string:-
abc
abD
Difference in Strings= 31
Unequal Strings

(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ 

```

## Practical 6

### Task 6

#### Source Code:

```
#include
<iostream>

#include <string>

using namespace std;

int main()
{
    string s;
    char c;
    int i;
    cout<<"Enter a String:-\n";
    getline(cin,s);
    cout<<"Enter a character to replace in string:- \n";
    cin>>c;
    cout<<"Enter the index to repalce in String:-\n";
    cin>>i;
    cout<<"Address of String before change:- "<<&s<<"\n";
    s[i]=c;
    cout<<"String after change:- "<<s<<"\n";
    cout<<"Address of String After change:- "<<&s<<"\n";
    return 0;
}
```

## Output

The screenshot shows a terminal window on a Kali Linux desktop environment. The terminal title is 'practical 6 c++'. The session starts with the command \$ g++ t6.cpp, followed by the execution of the compiled program \$ ./a.out. The program prompts for a string ('Enter a String:-'), which is entered as 'Vaibhav'. It then asks for a character to replace ('Enter a character to replace in string:-') and 'h' is chosen. Next, it asks for the index to replace ('Enter the index to repalce in String:-') and '3' is entered. The program outputs the address of the string before change (0x7ffcb2847450), the modified string ('Vaihhav'), and the address of the string after change (0x7ffcb2847450). This process is repeated for another string 'abc', where 'a' is replaced by 'aac' at index 1.

```
(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ g++ t6.cpp
(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ ./a.out
Enter a String:-
Vaibhav
Enter a character to replace in string:-
h
Enter the index to repalce in String:-
3
Address of String before change:- 0x7ffcb2847450
String after change:- Vaihhav
Address of String After change:- 0x7ffcb2847450

(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$ ./a.out
Enter a String:-
abc
Enter a character to replace in string:-
a
Enter the index to repalce in String:-
1
Address of String before change:- 0x7ffc25b7d9b0
String after change:- aac
Address of String After change:- 0x7ffc25b7d9b0

(sammei㉿kali)-[~/Desktop/sammei/practical 6 c++]
$
```

## Practical 7

### Task 1

#### Source Code:

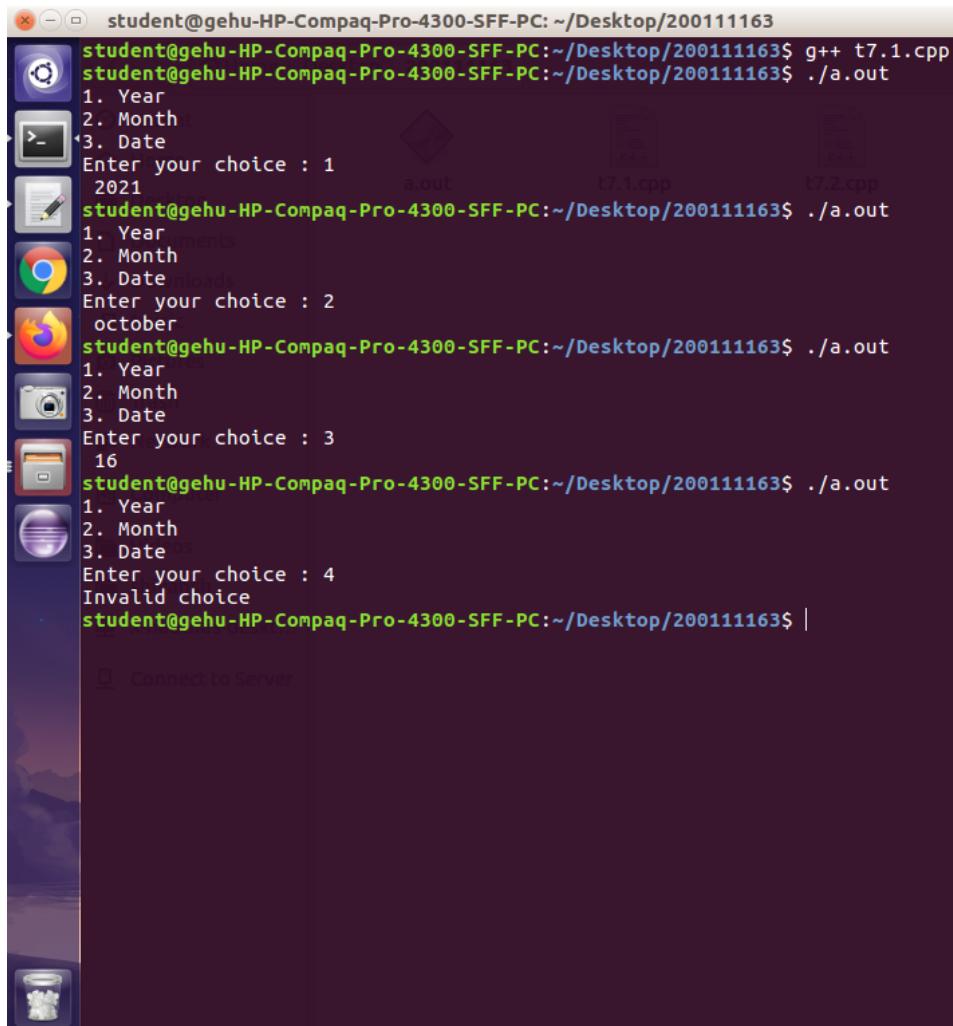
```
#include
<iostream>

#include <string>
using namespace std;
int main()
{
    int yr,ch;
    string month="october";
    int date=16;
    yr=2021;
    cout<<"1. Year\n";
    cout<<"2. Month\n";
    cout<<"3. Date\n";
    cout<<"Enter your choice : ";
    cin>>ch;

    switch(ch)
    {

        case 1:
            cout<<" "<<yr<<"\n";
            break;
        case 2:
            cout<<" "<<month<<"\n";
            break;
        case 3:
            cout<<" "<<date<<"\n";
            break;
        default:
            cout<<"Invalid choice\n";
            break;
    }
    return 0;
}
```

## Output



A screenshot of a Linux desktop environment. On the left is a vertical dock containing icons for various applications like a terminal, file manager, and system tools. The main area shows a terminal window with the following text:

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163$ g++ t7.1.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
1. Year
2. Month
3. Date
Enter your choice : 1
2021
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
1. Year
2. Month
3. Date
Enter your choice : 2
october
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
1. Year
2. Month
3. Date
Enter your choice : 3
16
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
1. Year
2. Month
3. Date
Enter your choice : 4
Invalid choice
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

## Practical 7

### Task 2

#### Source Code:

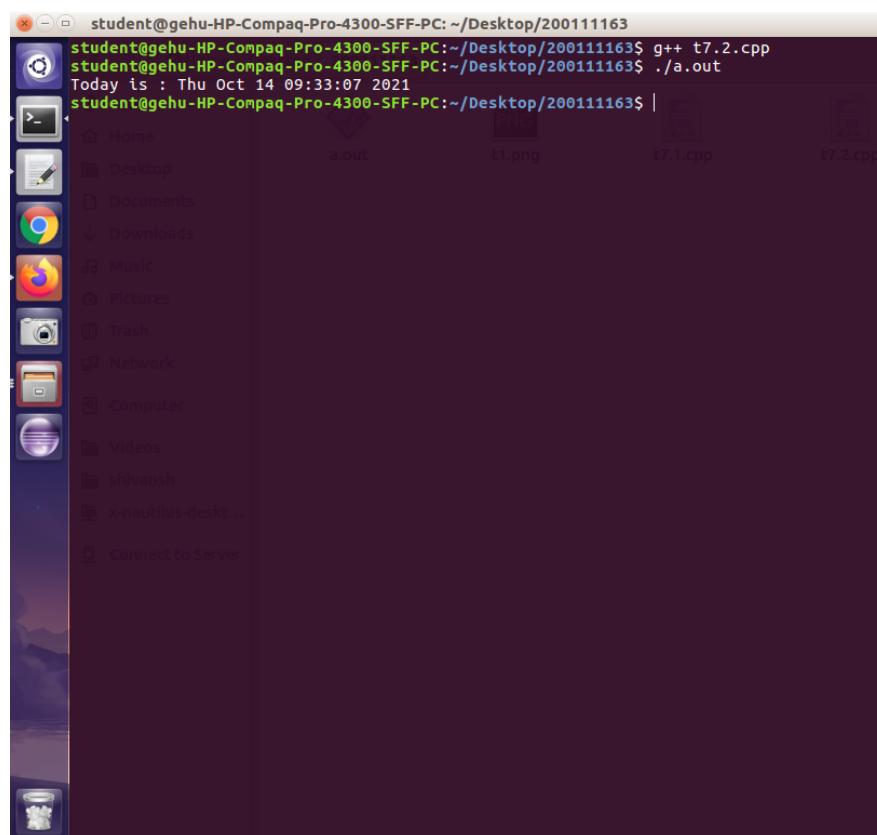
```
#include
<iostream>

#include <ctime>
using namespace std;
int main()
{
    time_t current_time;
    current_time = time(NULL);

    char *tm = ctime(&current_time);
    cout << "Today is : " << tm;

    return 0;
}
```

#### Output



```
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ t7.2.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
Today is : Thu Oct 14 09:33:07 2021
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

## Practical 7

### Task 3 V1

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"Reversed Array is :-\n";
    for(i=n-1;i>=0;i--)
    {
        for(j=n-1;j>=0;j--)
        {
            cout<<a[i][j]<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window titled "student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163". The terminal displays the following command-line session:

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ t3.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
Enter size of the array:-
3
Enter the elements of the array
1 2 3
4 5 6
7 8 9
Reversed Array is :-
9 8 7
6 5 4
3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

The terminal window is located on a desktop environment with a dark purple background. To the right of the terminal, there are several icons for files and folders, including "t1.png", "t2.png", "t3.cpp", and "t7.1.cpp". On the left side of the terminal, there is a vertical dock containing icons for various applications like a terminal, file manager, and system settings.

## Practical 7

### Task 3 V2

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"Reversed Array is :-\n";
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            cout<<10-a[i][j]<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window on a Linux desktop environment. The terminal output is as follows:

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163$ g++ t3_2.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163$ ./a.out
Enter size of the array:-
3
Enter the elements of the array
1 2 3
4 5 6
7 8 9
Reversed Array is :-
9 8 7
6 5 4
3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163$ |
```

The terminal window is titled "student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163\$". It shows the command `g++ t3_2.cpp` being run, followed by the execution of the resulting binary `./a.out`. The user is prompted to enter the size of the array (3), and then the elements (1 2 3, 4 5 6, 7 8 9). The program then outputs the reversed array (9 8 7, 6 5 4, 3 2 1).

## Practical 7

### Task 3 V3

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n],b[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"Reversed Array is :-\n";
    for(i=n-1;i>=0;i--)
    {
        for(j=n-1;j>=0;j--)
        {
            b[n-i-1][n-j-1]=a[i][j];
        }
    }
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cout<<b[i][j]<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window titled "student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163". The user has run the command `g++ t3_3.cpp` to compile the program, and then executed the resulting binary `a.out`. The program prompts for the size of the array (3) and then asks for the elements (1 2 3 4 5 6 7 8 9). It then displays the reversed array (9 8 7 6 5 4 3 2 1).

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ t3_3.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
Enter size of the array:-
3
*Enter the elements of the array
1 2 3 4 5 6 7 8 9
Reversed Array is :-
9 8 7 6 5 4 3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

## Practical 7

### Task 3 V4

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n],b[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"Reversed Array is :-\n";
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            b[i][j]=10-a[i][j];
        }
    }
    for(i=0;i<3;i++)
    {
        for(j=0;j<3;j++)
        {
            cout<<b[i][j]<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window titled "student@gehu-HP-Compaq-Pro-4300-SFF-PC: ~/Desktop/200111163". The user has run the command "g++ t3\_4.cpp" to compile a C++ program named "t3\_4.cpp". After compilation, they run the executable "a.out". The program prompts for the size of the array, which is entered as 3. It then asks for the elements of the array, and the user enters 1 2 3. The program outputs the reversed array: 3 2 1.

```
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ g++ t3_4.cpp
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ ./a.out
Enter size of the array:-
3
Enter the elements of the array
1 2 3
4 5 6
7 8 9
Reversed Array is :-
9 8 7
6 5 4
3 2 1
student@gehu-HP-Compaq-Pro-4300-SFF-PC:~/Desktop/200111163$ |
```

## Practical 7

### Task 4 V1

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n],b[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"New matrix is:\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cout<<a[0][i]<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window on a Kali Linux desktop environment. The terminal title is '(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]'. The user has run the command 'g++ t4\_1.cpp' to compile the source code. After compilation, they run the executable with './a.out'. The program prompts for the size of the array, which is entered as 3. It then asks for the elements of the array, which are input as:

```
1 2 3  
4 5 6  
7 8 9
```

The program outputs the new matrix:

```
1 1 1  
2 2 2  
3 3 3
```

## Practical 7

### Task 4 V2

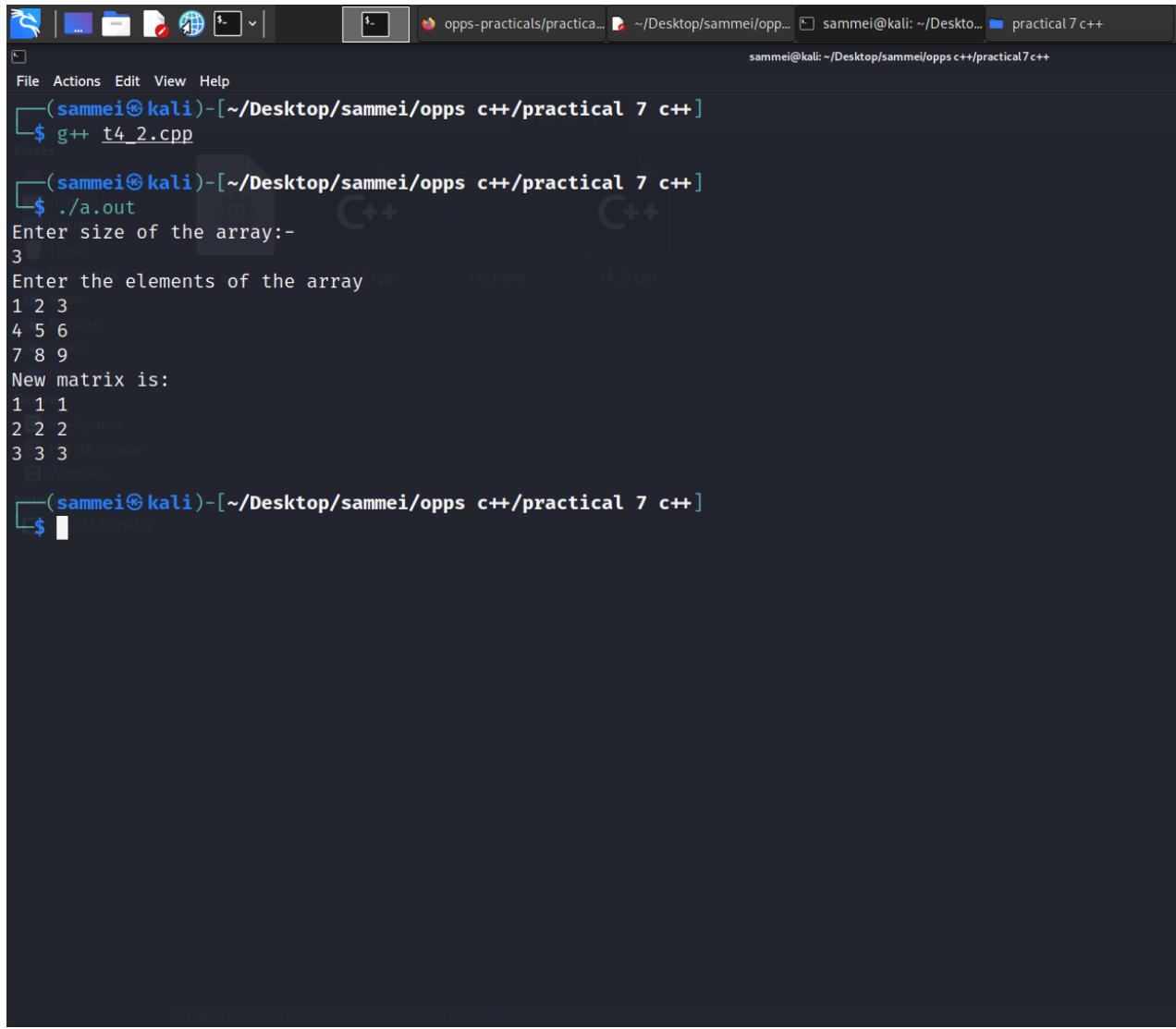
#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n],b[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"New matrix is:\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cout<<a[i][n-1]/3<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output



```
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ g++ t4_2.cpp
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ ./a.out
Enter size of the array:-
3
Enter the elements of the array
1 2 3
4 5 6
7 8 9
New matrix is:
1 1 1
2 2 2
3 3 3
```

## Practical 7

### Task 4 V3

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    int a[n][n],b[n][n];
    cout<<"Enter the elements of the array\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cin>>a[i][j];
        }
    }
    cout<<"New matrix is:\n";
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cout<<a[i][j]-(2*i+j)<<" ";
        }
        cout<<"\n";
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window titled "qterminal" with the command line "sammei@kali: ~/Desktop/sammei/oppss c++/practical 7 c++". The terminal displays the following session:

```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 7 c++]
$ g++ t4_3.cpp

(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 7 c++]
$ ./a.out
Enter size of the array:-
3
Enter the elements of the array
1 2 3
4 5 6
7 8 9
New matrix is:
1 1 1
2 2 2
3 3 3
```

## Practical 7

### Task 5

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    char a[n][n];
    for(i=0;i<n;i++)
    {
        for(j=0;j<=i;j++)
        {
            a[i][j]='*';
        }
    }
    for(i=0;i<n;i++)
    {
        for(j=0;j<=i;j++)
        {
            cout<<a[i][j]<<" ";
        }
        cout<<'\n';
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a menu bar with 'File', 'Actions', 'Edit', 'View', and 'Help'. Below the menu, the terminal prompt is '(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]'. The user runs the command '\$ g++ t5.cpp' followed by '\$ ./a.out'. The program asks 'Enter size of the array:-' and the user inputs '4'. The terminal then displays the output of the program, which consists of four asterisks (\*). The terminal window has a title bar with the same path and a status bar at the bottom showing 'sammei@kali: ~/Desktop/sammei/opp... practical 7 c++'.

```
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ g++ t5.cpp
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ ./a.out
Enter size of the array:-
4
*****
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$
```

## Practical 7

### Task 6

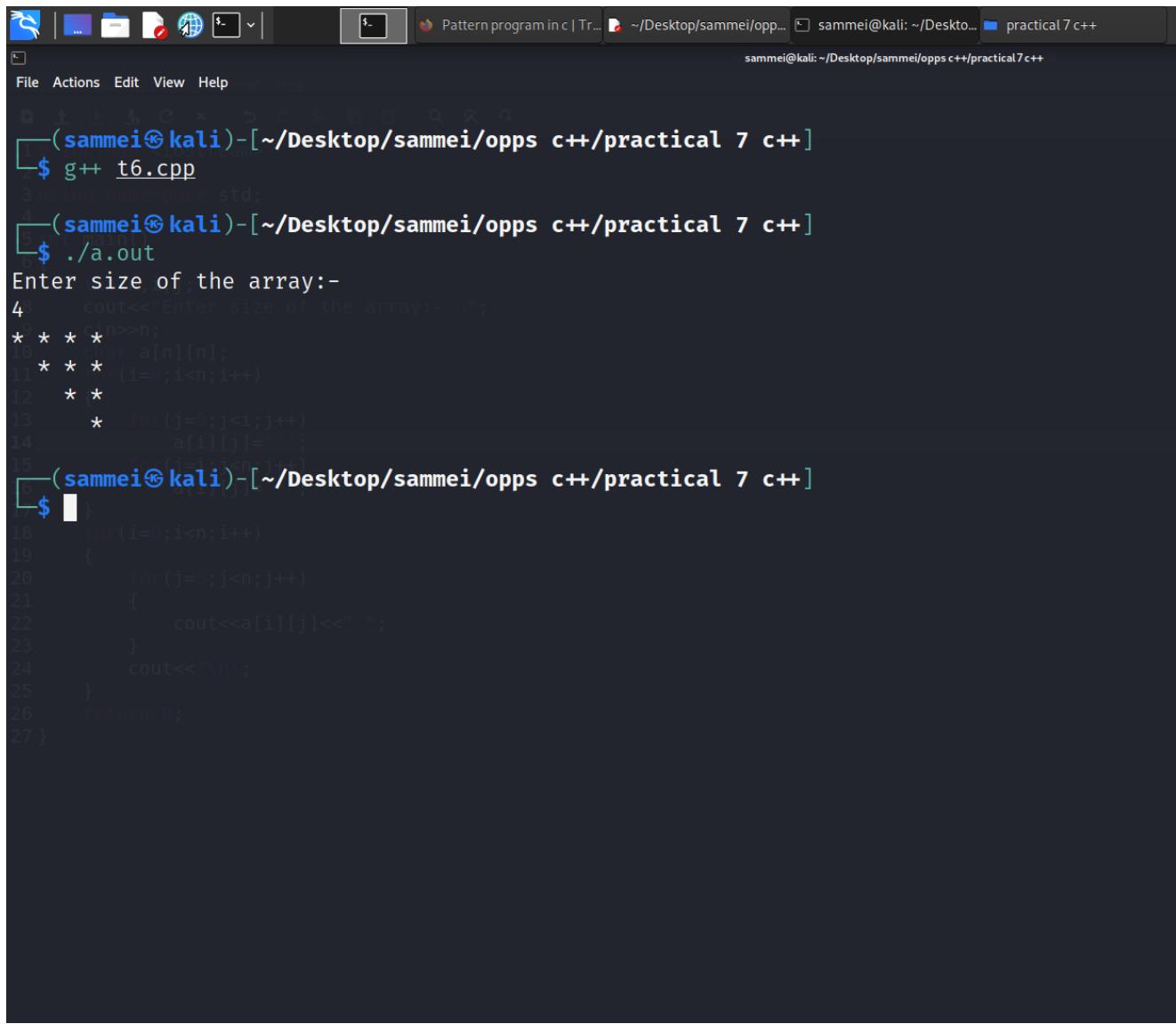
#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    char a[n][n];
    for(i=0;i<n;i++)
    {
        for(j=0;j<i;j++)
            a[i][j]=' ';
        for(j=i;j<n;j++)
            a[i][j]='*';
    }
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cout<<a[i][j]<<" ";
        }
        cout<<'\n';
    }
    return 0;
}
```

## Output



```

Pattern program in c | Tr...
~/Desktop/sammei/opp... sammei@kali: ~/Desktop/sammei/opp... practical 7 c++
sammei@kali: ~/Desktop/sammei/opp... practical 7 c++

File Actions Edit View Help

(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ g++ t6.cpp
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ ./a.out
Enter size of the array:-
4
    cout<<"Enter size of the array:-\n";
* * *
10     char a[n][n];
11     for(i=0;i<n;i++)
12     {
13         for(j=0;j<i;j++)
14             a[i][j]=0;
15         a[i][i]=1;
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 7 c++]
$ []
17     for(i=0;i<n;i++)
18     {
19         for(j=0;j<n;j++)
20         {
21             cout<<a[i][j]<<" ";
22         }
23         cout<<'\n';
24     }
25 }
26 return 0;
27 }


```

## Practical 7

### Task 7

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    char a[n][n];
    for(i=0;i<n;i++)
    {
        for(j=0;j<(n-i-1);j++)
            a[i][j]=' ';
        for(j=n-1;j>=(n-i-1);j--)
            a[i][j]='*';
    }
    for(i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            cout<<a[i][j]<<" ";
        }
        cout<<'\n';
    }
    return 0;
}
```

## Output

```

Pattern program in c | Tr...
~/Desktop/sammei/opp... sammei@kali: ~/Desktop/practical 7 c++
sammei@kali: ~/Desktop/sammei/opp... practical 7 c++

File Actions Edit View Help

( sammei@kali )-[ ~/Desktop/sammei/opp... c++/practical 7 c++ ]
$ g++ t7.cpp
( sammei@kali )-[ ~/Desktop/sammei/opp... c++/practical 7 c++ ]
$ ./a.out
Enter size of the array:-
4
    cout<<"Enter size of the array:- ";
5     cin>>n;
6     * * * a[n][n];
7     * * ( i=0; i<n; i++ )
8     * * *   * ( j=0; j<(n-i-1); j++ )
9     * * *   a[i][j]= ' ';
10    * * ( j=n-1; j>=(n-i-1); j-- )
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27 }

( sammei@kali )-[ ~/Desktop/sammei/opp... c++/practical 7 c++ ]
$ [ (1=0; i<n; i++)
{
    * (j=0; j<n; j++)
    {
        cout<<a[i][j]<<" ";
    }
    cout<<'\n';
}
return 0;
}

```

## Practical 7

### Task 8

#### Source Code:

```
# include
<iostream>

using namespace std;

int main()
{
    int n,i,j;
    cout<<"Enter size of the array:-\n";
    cin>>n;
    char a[n][n];
    for(i=n-1;i>=0;i--)
    {
        for(j=i;j>=0;j--)
        {
            a[i][j]='*';
        }
    }
    for(i=n-1;i>=0;i--)
    {
        for(j=i;j>=0;j--)
        {
            cout<<a[i][j]<<" ";
        }
        cout<<'\n';
    }
    return 0;
}
```

## Output

The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a menu bar with 'File', 'Actions', 'Edit', 'View', and 'Help'. Below the menu, the terminal prompt is '(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 7 c++]'. The user runs the command '\$ g++ t8.cpp' followed by '\$ ./a.out'. The program asks 'Enter size of the array:-' and the user inputs '4'. The output shows four asterisks (\* \* \* \*) representing the elements of the array.

```
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 7 c++]
$ g++ t8.cpp
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 7 c++]
$ ./a.out
Enter size of the array:-
4
* * * *
```

## Practical 8

### Task 1

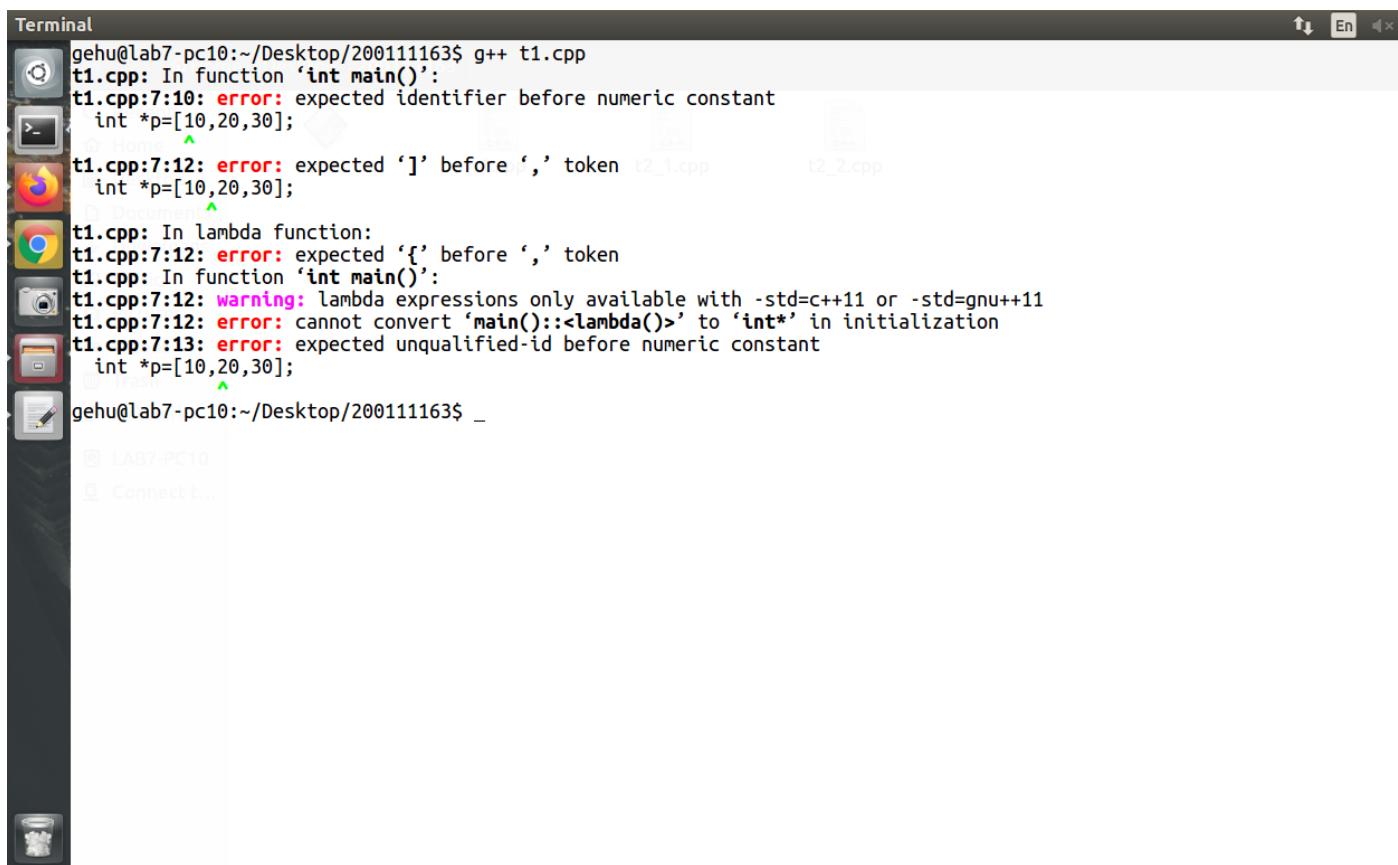
#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    int *p=[10,20,30];
    cout<<*p;
    p++;
    cout<<(*p);
    return 0;
}
```

#### Output



The screenshot shows a terminal window with the following output:

```
gehu@lab7-PC10:~/Desktop/200111163$ g++ t1.cpp
t1.cpp: In function 'int main()':
t1.cpp:7:10: error: expected identifier before numeric constant
  int *p=[10,20,30];
           ^
t1.cpp:7:12: error: expected ']' before ',' token
  int *p=[10,20,30];
           ^
t1.cpp: In lambda function:
t1.cpp:7:12: error: expected '{' before ',' token
t1.cpp: In function 'int main()':
t1.cpp:7:12: warning: lambda expressions only available with -std=c++11 or -std=gnu++11
t1.cpp:7:12: error: cannot convert 'main()::<lambda()>' to 'int*' in initialization
t1.cpp:7:13: error: expected unqualified-id before numeric constant
  int *p=[10,20,30];
           ^
gehu@lab7-PC10:~/Desktop/200111163$ _
```

## Practical 8

### Task 2 V1

#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    int arr[]={10,20,30};
    int *p;
    p=&arr;
    cout<<*p<<"\n";
    p++;
    cout<<*p<<"\n";
    return 0;
}
```

#### Output

The screenshot shows a Linux desktop environment. On the left is a vertical dock containing icons for a terminal, file manager, browser, and other applications. The main area has a file manager window open with a dark theme. Inside the file manager, there are several files and folders: 't2\_2.cpp' (highlighted), 't1.cpp', 't2\_1.cpp', 't2\_1.png', and 't2\_2.cpp'. In the background, a terminal window is visible with the following text:

```
gehu@lab7-PC10:~/Desktop/200111163$ g++ t2_2.cpp
t2_2.cpp: In function 'int main()':
t2_2.cpp:9:3: error: cannot convert 'int (*)[3]' to 'int*' in assignment
  p=&arr;
```

## Practical 8

### Task 2 V2

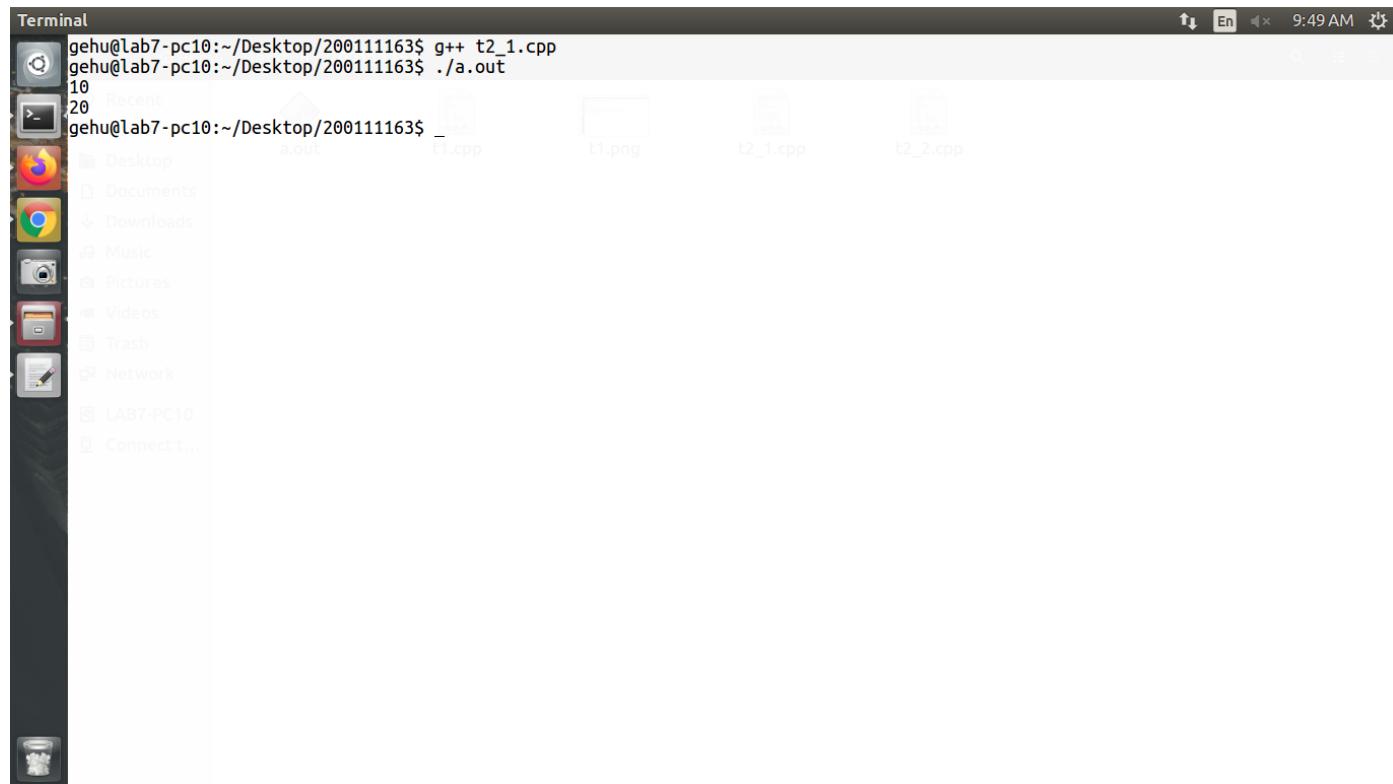
#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    int arr[]={10,20,30};
    int *p;
    p=arr;
    cout<<*p<<"\n";
    p++;
    cout<<*p<<"\n";
    return 0;
}
```

#### Output



The screenshot shows a Linux desktop environment with a dark theme. On the left is a vertical dock containing icons for a terminal, file manager, browser, and other applications. The main area features a terminal window titled 'Terminal' with the following content:

```
gehu@lab7-pc10:~/Desktop/200111163$ g++ t2_1.cpp
gehu@lab7-pc10:~/Desktop/200111163$ ./a.out
10
20
```

Next to the terminal are several files: 't1.png', 't1.cpp', 't2\_1.cpp', and 't2\_2.cpp'. The desktop background is a light blue gradient.

## Practical 8

### Task 3 V1

#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    int a=30;
    int *p;
    p=&a;
    int **q;
    q=&p;
    cout<<*p<<"\n";
    cout<<**q<<"\n";
    return 0;
}
```

#### Output

```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ g++ t3_1.cpp
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ ./a.out
30
30
$
```

## Practical 8

### Task 3 V2

#### Source Code:

```
#include
<iostream>

using namespace std;

int main()
{
    int a=30;
    int *p;
    p=&a;
    int **q;
    q=&p;
    cout<<**q<<"\n";
    **q=20;
    cout<<**q<<"\n";
    return 0;
}
```

#### Output

```
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 8 c++]
$ g++ t3_2.cpp
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 8 c++]
$ ./a.out
30
20
```

## Practical 8

### Task 4

#### Source Code:

```
#include
<iostream>

using namespace std;

void fac(int n)
{
    int f=1,i;
    for(i=n;i>0;i--)
        f=f*i;
    cout<<"Factorial of "<<n<<":- "<<f<<"\n";
}
int main()
{
    cout<<"Enter the no. to calculate factorial:\n";
    int n;
    cin>>n;
    fac(n);
    return 0;
}
```

## Output

The screenshot shows a Linux desktop environment with a dark theme. On the left is a vertical dock containing icons for a terminal, a browser, a file manager, and other system tools. The main area has two windows open: a terminal window titled "Terminal" and a file manager window titled "Desktop".

**Terminal Window Content:**

```
gehu@lab7-PC10:~/Desktop/200111163$ g++ t4.cpp
gehu@lab7-PC10:~/Desktop/200111163$ ./a.out
Enter the no. to calculate factorial:
5
Factorial of 5:-120
gehu@lab7-PC10:~/Desktop/200111163$ t1.cpp
```

**File Manager Window Content:**

- Documents
- Downloads
- Music
- Pictures
- Videos
- Trash
- Network
- LAB7-PC10
- Connect to...

On the desktop, there are several files and folders represented by icons: t1.cpp, t3.cpp, t3.png, t4.cpp, t1.png, t2\_1.cpp, and t2\_1.png.

## Practical 8

### Task 5

#### Source Code:

```
#include
<iostream>

using namespace std;

int fac(int n)
{
    if(n==0)
        return 1;
    else
        return (n*fac(n-1));
}

int main()
{
    cout<<"Enter the no. to calculate factorial:\n";
    int n,f=0;
    cin>>n;
    f=fac(n);
    cout<<"Factorial of "<<n<<":- "<<f<<"\n";
    return 0;
}
```

## Output

The screenshot shows a Linux desktop environment with a dark theme. On the left is a vertical dock containing icons for various applications like a terminal, file manager, and system tools. The main area features a terminal window titled "Terminal" with the following text:

```
gehu@lab7-PC10:~/Desktop/200111163$ g++ t5.cpp
gehu@lab7-PC10:~/Desktop/200111163$ ./a.out
Enter the no. to calculate factorial:
5
Factorial of 5:-120
gehu@lab7-PC10:~/Desktop/200111163$
```

Below the terminal, there are several icons representing files and folders, including "t1.cpp", "t1.png", "t2\_1.cpp", "t2\_1.png", "t3.cpp", "t3.png", "t4.cpp", "t4.png", and "t5.cpp".

## Practical 8

### Task 6

#### Source Code:

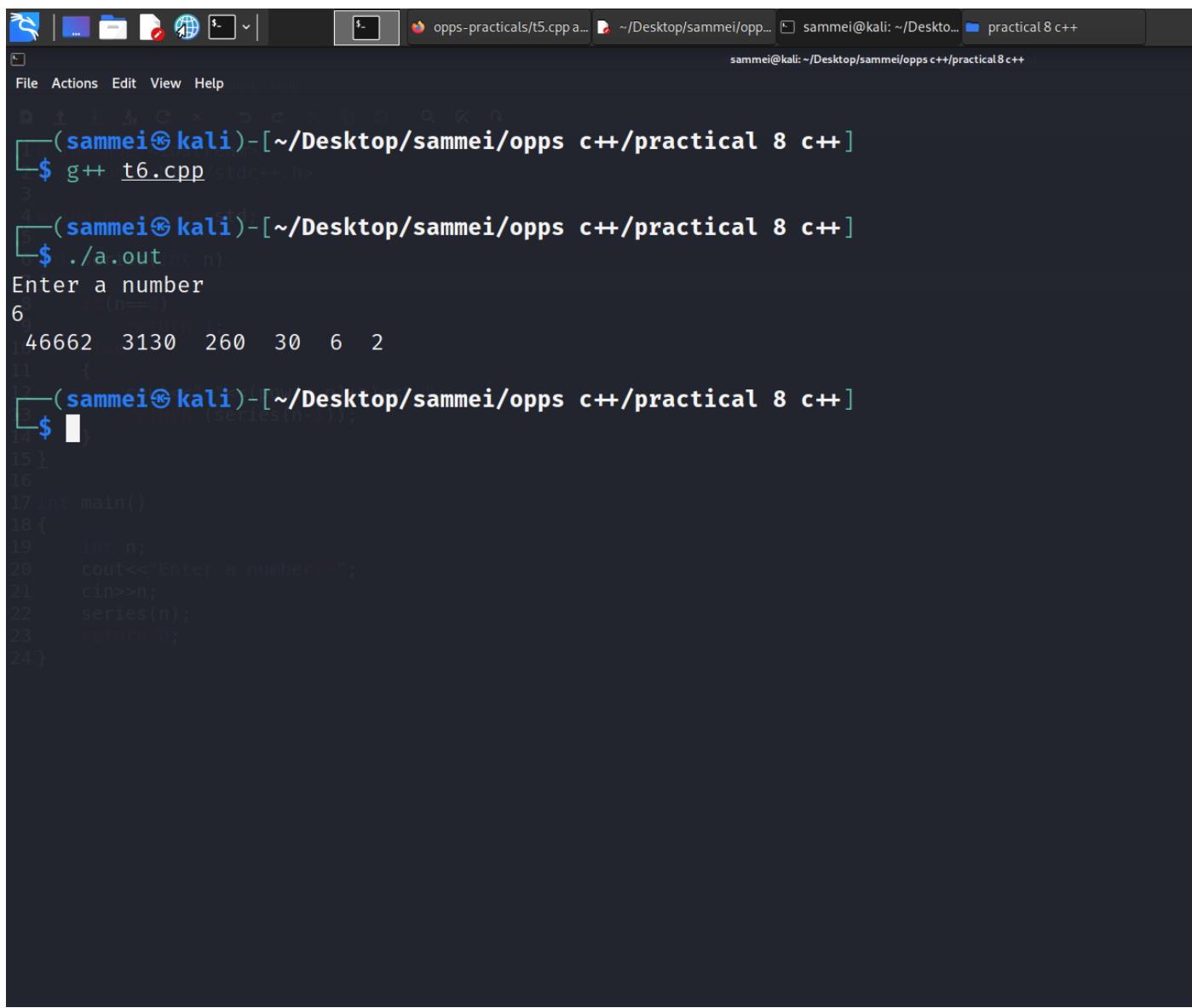
```
# include
<iostream>
# include <bits/stdc++.h>

using namespace std;

int series(int n)
{
    if(n==0)
        return 1;
    else
    {
        cout<<" "<<(pow(n,n)+n)<<" ";
        return (series(n-1));
    }
}

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

## Output



```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ g++ t6.cpp
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ ./a.out
Enter a number
6
46662 3130 260 30 6 2
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ 
```

The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a toolbar with icons for file operations like copy, paste, and save. The title bar indicates the current directory is `~/Desktop/sammei/oppss c++/practical 8 c++`. The terminal prompt is `$`. The user runs the command `g++ t6.cpp` to compile the program. After compilation, they run the executable `./a.out`. The program asks for a number, which the user inputs as `6`. The output is a series of integers: `46662 3130 260 30 6 2`. The terminal then returns to the prompt. Below the terminal window, the source code of the `t6.cpp` file is displayed. It contains a single `main` function that prompts the user for a number, calls a `series` function, and then returns 0.

```
1 // Series of numbers
2 // Author: Vaibhav Kumar Kapriyal
3 // Roll No.: 2018837
4 // Section-A
5
6 #include <iostream>
7
8 using namespace std;
9
10 int series(int n)
11 {
12     if (n == 0)
13         return 0;
14     else
15         return n + series(n - 1);
16 }
17
18 int main()
19 {
20     int n;
21     cout << "Enter a number: ";
22     cin >> n;
23     series(n);
24 }
```

## Practical 8

### Task 7 V1

#### Source Code:

```
#include
<iostream>

using namespace std;

void swap(int a,int b)
{
    int t;
    t=a;
    a=b;
    b=t;
}

int main()
{
    int a,b;
    cout<<"Enter the values of a & b\n";
    cin>>a;
    cin>>b;
    cout<<"Value of a & b before calling swap function\n";
    cout<<a<<'\n';
    cout<<b<<'\n';
    swap(a,b);
    cout<<"Value of a & b after calling swap function\n";
    cout<<a<<'\n';
    cout<<b<<'\n';
    return 0;
}
```

## Output

```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ g++ t7_1.cpp
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ ./a.out int a,int b)
Enter the values of a & b
10
20
Value of a & b before calling swap function
10
20
Value of a & b after calling swap function
10{
20    int a,b;
21    cout<<"Enter the values of a & b:";
22
23    cin>>a;
24    cout<<"Value of a & b before calling swap function:";
25    cout<<a<<\n";
26    cout<<b<<\n";
27    swap(a,b);
28    cout<<"Value of a & b after calling swap function:";
29    cout<<a<<\n";
30    cout<<b<<\n";
31
32    return 0;
33}
```

## Practical 8

### Task 7 V2

#### Source Code:

```
#include
<iostream>

using namespace std;

void swap(int &a,int &b)
{
    int t;
    t=a;
    a=b;
    b=t;
}

int main()
{
    int a,b;
    cout<<"Enter the values of a & b\n";
    cin>>a;
    cin>>b;
    cout<<"Value of a & b before calling swap function\n";
    cout<<a<<'\n';
    cout<<b<<'\n';
    swap(a,b);
    cout<<"Value of a & b after calling swap function\n";
    cout<<a<<'\n';
    cout<<b<<'\n';
    return 0;
}
```

## Output

The screenshot shows a terminal window with the following session:

```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ g++ t7_2.cpp
$ ./a.out
Enter the values of a & b
10
20
Value of a & b before calling swap function
10
20
int main()
Value of a & b after calling swap function
20
10
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$
```

The terminal window has a dark background and light-colored text. It shows the command-line interface where the user runs a C++ compiler (g++) on a file named t7\_2.cpp, then executes the resulting binary (./a.out). The program prompts for two integer inputs, a and b. It then prints their initial values before calling a swap function. After the swap, it prints the values again, showing that they have been exchanged.

## Practical 8

### Task 7 V2

#### Source Code:

```
#include
<iostream>

using namespace std;

void swap(int *a,int *b)
{
    int t;
    t=*a;
    *a=*b;
    *b=t;
}

int main()
{
    int a,b;
    cout<<"Enter the values of a & b\n";
    cin>>a;
    cin>>b;
    cout<<"Value of a & b before calling swap function\n";
    cout<<a<<'\n';
    cout<<b<<'\n';
    swap(&a,&b);
    cout<<"Value of a & b after calling swap function\n";
    cout<<a<<'\n';
    cout<<b<<'\n';
    return 0;
}
```

## Output

```

(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ g++ t7_3.cpp
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ ./a.out
Enter the values of a & b
30    t=*a;
50    *a=*b;
Value of a & b before calling swap function
30
50 int main()
Value of a & b after calling swap function
50    cout<<"Enter the values of a & b:";
30    cin>>a;
18    cin>>b;
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 8 c++]
$ 0    cout<<a<<'\n';
21    cout<<b<<'\n';
22    swap(&a,&b);
23    cout<<"Value of a & b after calling swap Function:";
24    cout<<a<<'\n';
25    cout<<b<<'\n';
26    return 0;
27 }

```

## Practical 9

### Task 1 V1

#### Source Code:

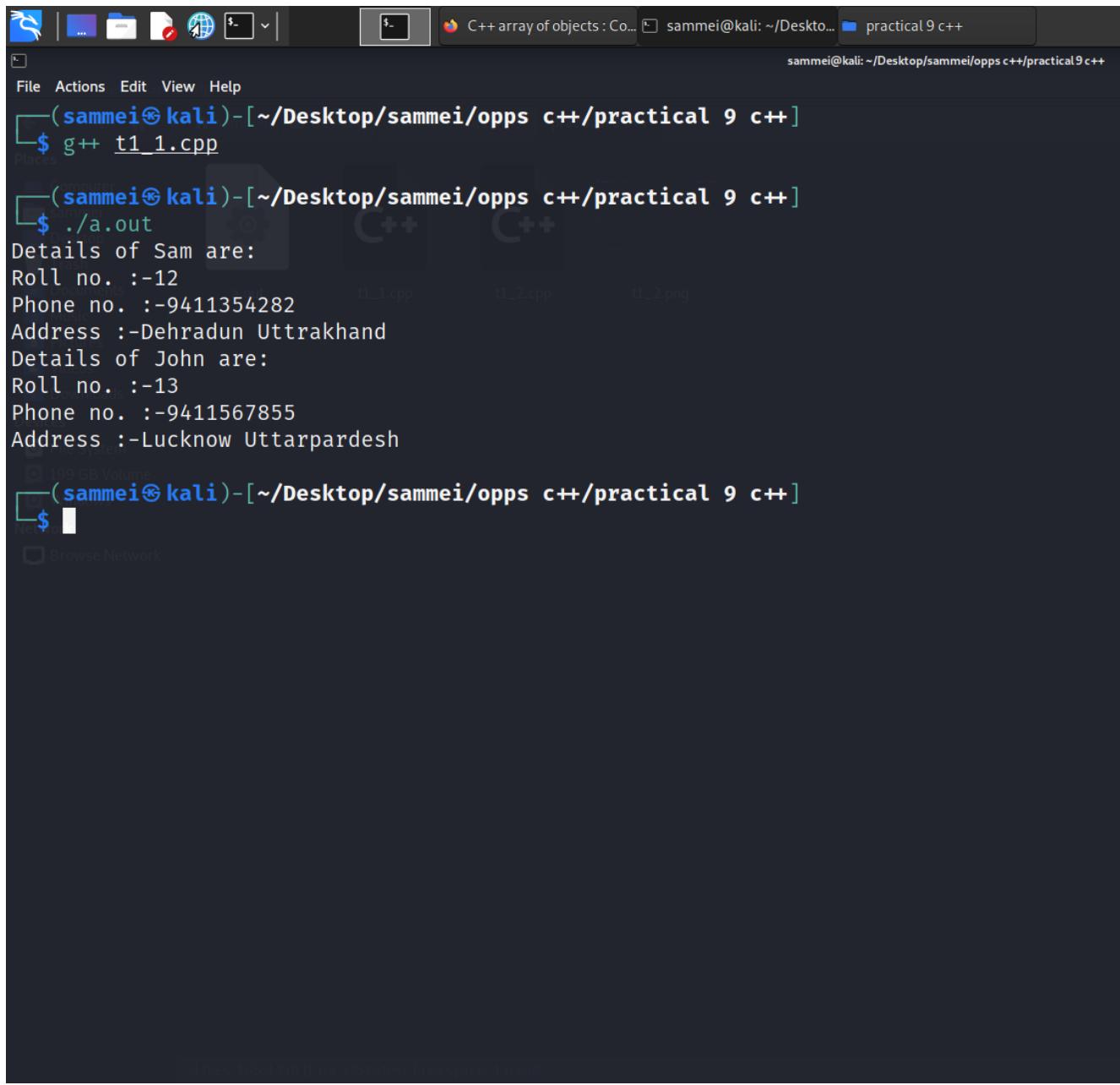
```
#include
<iostream>
#include <string>

using namespace std;

class Student
{
public:
    int rno;
    long int phn;
    string adrs;
    string name;
};

int main()
{
    Student obj1;
    Student obj2;
    obj1.rno=12;
    obj1.phn=9411354282;
    obj1.adrs="Dehradun Uttrakhand";
    obj1.name="Sam";
    obj2.rno=13;
    obj2.phn=9411567855;
    obj2.adrs="Lucknow Uttar Pradesh";
    obj2.name="John";
    cout<<"Details of "<<obj1.name<<" are:\n";
    cout<<"Roll no. :-"<<obj1.rno<<"\n";
    cout<<"Phone no. :-"<<obj1.phn<<"\n";
    cout<<"Address :-"<<obj1.adrs<<"\n";
    cout<<"Details of "<<obj2.name<<" are:\n";
    cout<<"Roll no. :-"<<obj2.rno<<"\n";
    cout<<"Phone no. :-"<<obj2.phn<<"\n";
    cout<<"Address :-"<<obj2.adrs<<"\n";
    return 0;
}
```

## Output



The screenshot shows a terminal window on a Kali Linux desktop environment. The terminal title is "C++ array of objects : Co..." and the command line shows the user's path and current directory: "sammei@kali: ~/Desktop/practical 9 c++". The user has run the command "g++ t1\_1.cpp" to compile the file "t1\_1.cpp". The output of the program is displayed, showing details for two objects: Sam and John. Sam's details are: Roll no. :-12, Phone no. :-9411354282, Address :-Dehradun Uttrakhand. John's details are: Roll no. :-13, Phone no. :-9411567855, Address :-Lucknow Uttarpardesh. The terminal window also shows icons for file operations like Cut, Copy, Paste, and Undo/Redo, and a "Places" menu.

```
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 9 c++]
$ g++ t1_1.cpp
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 9 c++]
$ ./a.out
Details of Sam are:
Roll no. :-12
Phone no. :-9411354282
Address :-Dehradun Uttrakhand
Details of John are:
Roll no. :-13
Phone no. :-9411567855
Address :-Lucknow Uttarpardesh
$
```

## Practical 9

### Task 1 V2

#### Source Code:

```
#include
<iostream>
#include <string>

using namespace std;

class student
{
public:
    string name;
    int age;
    int year;
    char sec;
    int marks;
};

int main()
{
    student s[4];
    int i,sum=0;
    for(i=0;i<4;i++)
    {
        cout<<"Enter details of student "<<i+1<<"\n";
        cout<<"Enter name\n";
        cin>>s[i].name;
        cout<<"Enter age\n";
        cin>>s[i].age;
        cout<<"Enter year\n";
        cin>>s[i].year;
        cout<<"Enter section\n";
        cin>>s[i].sec;
        cout<<"Enter marks\n";
        cin>>s[i].marks;
        sum=sum+s[i].marks;
    }
    cout<<"Total marks of students in college = "<<sum<<"\n";
    return 0;
}
```

## Output

```

(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ ./a.out
Enter details of student 1
Enter name
Vaibhav
Enter age
20
Enter year
Enter section
A
Enter marks
93
Enter details of student 2
Enter name
Rama
Enter age
21
Enter year
Enter marks
24
Enter section
E
Enter marks
88
Enter details of student 3
Enter name
Mayank
Enter age
19
for(i=0;i<4;i++)
Enter year
2
Enter section
cout<<"Enter details of student "<<i+1<<"\n";
M
Enter marks
88
cout<<"Enter age\n";
Enter details of student 4
Enter name
Abhishek
Enter age
20
cout<<"Enter year\n";
Enter year
2
Enter section
cout<<"Enter section\n";
K
Enter marks
85
Total marks of students in college = 354
36 cout<<"Total marks of students in college = "<<sum<<"\n";
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ 

```

## Practical 9

### Task 2

#### Source Code:

```

#include
<iostream>

using namespace std;

class Area
{
public:
    int length;
    int breadth;
    Area( int l, int b )
    {
        length = l;
        breadth = b;
    }
    Area( int l )
    {
        length = l;
    }
    int printAreaR()
    {
        return length * breadth;
    }
    int printAreaS()
    {
        return length * length;
    }
};

int main()
{
    Area rt1( 7, 4 );
    Area sq2(25);
    cout << "Area of rectangle " << rt1.printAreaR() << endl;
    cout << "Area of square " << sq2.printAreaS() << endl;
    return 0;
}

```

## Output

The screenshot shows a terminal window on a Kali Linux desktop environment. The terminal output is as follows:

```
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 9 c++]
$ g++ t2.cpp
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 9 c++]
$ ./a.out
Area of rectangle 28
Area of square 625
(sammei㉿kali)-[~/Desktop/sammei/opp... practical 9 c++]
```

The terminal is located in a window titled "sammei@kali: ~/Desktop/sammei/opp... practical 9 c++". The desktop background features a C++ logo. The file "t2.cpp" was compiled into "a.out", which was then run to output the areas of a rectangle (28) and a square (625).

## Practical 9

### Task 3

#### Source Code:

```

#include
<iostream>

using namespace std;

class item
{
    static int count;
    int number;
public:
    void getdata(int a)
    {
        number=a;
        count++;
    }

    void getcount(void)
    {
        cout<<"Count :"<<count<<"\n";
    }
};

int item::count;

int main()
{
    item a,b,c;
    cout<<'\n'<<"Before reading data"<<'\n';
    a.getcount();
    b.getcount();
    c.getcount();

    cout<<'\n'<<"After while data"<<'\n';
    a.getdata(123);
    a.getcount();
    b.getdata(456);
    b.getcount();
    c.getdata(789);
    c.getcount();
}

```

```

cout<<'\n'<<"After reading data"<<'\n';

a.getcount();
b.getcount();
c.getcount();
return 0;
}

```

## Output

```

(sammei㉿kali)-[~/Desktop/sammei/opp$ g++ t3.cpp
(sammei㉿kali)-[~/Desktop/sammei/opp$ ./a.out
Before reading data
Count :0
Count :0
Count :0
After while data
Count :1
Count :2
Count :3

After reading data
Count :3
Count :3
Count :3
main()
Count :3
em a,b,c;
cout<<'\n'<<"Before reading data"<<'\n';
(sammei㉿kali)-[~/Desktop/sammei/opp$ b.getcount();
c.getcount();
31
32 cout<<'\n'<<"After while data"<<'\n';
33 a.getdata(10);
34 a.getcount();
35 b.getdata(10);
36 b.getcount();
37 c.getdata(10);
38 c.getcount();
39
40 cout<<'\n'<<"After reading data"<<'\n';
41
42 a.getcount();
43 b.getcount();
44 c.getcount();

```

## Practical 9

### Task 4

#### Source Code:

```

#include
<iostream>
#include <string>

using namespace std;

class student
{
public:
    string name;
    int age;
    int marks;
    friend int add(student s1,student s2,student s3);
};

int add(student s1,student s2,student s3)
{
    int sum=0;
    sum=sum+s1.marks+s2.marks+s3.marks;
    cout<<"Total marks of students in college = "<<sum<<"\n";
    return 0;
}

int main()
{
    student s1,s2,s3;
    s1.name="Sammei";
    s1.age=20;
    s1.marks=93;
    s2.name="Rama";
    s2.age=20;
    s2.marks=88;
    s3.name="Masky";
    s3.age=20;
    s3.marks=85;
    int i,sum=0;
    sum=add(s1,s2,s3);
    return 0;
}

```

## Output

```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ g++ t4.cpp
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ ./a.out
Total marks of students in college = 266
```

```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
```

```
string name;
int age;
int marks;
void add(int add(student s1,student s2,student s3));
int add(student s1,student s2,student s3)
{
    int sum=0;
    sum=sum+s1.marks+s2.marks+s3.marks;
    cout<<"Total marks of students in college = "<<sum<<endl;
}
int main()
{
    student s1,s2,s3;
    s1.name="Sammei";
    s1.age=20;
    s1.marks=33;
    s2.name="Raine";
    s2.age=20;
    s2.marks=33;
    s3.name="Masky";
    s3.age=20;
    s3.marks=33;
    int i,sum=0;
    sum=add(s1,s2,s3);
    cout<<endl;
}
```

## Practical 9

### Task 5

#### Source Code:

```
#include
<iostream>
#include <string>

using namespace std;

class College
{
public:
    string name;
    string address;
    long int phn;
};

typedef struct student
{
    string name;
    int age;
    long int phn;
}student;

int main()
{
    College obj;
    obj.name="Graphic Era Hill University";
    obj.address="Dehradun Uttrakhand";
    obj.phn=9445245637;

    student s1;
    s1.name="Vaibhav Kumar";
    s1.age=20;
    s1.phn=9411354282;

    cout<<"\nCollege Details :\n";
    cout<<obj.name<<'\n';
    cout<<obj.address<<'\n';
    cout<<obj.phn<<'\n';

    cout<<"\nStudent Details :\n";
}
```

```

cout<<s1.name<<'\n';
cout<<s1.age<<'\n';
cout<<s1.phn<<'\n';
return 0;
}

```

## Output

```

File Actions Edit View Help
└──(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ g++ t5.cpp
└──(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ ./a.out
College Details :
Graphic Era Hill University
Dehradun Uttrakhand
9445245637

Student Details :
Vaibhav Kumar
20
9411354282
└──(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 9 c++]
$ █
27
28     student s1;
29     s1.name="Vaibhav Kumar";
30     s1.age=20;
31     s1.phn=9411354282;
32
33     cout<<"College Details : ";
34     cout<<obj.name<<'\n';
35     cout<<obj.address<<'\n';
36     cout<<obj.phn<<'\n';
37
38     cout<<"Student Details : ";
39     cout<<s1.name<<'\n';
40     cout<<s1.age<<'\n';
41     cout<<s1.phn<<'\n';
42
43 }

```

## Practical 9

### Task 6

#### Source Code:

```
#include
<iostream>
#include <iomanip>

using namespace std;

int main ()
{
    cout<<"Vaibhav Kumar Kapriyal"=>endl;

    cout<<setw(15)<<200111163<<endl;

    cout<<setfill('*')<<setw(15)<<200111163<<endl;
    return 0;
}
```

#### Output

```
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 9 c++]
$ g++ t6.cpp
(sammei㉿kali)-[~/Desktop/sammei/opps c++/practical 9 c++]
$ ./a.out
Vaibhav Kumar Kapriyal
*****200111163
```

## Practical 10

### Task 1

#### Source Code:

```
#include
<iostream>
#include <string>

using namespace std;

class Directory
{
public:
    string name;
    string address;
    long int telephn;
    long int mobilephn;
    string head;
};

int main()
{
    cout<<"\nEnter the objects to created: \n";
    int n,i,sum=0;
    cin>>n;
    Directory d[n];
    for(i=0;i<n;i++)
    {
        cout<<"\nEnter details of "<<i+1<<" person\n";
        cout<<"Enter name :\n";
        cin>>d[i].name;
        cout<<"Enter address :\n";
        cin>>d[i].address;
        cout<<"Enter tele-phone no. :\n";
        cin>>d[i].telephn;
        cout<<"Enter mobile no. :\n";
        cin>>d[i].mobilephn;
        cout<<"Enter name of the Head of the Family :\n";
        cin>>d[i].head;
    }
    for(i=0;i<n;i++)
    {
```

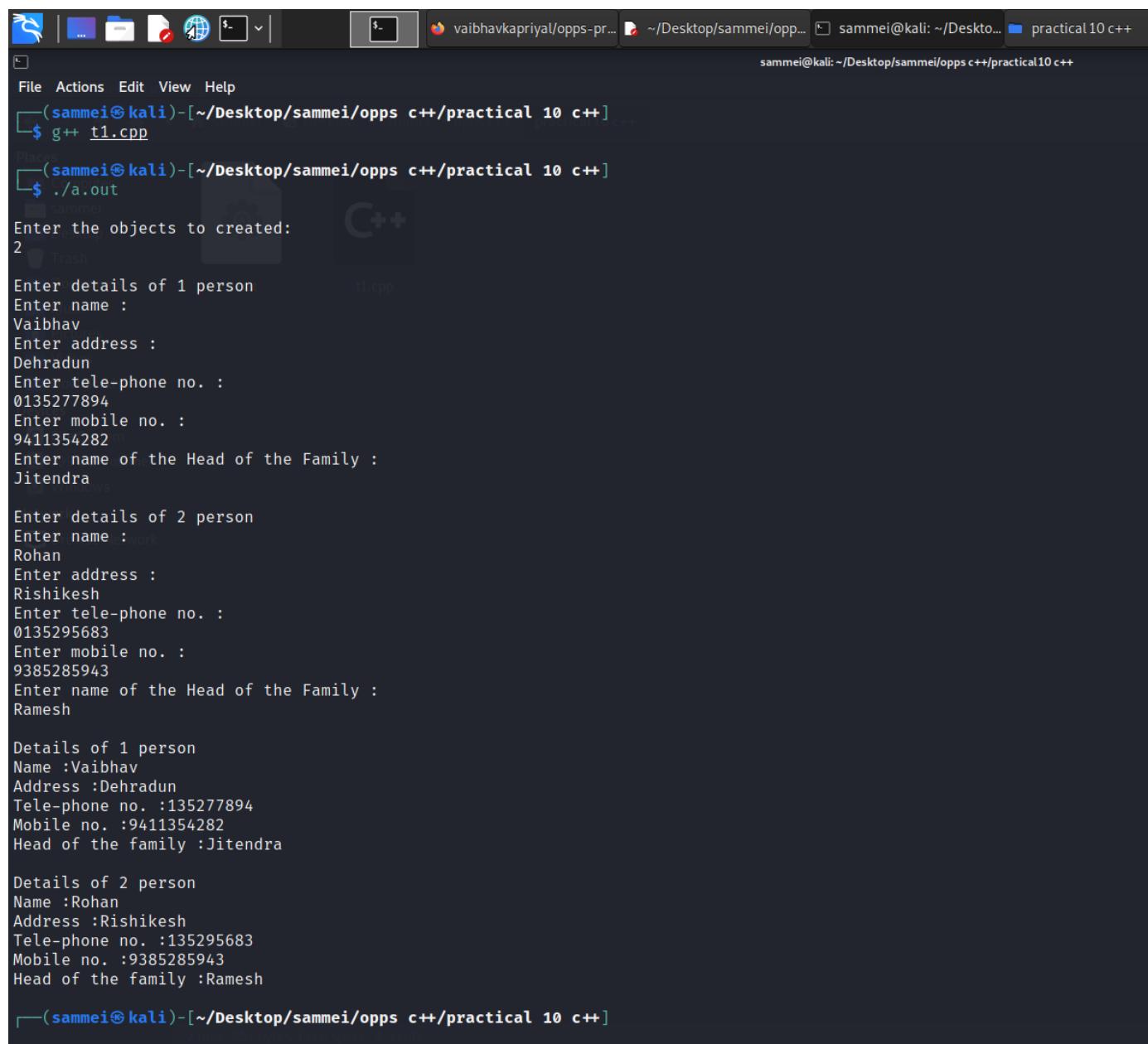
```

        cout<<"\nDetails of "<<i+1<<" person\n";
        cout<<"Name :"<<d[i].name<<'\n';
        cout<<"Address :"<<d[i].address<<'\n';
        cout<<"Tele-phone no. :"<<d[i].telephn<<'\n';
        cout<<"Mobile no. :"<<d[i].mobilephn<<'\n';
        cout<<"Head of the family :"<<d[i].head<<'\n';
    }
}

return 0;
}

```

## Output



```

File Actions Edit View Help
(vaibhavk@kali)-[~/Desktop/sammei/opp...]
$ g++ t1.cpp
(vaibhavk@kali)-[~/Desktop/sammei/opp...]
$ ./a.out
Enter the objects to created:
2
Enter details of 1 person
Enter name :
Vaibhav
Enter address :
Dehradun
Enter tele-phone no. :
0135277894
Enter mobile no. :
9411354282
Enter name of the Head of the Family :
Jitendra

Enter details of 2 person
Enter name :
Rohan
Enter address :
Rishikesh
Enter tele-phone no. :
0135295683
Enter mobile no. :
9385285943
Enter name of the Head of the Family :
Ramesh

Details of 1 person
Name :Vaibhav
Address :Dehradun
Tele-phone no. :135277894
Mobile no. :9411354282
Head of the family :Jitendra

Details of 2 person
Name :Rohan
Address :Rishikesh
Tele-phone no. :135295683
Mobile no. :9385285943
Head of the family :Ramesh

(vaibhavk@kali)-[~/Desktop/sammei/opp...

```

## Practical 10

### Task 2

#### Source Code:

```
#include
<iostream>
#include <string>

using namespace std;

class Student
{
public:
    int rno;
    long int phn;
    string adrs;
    string name;
    void display()
    {
        cout<<"Details of "<<name<<" are:\n";
        cout<<"Roll no. :-"<<rno<<"\n";
        cout<<"Phone no. :-"<<phn<<"\n";
        cout<<"Address :-"<<adrs<<"\n";
    }
};

int main()
{
    Student *s=new Student;
    s->rno=12;
    s->phn=9411354282;
    s->adrs="Dehradun Uttrakhand";
    s->name="Sam";
    s->display();
    return 0;
}
```

## Output

The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a toolbar with icons for file operations like copy, paste, and save. The title bar displays the path: 'opp-practicals/practica...' and the command: 'sammei@kali: ~/Desktop/sammei/opp... practical10 c++'. Below the title bar, a menu bar includes 'File', 'Actions', 'Edit', 'View', and 'Help'. The main area of the terminal shows the following session:

```
(sammei㉿kali)-[~/Desktop/sammei/opp-practicals/practical 10 c++]
$ g++ t2.cpp

(sammei㉿kali)-[~/Desktop/sammei/opp-practicals/practical 10 c++]
$ ./a.out
Details of Sam are:
Roll no. :-12
Phone no. :-9411354282
Address :-Dehradun Uttrakhand

(sammei㉿kali)-[~/Desktop/sammei/opp-practicals/practical 10 c++]
$
```

On the left side of the terminal window, there's a sidebar with sections for 'System' (showing '199 GB Volume'), 'Network' (with 'Browse Network' option), and other system-related links.

## Practical 10

### Task 3

#### Source Code:

```
#include
<iostream>

using namespace std;

class Abc
{
public:
    int a;
    int b;
    Abc(int a,int b)
    {
        this->a=a;
        this->b=b;
    }
    void compute()
    {
        float r;
        r=a%b;
        cout<<"Remainder of "<<a<<' '<<b<<" = "<<r<<'\n';
    }
};

int main()
{
    int a,b;
    cout<<"Enter any two numbers :\n";
    cin>>a;
    cin>>b;
    Abc obj(a,b);
    obj.compute();
    return 0;
}
```

## Output

```
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 10 c++]
$ g++ t3.cpp
$ ./a.out
Enter any two numbers :
15
7
Remainder of 15 7 = 1
(sammei㉿kali)-[~/Desktop/sammei/oppss c++/practical 10 c++]
$ void compute()
{
    float r;
    r=a%b;
    cout<<"Remainder of "<<a<<" "<<b<<" = "<<r<<\n";
}
int main()
{
    int a,b;
    cout<<"Enter any two numbers :\n";
    cin>>a;
    cin>>b;
    Abc obj(a,b);
    obj.compute();
    return 0;
}
```

## Practical 10

### Task 4 V1

#### Source Code:

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

class Complex {
public:
    int a;

    void input() {
        cout << "Enter a number:\n ";
        cin >> a;
    }

    friend Complex operator < (const Complex& obj);

    void output() {
        cout<<"Smaller number is "<<a<<"\n";
    }
};

Complex operator < (Complex& obj1,Complex& obj2) {
    if(obj1.a<obj2.a)
        return (obj1.a);
    else
        return (obj2.a);
}

int main() {
    Complex complex1, complex2, result;

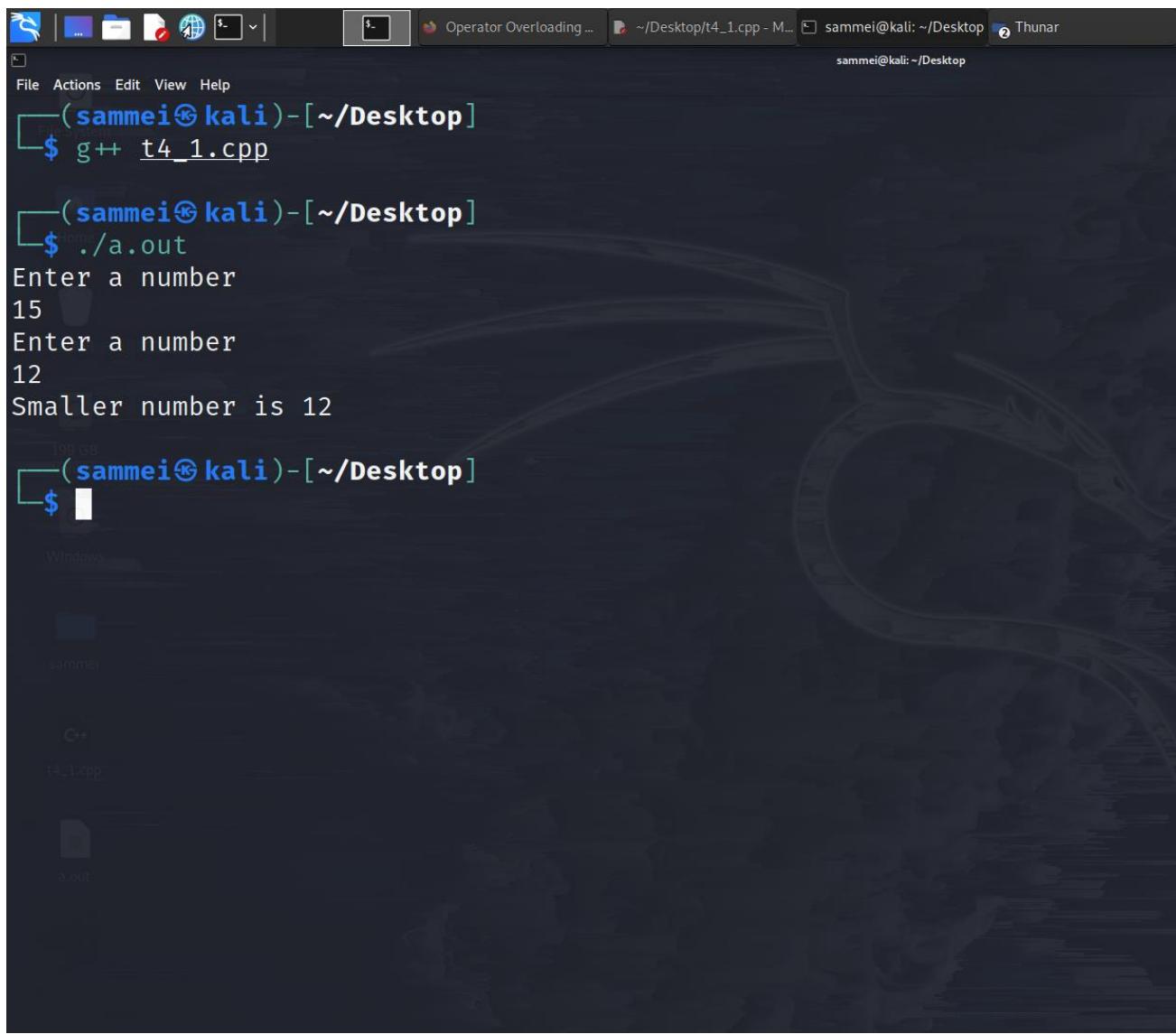
    complex1.input();

    complex2.input();

    result = complex1 < complex2;
    result.output();
```

```
    return 0;  
}
```

## Output



```
(sammei㉿kali)-[~/Desktop]$ g++ t4_1.cpp  
(sammei㉿kali)-[~/Desktop]$ ./a.out  
Enter a number  
15  
Enter a number  
12  
Smaller number is 12  
(sammei㉿kali)-[~/Desktop]$
```

## Practical 10

### Task 4 V2

#### Source Code:

```
#include
<iostream>

using namespace std;

class Complex {
private:
    int real;
    int imag;

public:
    Complex() : real(0), imag(0) {}

    void input() {
        cout << "Enter real and imaginary parts respectively: ";
        cin >> real;
        cin >> imag;
    }

    Complex operator + (const Complex& obj) {
        Complex temp;
        temp.real = real + obj.real;
        temp.imag = imag + obj.imag;
        return temp;
    }

    void output() {
        if (imag < 0)
            cout << "Output Complex number: " << real << imag << "i";
        else
            cout << "Output Complex number: " << real << "+" << imag <<
        "i";
    }
};

int main() {
    Complex complex1, complex2, result;
```

```

        cout << "Enter first complex number:\n";
        complex1.input();

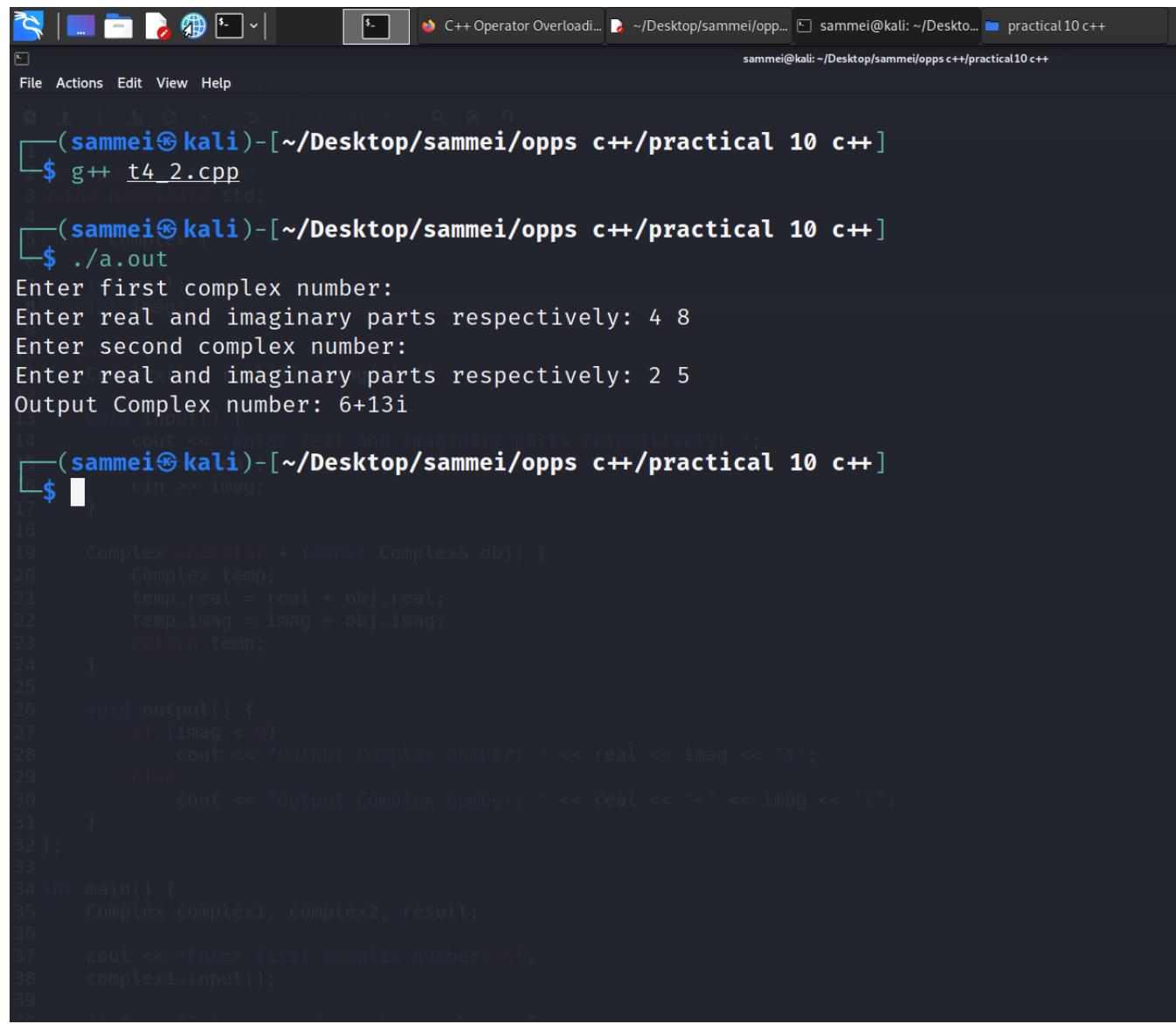
        cout << "Enter second complex number:\n";
        complex2.input();

        result = complex1 + complex2;
        result.output();

        return 0;
    }
}

```

## Output



```

File Actions Edit View Help
File Actions Edit View Help
1 (sammei㉿kali)-[~/Desktop/sammei/opp... c++/practical 10 c++]
2 $ g++ t4_2.cpp
3 #include <iostream>
4 #include <complex>
5 using namespace std;
6
7 (sammei㉿kali)-[~/Desktop/sammei/opp... c++/practical 10 c++]
8 $ ./a.out
9 Enter first complex number:
10 Enter real and imaginary parts respectively: 4 8
11 Enter second complex number:
12 Enter real and imaginary parts respectively: 2 5
13 Output Complex number: 6+13i
14
15 void Input() {
16     cout << "Enter real and imaginary parts respectively: ";
17     cin >> real >> imag;
18 }
19
20 Complex operator + (const Complex& obj) {
21     Complex temp;
22     temp.real = real + obj.real;
23     temp.imag = imag + obj.imag;
24     return temp;
25 }
26
27 void output() {
28     if (imag < 0)
29         cout << "Output Complex number: " << real << imag << "i";
30     else
31         cout << "Output Complex number: " << real << "+" << imag << "i";
32 }
33
34 int main() {
35     Complex complex1, complex2, result;
36
37     cout << "Enter first complex number: ";
38     complex1.input();
39
40     cout << "Enter second complex number: ";
41     complex2.input();
42
43     result = complex1 + complex2;
44
45     result.output();
46 }

```