INDEX

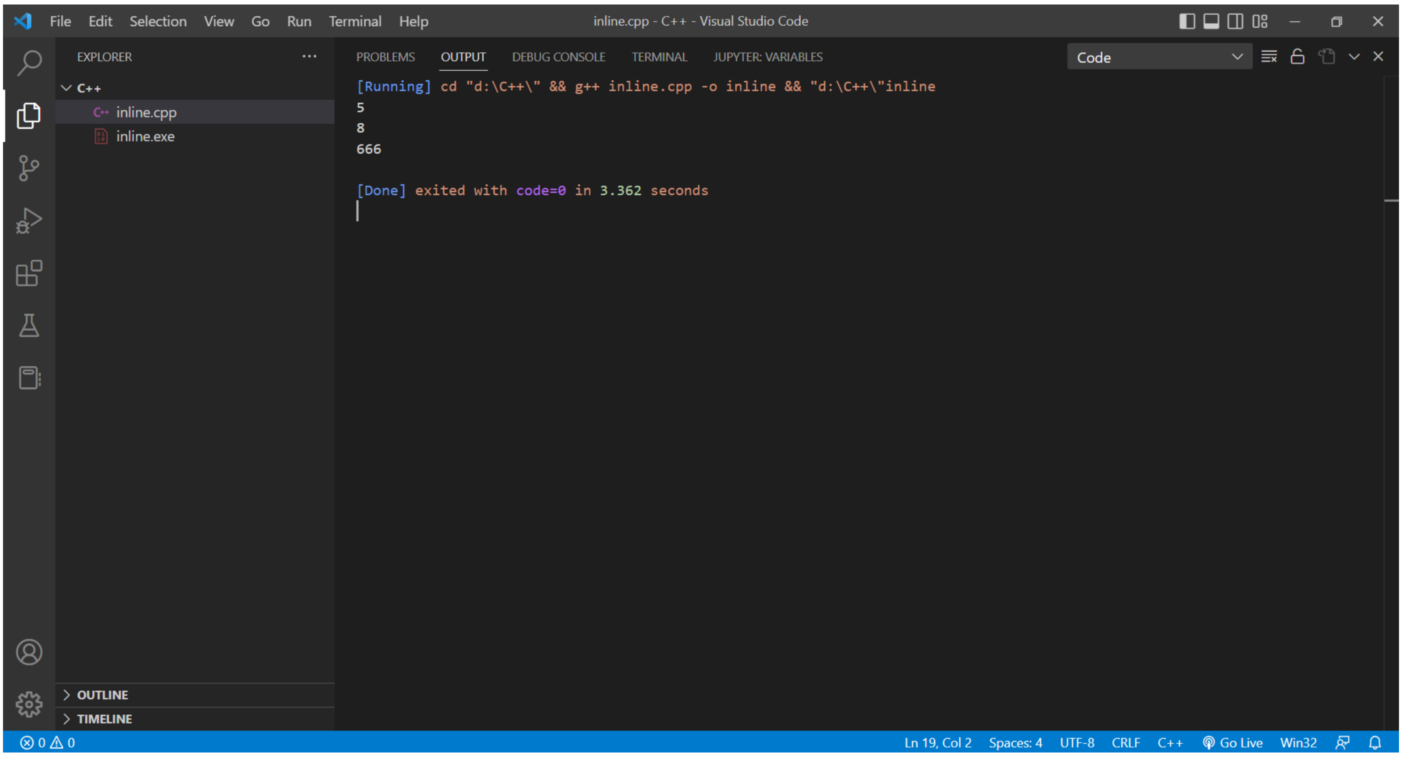
PROGRAMS

1. WAP to implement ‘Inline function’.

CODE: -

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

inline void displayNum(int num) {
    cout << num << endl;
}

int main() {
    // first function call
    displayNum(5);

    // second function call
    displayNum(8);

    // third function call
    displayNum(666);

    return 0;
}
```

OUTPUT: -



```
[Running] cd "d:\C++\" && g++ inline.cpp -o inline && "d:\C++\"inline
5
8
666

[Done] exited with code=0 in 3.362 seconds
```

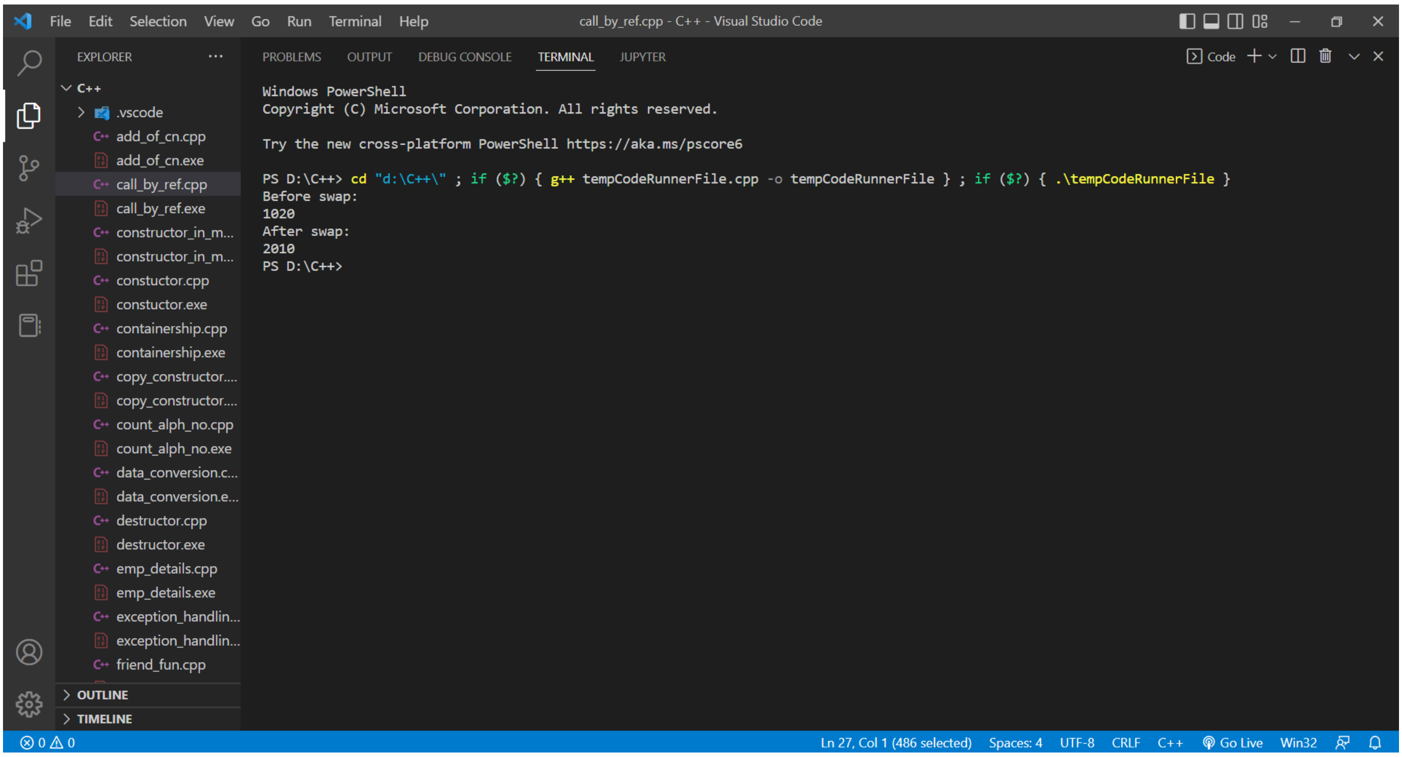
2. WAP to implement call by reference and return by reference using class. [Hint. Assume necessary functions].

CODE: -

i.

```
#include <iostream>
using namespace std;
class A
{

    public:
    void swapNums(int &x, int &y)
    {
      int z = x;
      x = y;
      y = z;
    }

};
int main()
{
     int firstNum = 10;
    int secondNum = 20;
  A a1;
        cout << "Before swap: " << "\n";
        cout << firstNum << secondNum << "\n";
        a1.swapNums(firstNum, secondNum);
        cout << "After swap: " << "\n";
        cout << firstNum << secondNum << "\n";
    return 0;
}
```

OUTPUT: -

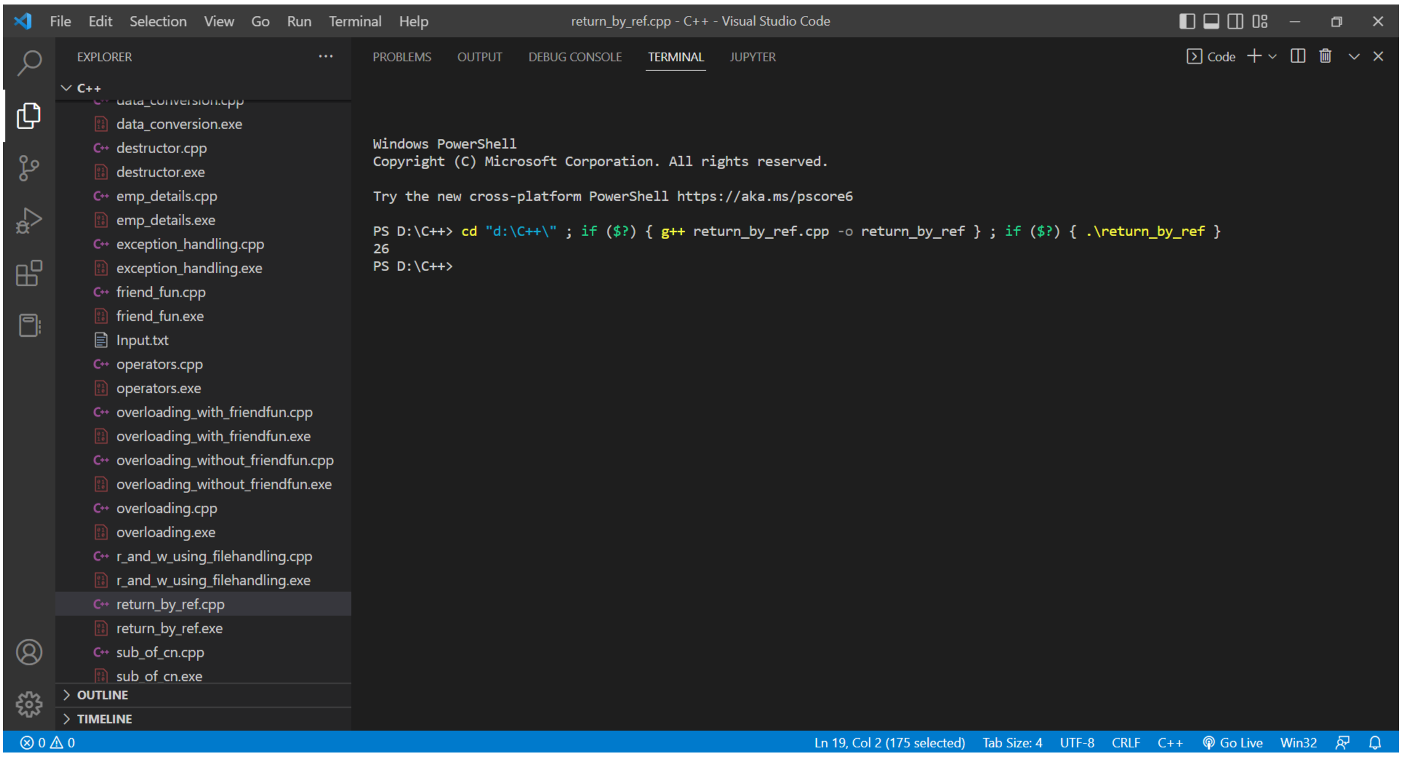


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Before swap:
1020
After swap:
2010
PS D:\C++>
```

ii.

```
// C++ program to illustrate return by reference
#include <iostream>
using namespace std;
int a;
class A
{
    public:
    int& num()
    {
        return a;
    }
};
int main()
{
    A a1;
    a1.num()=26;
    cout<<a;

    return 0;
}
```

OUTPUT: -



File Edit Selection View Go Run Terminal Help
return_by_ref.cpp - C++ - Visual Studio Code
EXPLORER
C++
data_conversion.cpp
data_conversion.exe
destructor.cpp
destructor.exe
emp_details.cpp
emp_details.exe
exception_handling.cpp
exception_handling.exe
friend_fun.cpp
friend_fun.exe
Input.txt
operators.cpp
operators.exe
overloading_with_friendfun.cpp
overloading_with_friendfun.exe
overloading_without_friendfun.cpp
overloading_without_friendfun.exe
overloading.cpp
overloading.exe
r_and_w_using_filehandling.cpp
r_and_w_using_filehandling.exe
return_by_ref.cpp
return_by_ref.exe
sub_of_cn.cpp
sub_of_cn.exe
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
Code
⊗ 0 ⚠ 0
Ln 19, Col 2 (175 selected) Tab Size: 4 UTF-8 CRLF C++ Go Live Win32

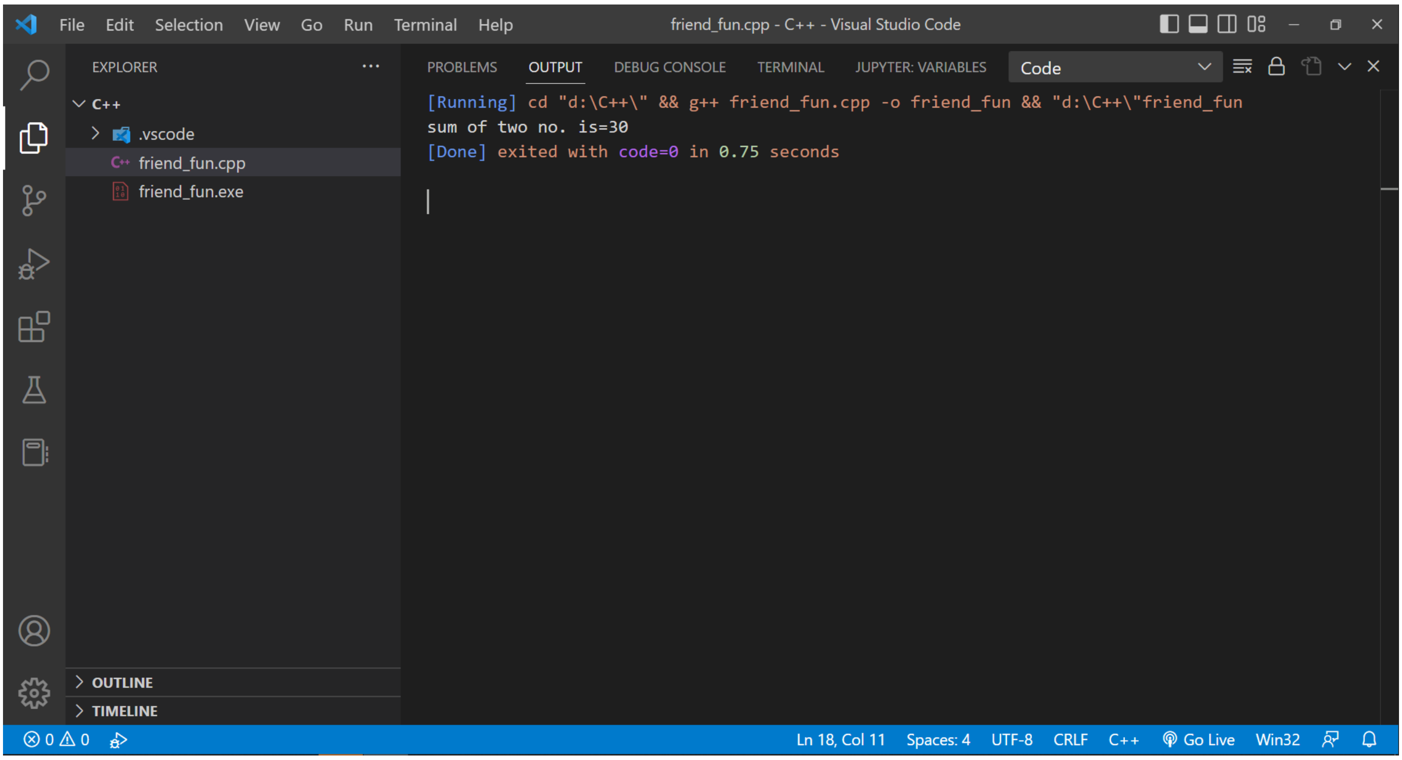
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ return_by_ref.cpp -o return_by_ref } ; if ($?) { .\return_by_ref }
26
PS D:\C++>
```

3. WAP to implement friend function by taking some real-life example.

CODE: -

```
#include <iostream>
using namespace std;
class B;
class A
{
public:
    int x;
    friend void sum(A, B);
};
class B
{
public:
    int y;
    friend void sum(A, B);
};
void sum(A a1, B b1)
{
    int c;
    c = a1.x + b1.y;
    cout << "sum of two no. is=" << c;
}
int main()
{
    A a1;
    B b1;
    a1.x = 10;
    b1.y = 20;
    sum(a1, b1);
    return 0;
}
```

OUTPUT: -



File Edit Selection View Go Run Terminal Help
friend_fun.cpp - C++ - Visual Studio Code
EXPLORER
C++
.vscode
friend_fun.cpp
friend_fun.exe
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER: VARIABLES
Code
Ln 18, Col 11 Spaces: 4 UTF-8 CRLF C++ Go Live Win32

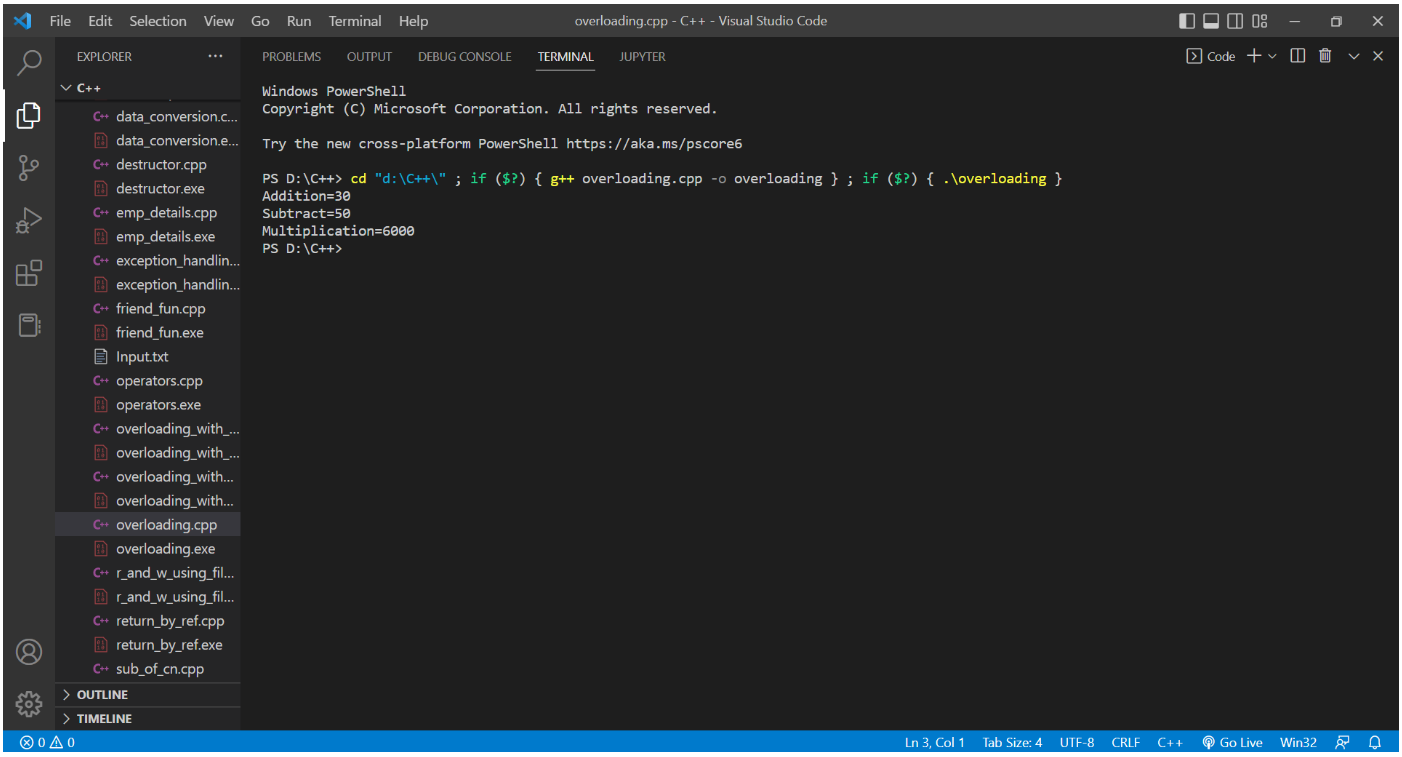
```
[Running] cd "d:\C++\" && g++ friend_fun.cpp -o friend_fun && "d:\C++\"friend_fun
sum of two no. is=30
[Done] exited with code=0 in 0.75 seconds
```

4. WAP to implement ‘Function Overloading’.

<u>CODE: -</u>

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

class A{
    int a=10;
    int b=20;
    public:
    void fun(){
        int sum=a+b;
        cout<<"Addition="<<sum<<endl;
    }
    void fun(int x,int y){
        int sub=x-y;
        cout<<"Subtract="<<sub<<endl;
    }
    void fun(int i,int j, int k){
        int mul=i*j*k;
        cout<<"Multiplication="<<mul<<endl;
    }
};
int main(){
    A a1;
    a1.fun();
    a1.fun(100,50);
    a1.fun(10,20,30);
    return 0;
}
```

OUTPUT: -



```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ overloading.cpp -o overloading } ; if ($?) { .\overloading }
Addition=30
Subtract=50
Multiplication=6000
PS D:\C++>
```

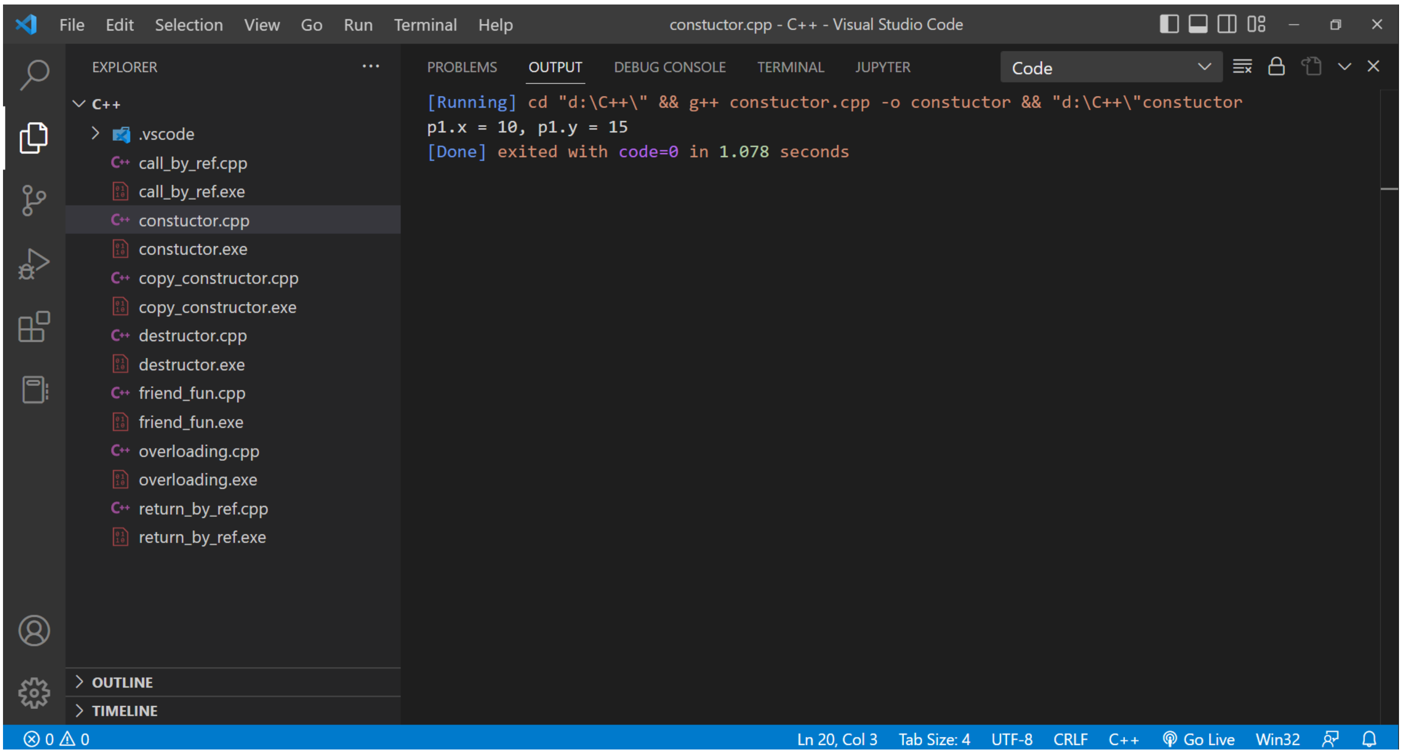
5. WAP to implement Parameterized Constructor, Copy Constructor and Destructor.

CODE: -

i.

```
// CPP program to illustrate
// parameterized constructors
#include <iostream>
using namespace std;

class Point {
private:
    int x, y;

public:
    // Parameterized Constructor
    Point(int x1, int y1)
    {
        x = x1;
        y = y1;
    }

    int getX() { return x; }
    int getY() { return y; }
};

int main()
{
    // Constructor called
    Point p1(10, 15);

    // Access values assigned by constructor
    cout << "p1.x = " << p1.getX()
        << ", p1.y = " << p1.getY();

    return 0;
}
```

OUTPUT: -



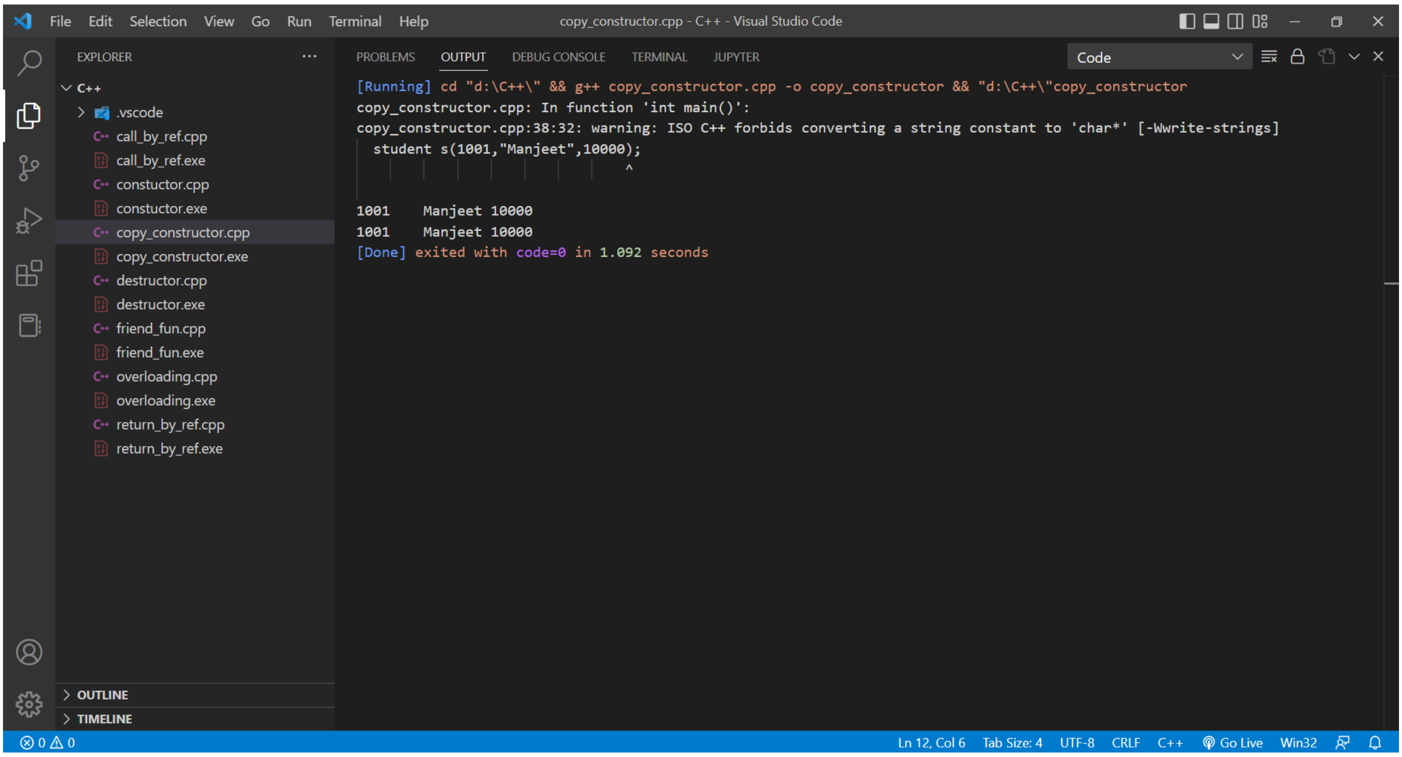
```
[Running] cd "d:\C++\" && g++ constuctor.cpp -o constuctor && "d:\C++\"constuctor
p1.x = 10, p1.y = 15
[Done] exited with code=0 in 1.078 seconds
```

ii.

CODE: -

```
#include<iostream>
#include<string.h>
using namespace std;
class student
{
   int rno;
   char name[50];
   double fee;
   public:
   student(int,char[],double);
   student(student &t)  //copy constructor
   {
      rno=t.rno;
      strcpy(name,t.name);
      fee=t.fee;
   }
   void display();

};



   student::student(int no,char n[],double f)
   {
      rno=no;
      strcpy(name,n);
      fee=f;
   }

void student::display()
   {
      cout<<endl<<rno<<"\t"<<name<<"\t"<<fee;
   }

int main()
{
   student s(1001,"Manjeet",10000);
   s.display();

   student manjeet(s); //copy constructor called
   manjeet.display();

   return 0;
}
```

OUTPUT: -



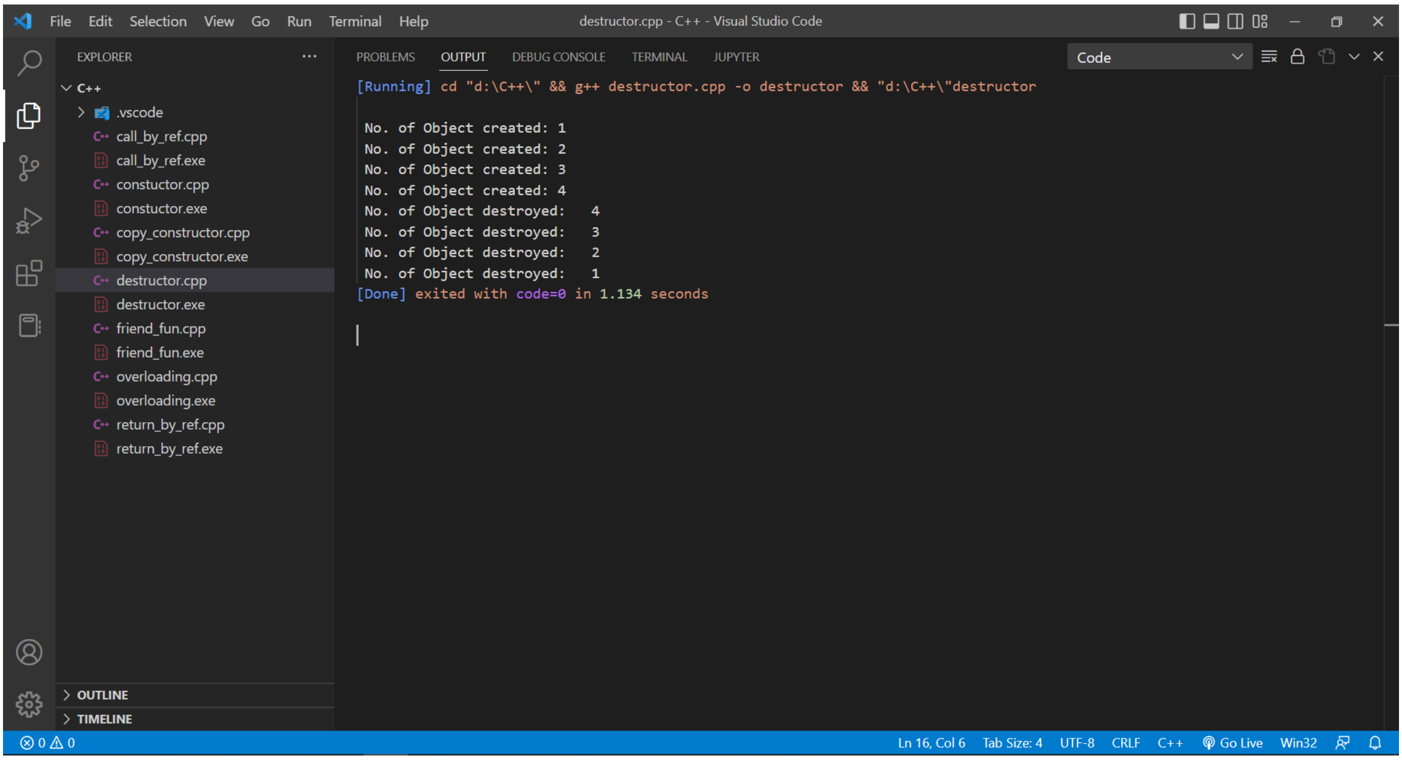
```
[Running] cd "d:\C++\" && g++ copy_constructor.cpp -o copy_constructor && "d:\C++\"copy_constructor
copy_constructor.cpp: In function 'int main()':
copy_constructor.cpp:38:32: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
  student s(1001,"Manjeet",10000);
                                ^

1001    Manjeet 10000
1001    Manjeet 10000
[Done] exited with code=0 in 1.092 seconds
```

iii.

CODE: -

```
#include <iostream>
using namespace std;
int count = 0;
class Test {
public:
   Test()
   {
      count++;
      cout << "\n No. of Object created:\t" << count;
   }

   ~Test()
   {
      cout << "\n No. of Object destroyed:\t" << count;
      --count;
   }
};

main()
{
   Test t, t1, t2, t3;
   return 0;
}
```

OUTPUT: -



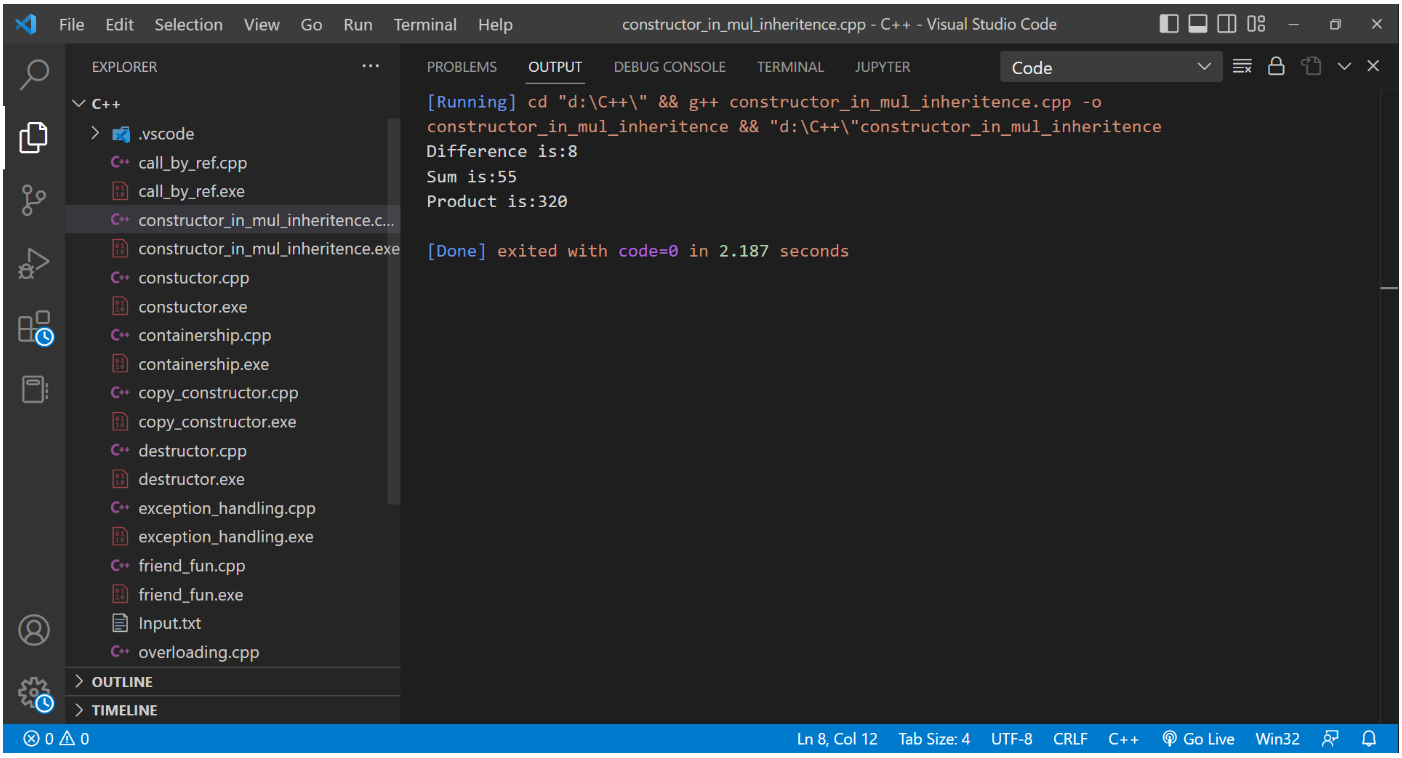
```
[Running] cd "d:\C++\" && g++ destructor.cpp -o destructor && "d:\C++\"destructor

 No. of Object created: 1
 No. of Object created: 2
 No. of Object created: 3
 No. of Object created: 4
 No. of Object destroyed:   4
 No. of Object destroyed:   3
 No. of Object destroyed:   2
 No. of Object destroyed:   1
[Done] exited with code=0 in 1.134 seconds
```

6. WAP to show the usage of constructor in base and derived classes, in multiple inheritance.

CODE: -

```
// C++ program to implement
// constructors in multiple
// inheritance
#include<iostream>
using namespace std;
class A1
{
    public:
        A1()
        {
            int a = 20, b = 35, c;
            c = a + b;
            cout << "Sum is:" <<
                    c << endl;
        }
};

class A2
{
    public:
        A2()
        {
            int x = 50, y = 42, z;
            z = x - y;
            cout << "Difference is:" <<
                    z << endl;
        }
};

class S: public A1,virtual A2
{
    public:
        S(): A1(), A2()
        {
            int r = 40, s = 8, t;
            t = r * s;
            cout << "Product is:" <<
                    t << endl;
        }
};

// Driver code
int main()
{
    S obj;
    return 0;
}
```

OUTPUT: -



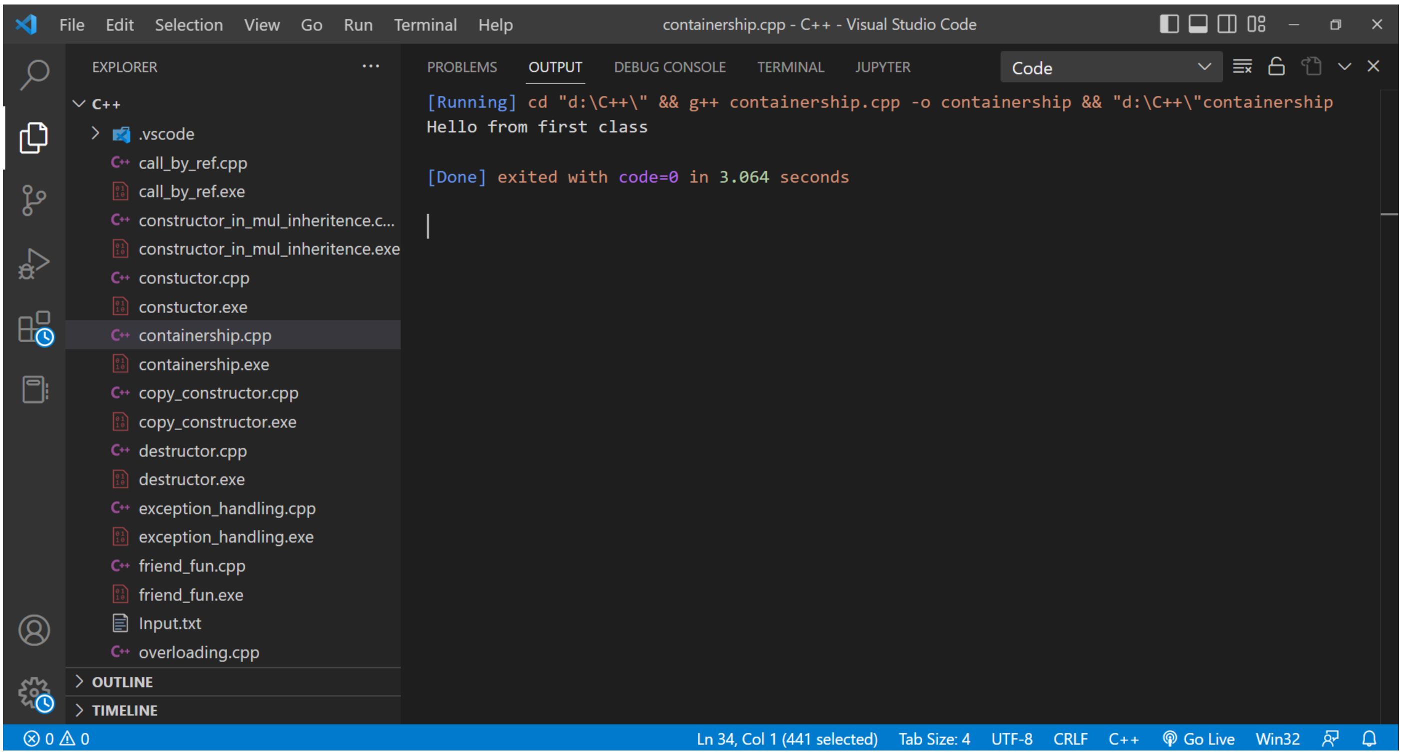
```
[Running] cd "d:\C++\" && g++ constructor_in_mul_inheritence.cpp -o
constructor_in_mul_inheritence && "d:\C++\"constructor_in_mul_inheritence
Difference is:8
Sum is:55
Product is:320

[Done] exited with code=0 in 2.187 seconds
```

7. WAP to show the implementation of ‘containership’.

CODE: -

```
// CPP program to illustrate
// concept of Containership

#include <iostream>
using namespace std;

class first {
public:
    void showf()
    {
        cout << "Hello from first class\n";
    }
};

// Container class
class second {
    // creating object of first
    first f;

public:
    // constructor
    second()
    {
        // calling function of first class
        f.showf();
    }
};

int main()
{
    // creating object of second
    second s;
}
```

OUTPUT: -



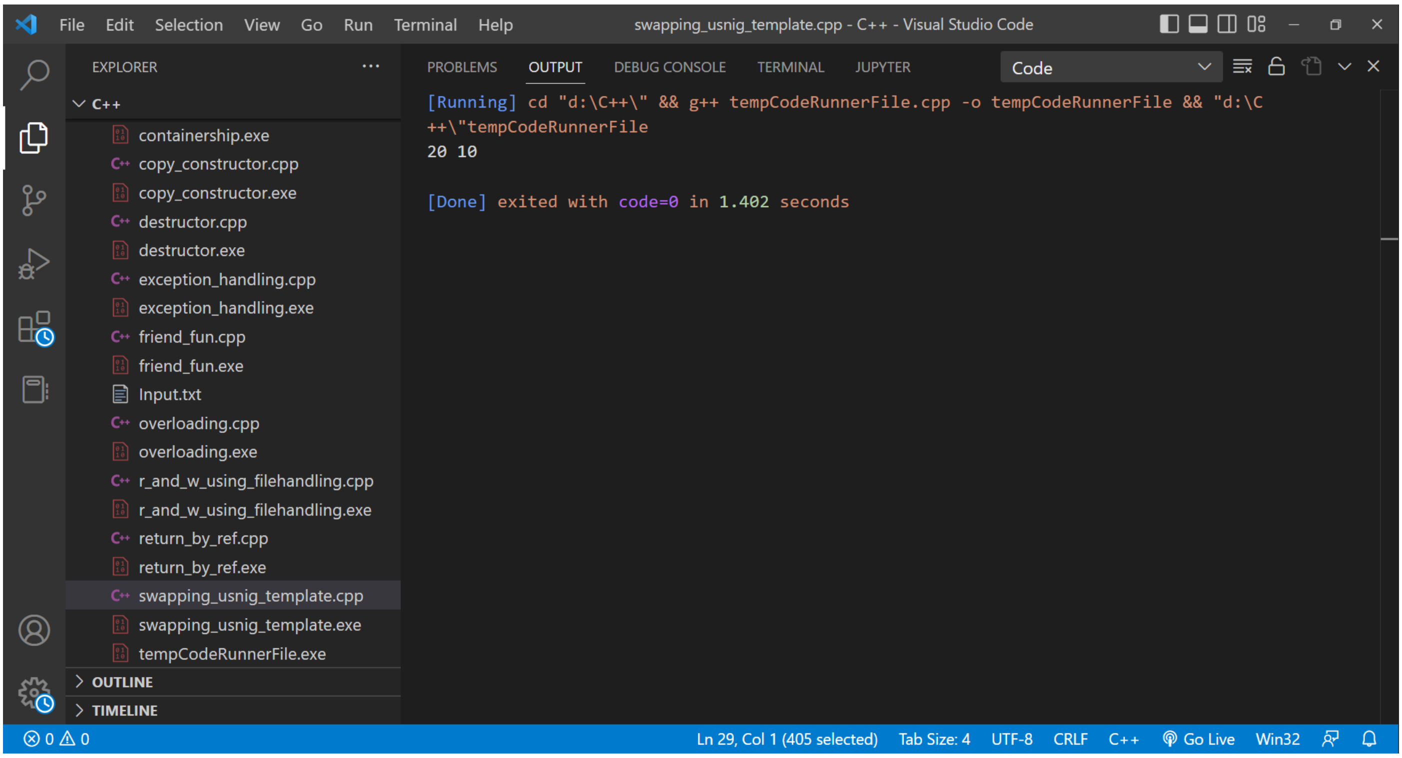
```
[Running] cd "d:\C++\" && g++ containership.cpp -o containership && "d:\C++\"containership
Hello from first class

[Done] exited with code=0 in 3.064 seconds
```

8. WAP to show swapping using template function (Generic).

CODE: -

```
// C++ program to implement
// function templates
#include <iostream>
using namespace std;

// Function template to swap
// two numbers
template <class T>
int swap_numbers(T& x, T& y)
{
    T t;
    t = x;
    x = y;
    y = t;
    return 0;
}

// Driver code
int main()
{
    int a, b;
    a = 10, b = 20;

    // Invoking the swap()
    swap_numbers(a, b);
    cout << a << " " << b << endl;
    return 0;
}
```

OUTPUT: -



File Edit Selection View Go Run Terminal Help
swapping_usnig_template.cpp - C++ - Visual Studio Code
EXPLORER
C++
containership.exe
copy_constructor.cpp
copy_constructor.exe
destructor.cpp
destructor.exe
exception_handling.cpp
exception_handling.exe
friend_fun.cpp
friend_fun.exe
Input.txt
overloading.cpp
overloading.exe
r_and_w_using_filehandling.cpp
r_and_w_using_filehandling.exe
return_by_ref.cpp
return_by_ref.exe
swapping_usnig_template.cpp
swapping_usnig_template.exe
tempCodeRunnerFile.exe
OUTLINE
TIMELINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
Code
⊗ 0 ⚠ 0
Ln 29, Col 1 (405 selected) Tab Size: 4 UTF-8 CRLF C++ Go Live Win32

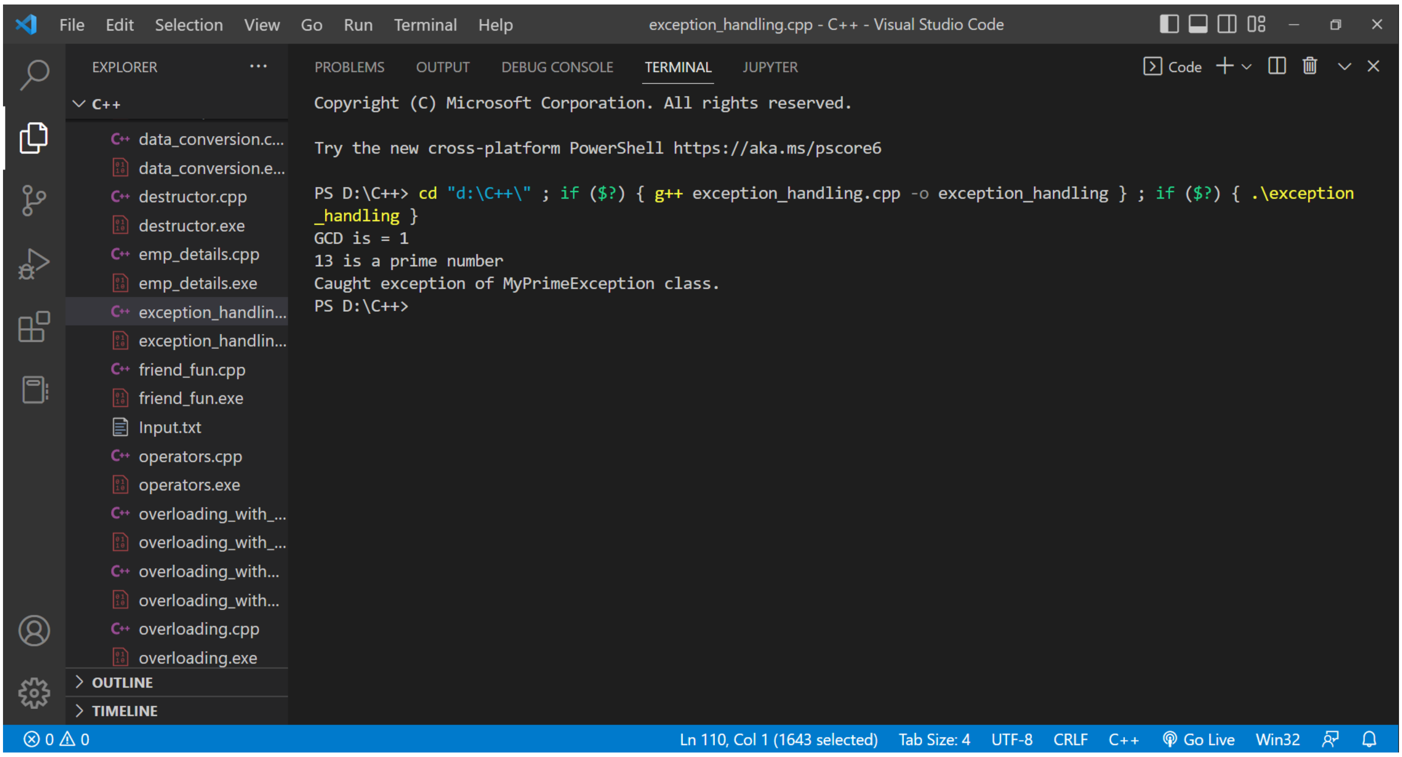
```
[Running] cd "d:\C++\" && g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile && "d:\C
++\"tempCodeRunnerFile
20 10

[Done] exited with code=0 in 1.402 seconds
```

9. WAP to implement ‘Exception Handling’.

CODE: -

```
// C++ program to illustrate the concept
// of exception handling using class

#include <bits/stdc++.h>
using namespace std;

// Class declaration
class Number {
private:
    int a, b;

public:
    // Constructors
    Number(int x, int y)
    {
        a = x;
        b = y;
    }

    // Function that find the GCD
    // of two numbers a and b
    int gcd()
    {
        // While a is not equal to b
        while (a != b) {

            // Update a to a - b
            if (a > b)
                a = a - b;

            // Otherwise, update b
            else
                b = b - a;
        }

        // Return the resultant GCD
        return a;
    }

    // Function to check if the
    // given number is prime
    bool isPrime(int n)
    {
        // Base Case
        if (n <= 1)
            return false;

        // Iterate over the range [2, N]
        for (int i = 2; i < n; i++) {

            // If n has more than 2
            // factors, then return
            // false
            if (n % i == 0)
                return false;
        }

        // Return true
        return true;
    }
};

// Empty class
class MyPrimeException {
};

// Driver Code
int main()
{
    int x = 13, y = 56;

    Number num1(x, y);

    // Print the GCD of X and Y
    cout << "GCD is = "
        << num1.gcd() << endl;

    // If X is prime
    if (num1.isPrime(x))
        cout << x
            << " is a prime number"
            << endl;

    // If Y is prime
    if (num1.isPrime(y))
        cout << y
            << " is a prime number"
            << endl;

    // Exception Handling
    if ((num1.isPrime(x))
        || (num1.isPrime(y))) {

        // Try Block
        try {
            throw MyPrimeException();
        }

        // Catch Block
        catch (MyPrimeException t) {

            cout << "Caught exception "
                << "of MyPrimeException "
                << "class." << endl;
        }
    }

    return 0;
}
```

OUTPUT: -



```
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ exception_handling.cpp -o exception_handling } ; if ($?) { .\exception
_handling }
GCD is = 1
13 is a prime number
Caught exception of MyPrimeException class.
PS D:\C++>
```

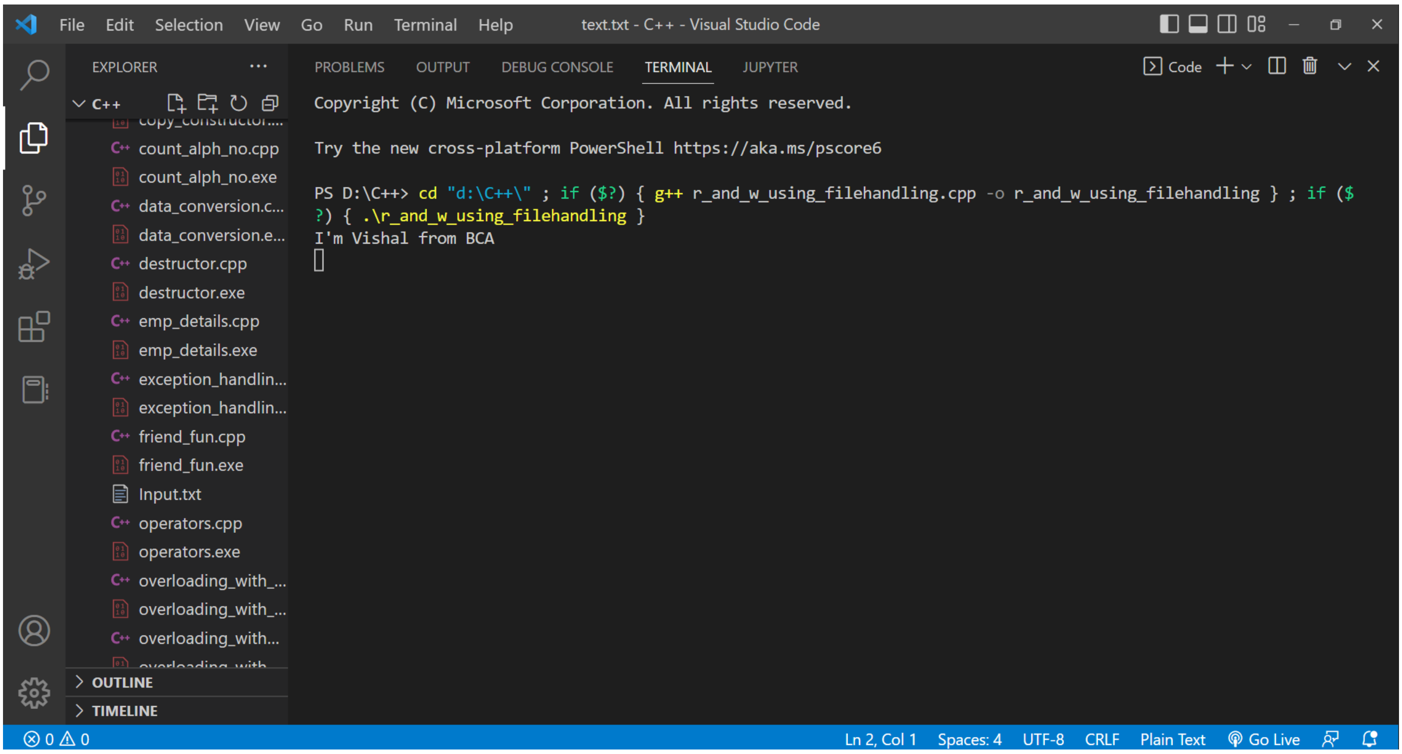
⊗ 0 ⚠ 0
Ln 110, Col 1 (1643 selected) Tab Size: 4 UTF-8 CRLF C++ Go Live Win32

10.WAP to read and write values through object using file handling.

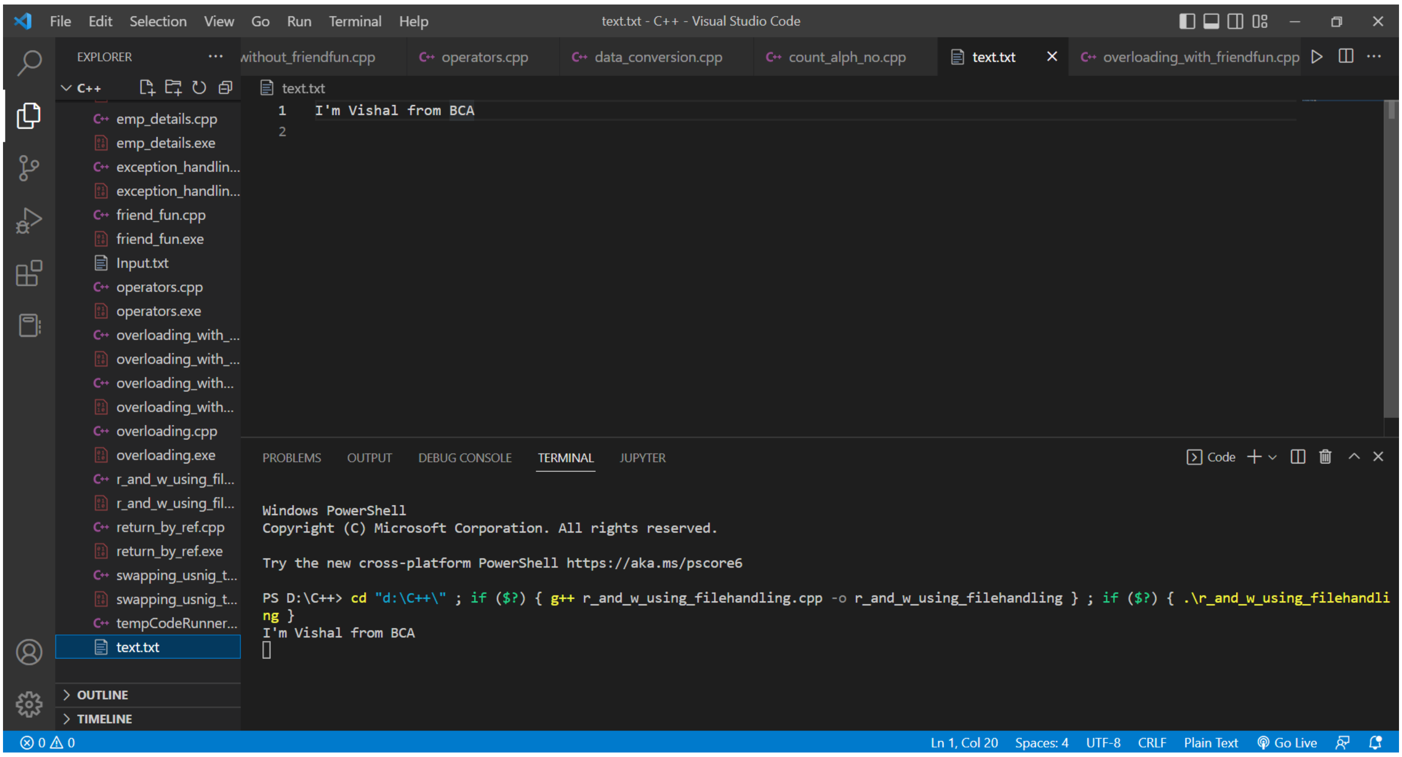
CODE: -

```
/* File Handling with C++ using ifstream & ofstream class object*/
/* To write the Content in File*/
/* Then to read the content of file*/
#include <iostream>

/* fstream header file for ifstream, ofstream,
fstream classes */
#include <fstream>

using namespace std;

// Driver Code
int main()
{
    // Creation of ofstream class object
    ofstream fout;

    string line;

    // by default ios::out mode, automatically deletes
    // the content of file. To append the content, open in ios:app
    // fout.open("sample.txt", ios::app)
    fout.open("text.txt");

    // Execute a loop If file successfully opened
    while (fout) {

        // Read a Line from standard input
        getline(cin, line);

        // Press -1 to exit
        if (line == "-1")
            break;

        // Write line in file
        fout << line << endl;
    }

    // Close the File
    fout.close();

    // Creation of ifstream class object to read the file
    ifstream fin;

    // by default open mode = ios::in mode
    fin.open("text.txt");

    // Execute a loop until EOF (End of File)
    while (getline(fin, line)) {

        // Print line (read from file) in Console
        cout << line << endl;
    }

    // Close the file
    fin.close();

    return 0;
}
```

OUTPUT: -



```
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ r_and_w_using_filehandling.cpp -o r_and_w_using_filehandling } ; if ($
?) { .\r_and_w_using_filehandling }
I'm Vishal from BCA
```



text.txt

```
I'm Vishal from BCA
```

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ r_and_w_using_filehandling.cpp -o r_and_w_using_filehandling } ; if ($?) { .\r_and_w_using_filehandli
ng }
I'm Vishal from BCA
```

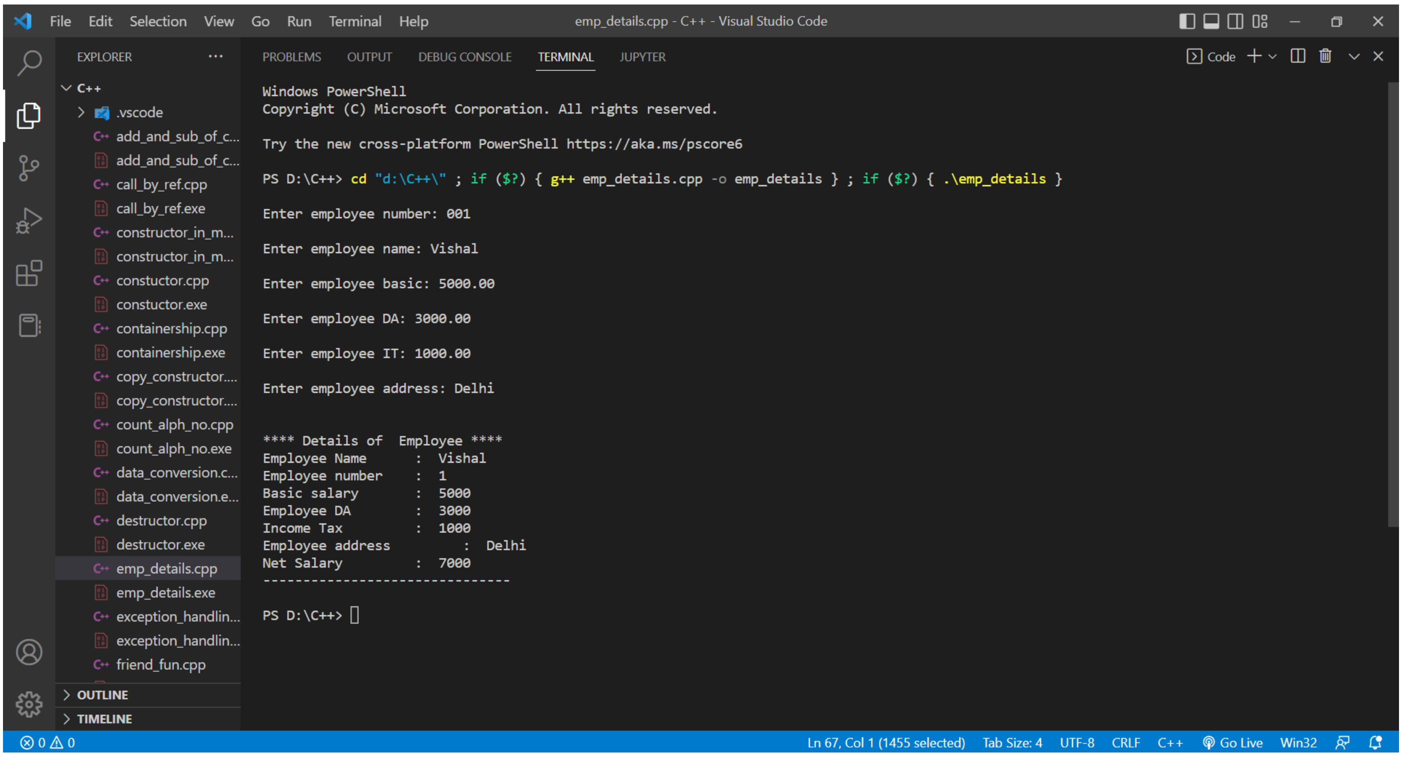
11. Create a class employee which have name, age and address of employee, include functions getdata() and showdata(), getdata() takes the input from the user, showdata() display the data in following format:

Name:
Age:
Address:

CODE: -

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

using namespace std;

class employee
{
   int   emp_number;
   char  emp_name[20];
   float emp_basic;
   float emp_da;
   float emp_it;
   float emp_net_sal;
   char emp_address[50];

   public:

       void get_emp_details();
       float find_net_salary(float basic, float da, float it);
       void show_emp_details();
};

void employee :: get_emp_details()
{
   cout<<"\nEnter employee number: ";
   cin>>emp_number;
   cout<<"\nEnter employee name: ";
   cin>>emp_name;
   cout<<"\nEnter employee basic: ";
   cin>>emp_basic;
   cout<<"\nEnter employee DA: ";
   cin>>emp_da;
   cout<<"\nEnter employee IT: ";
   cin>>emp_it;
   cout<<"\nEnter employee address: ";
   cin>>emp_address;
}

float employee :: find_net_salary(float basic, float da, float it)
{
   return (basic+da)-it;
}

void employee :: show_emp_details()
{
   cout<<"\n\n**** Details of  Employee ****";
   cout<<"\nEmployee Name      :  "<<emp_name;
   cout<<"\nEmployee number    :  "<<emp_number;
   cout<<"\nBasic salary       :  "<<emp_basic;
   cout<<"\nEmployee DA        :  "<<emp_da;
   cout<<"\nIncome Tax         :  "<<emp_it;
   cout<<"\nEmployee address         :  "<<emp_address;
   cout<<"\nNet Salary         :  "<<find_net_salary(emp_basic, emp_da, emp_it);
   cout<<"\n-------------------------------\n\n";
}

int main()
{
   employee emp;

   emp.get_emp_details();
   emp.show_emp_details();

   return 0;
}
```

OUTPUT: -



```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

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

Enter employee number: 001

Enter employee name: Vishal

Enter employee basic: 5000.00

Enter employee DA: 3000.00

Enter employee IT: 1000.00

Enter employee address: Delhi


**** Details of  Employee ****
Employee Name       :  Vishal
Employee number     :  1
Basic salary        :  5000
Employee DA         :  3000
Income Tax          :  1000
Employee address          :  Delhi
Net Salary          :  7000
-------------------------------

PS D:\C++> 
```

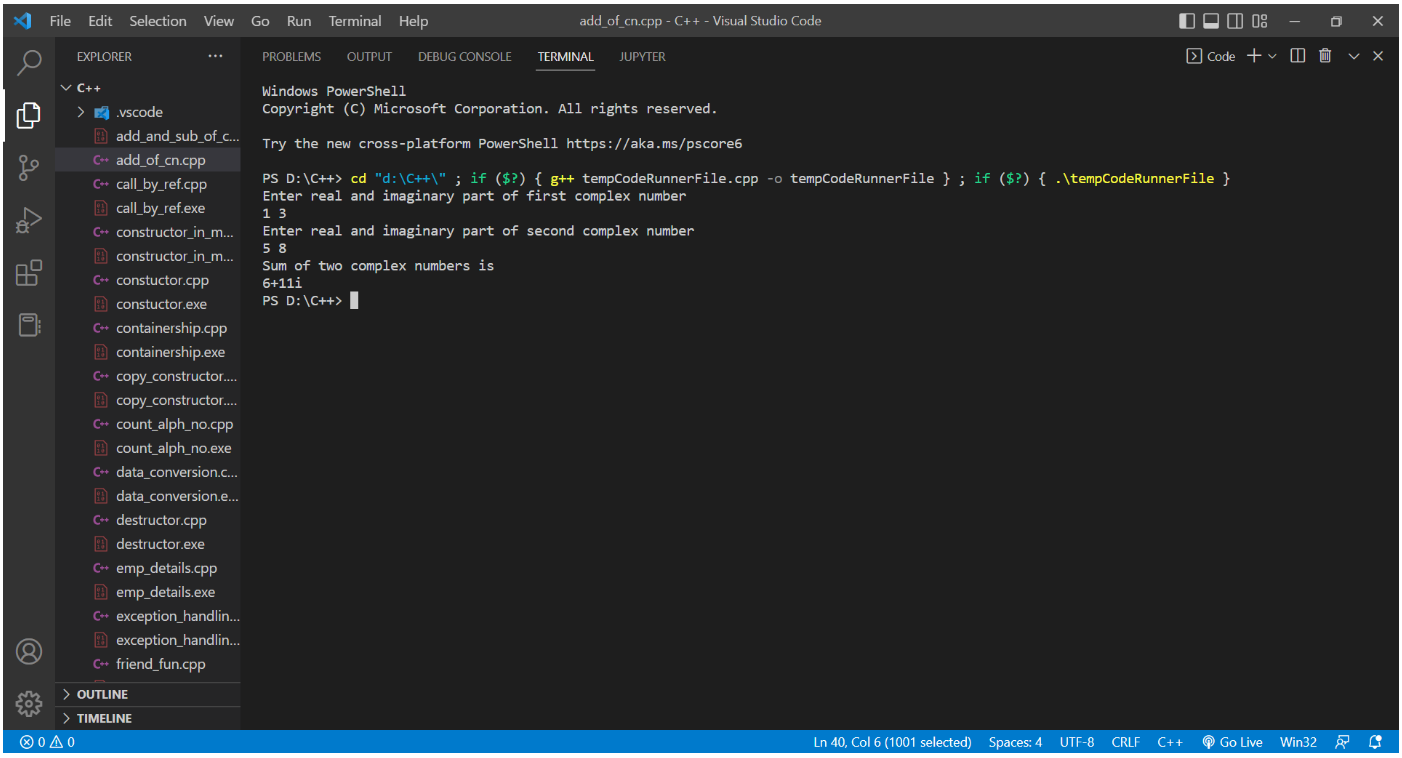
12.WAP to add and subtract two complex numbers using classes.

CODE: -

i.

```
/* C++ Program to add two Complex Numbers */
#include<iostream>
using namespace std;
class Complex{
public:
    int real;
    int imag;
     /* Function to set the values of
      * real and imaginary part of each complex number
      */
     void setvalue()
    {
        cin>>real;
        cin>>imag;
    }
   /* Function to display the sum of two complex numbers */
    void display()
    {
        cout<<real<<"+"<<imag<<"i"<<endl;
    }
   /* Function to add two complex numbers */

    void sum(Complex c1, Complex c2)
    {
        real=c1.real+c2.real;
        imag=c1.imag+c2.imag;
    }
    };
int main()
    {
        Complex c1,c2,c3;
        cout<<"Enter real and imaginary part of first complex number"<<endl;
        c1.setvalue();
        cout<<"Enter real and imaginary part of second complex number"<<endl;
        c2.setvalue();
        cout<<"Sum of two complex numbers is"<<endl;
        c3.sum(c1,c2);
        c3.display();
    return 0;
    }
```

OUTPUT: -

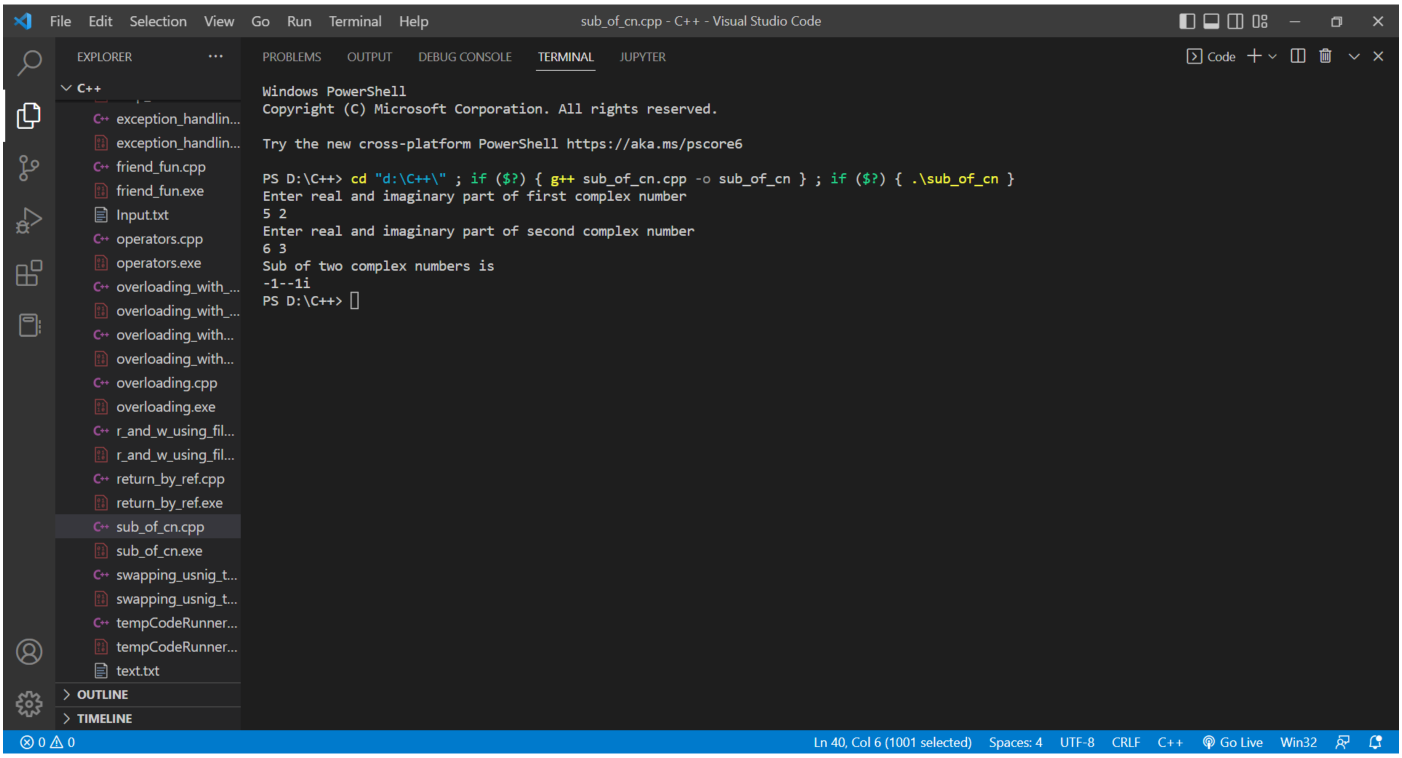


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter real and imaginary part of first complex number
1 3
Enter real and imaginary part of second complex number
5 8
Sum of two complex numbers is
6+11i
PS D:\C++> 
```

ii.

```
/* C++ Program to sub two Complex Numbers */
#include<iostream>
using namespace std;
class Complex{
public:
   int real;
   int imag;
    /* Function to set the values of
     * real and imaginary part of each complex number
     */
    void setvalue()
   {
      cin>>real;
      cin>>imag;
   }
   /* Function to display the sub of two complex numbers */
   void display()
   {
      cout<<real<<"-"<<imag<<"i"<<endl;
   }
   /* Function to sub two complex numbers */

   void sub(Complex c1, Complex c2)
   {
      real=c1.real-c2.real;
      imag=c1.imag-c2.imag;
   }
   };
int main()
   {
      Complex c1,c2,c3;
      cout<<"Enter real and imaginary part of first complex number"<<endl;
      c1.setvalue();
      cout<<"Enter real and imaginary part of second complex number"<<endl;
      c2.setvalue();
      cout<<"Sub of two complex numbers is"<<endl;
      c3.sub(c1,c2);
      c3.display();
   return 0;
   }
```

OUTPUT: -



```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ sub_of_cn.cpp -o sub_of_cn } ; if ($?) { .\sub_of_cn }
Enter real and imaginary part of first complex number
5 2
Enter real and imaginary part of second complex number
6 3
Sub of two complex numbers is
-1--1i
PS D:\C++> 
```

13. Write program to overload Binary + to add two similar types of objects. (Both with and without using friend functions).

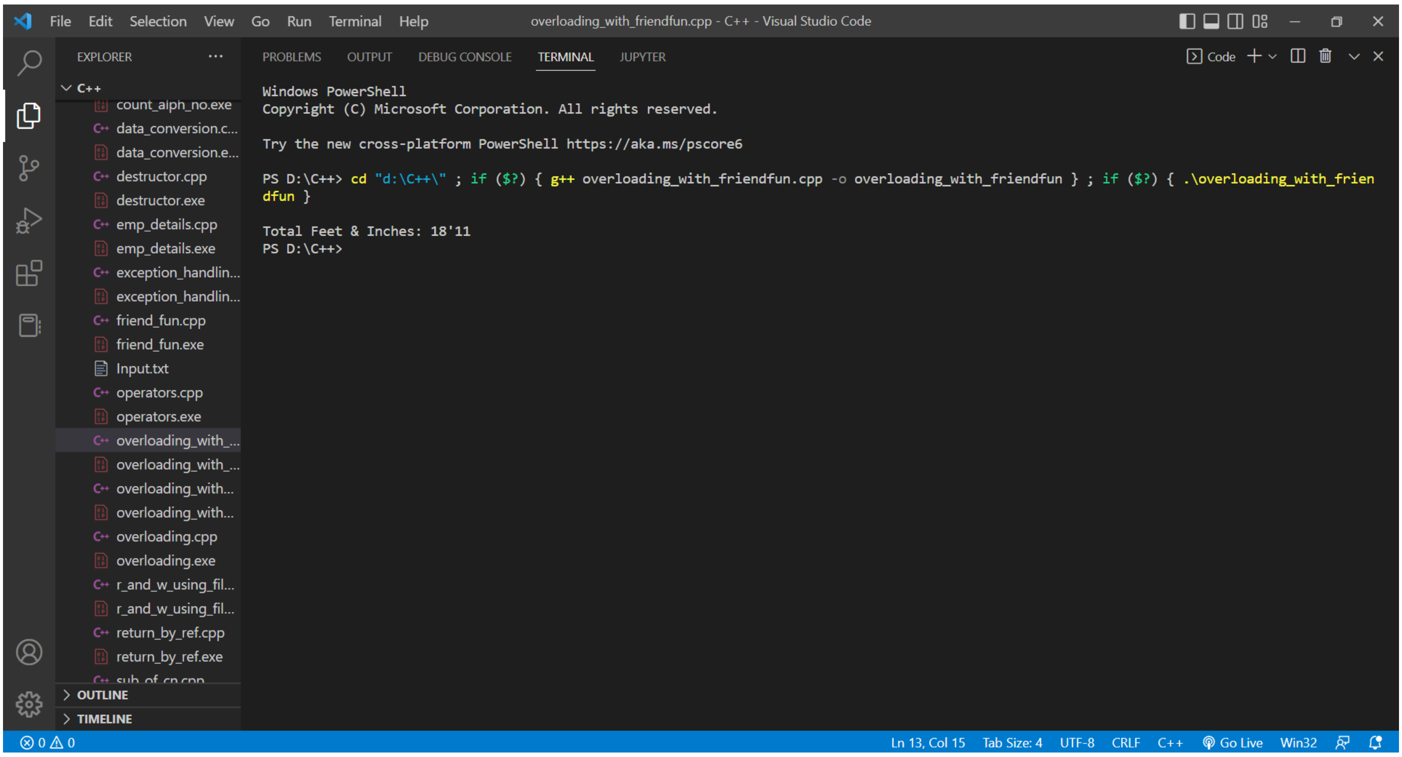
CODE: -

i.

```
// C++ program to show binary operator overloading
#include <iostream>

using namespace std;

class Distance {
public:

    // Member Object
    int feet, inch;

    // No Parameter Constructor
    Distance()
    {
        this->feet = 0;
        this->inch = 0;
    }

    // Constructor to initialize the object's value
    // Parameterized Constructor
    Distance(int f, int i)
    {
        this->feet = f;
        this->inch = i;
    }

    // Declaring friend function using friend keyword
    friend Distance operator+(Distance&, Distance&);
};

// Implementing friend function with two parameters
Distance operator+(Distance& d1, Distance& d2) // Call by reference
{
    // Create an object to return
    Distance d3;

    // Perform addition of feet and inches
    d3.feet = d1.feet + d2.feet;
    d3.inch = d1.inch + d2.inch;

    // Return the resulting object
    return d3;
}

// Driver Code
```

```
int main()
{
    // Declaring and Initializing first object
    Distance d1(8, 9);

    // Declaring and Initializing second object
    Distance d2(10, 2);

    // Declaring third object
    Distance d3;

    // Use overloaded operator
    d3 = d1 + d2;

    // Display the result
    cout << "\nTotal Feet & Inches: " << d3.feet << "'" << d3.inch;
    return 0;
}
```

OUTPUT: -

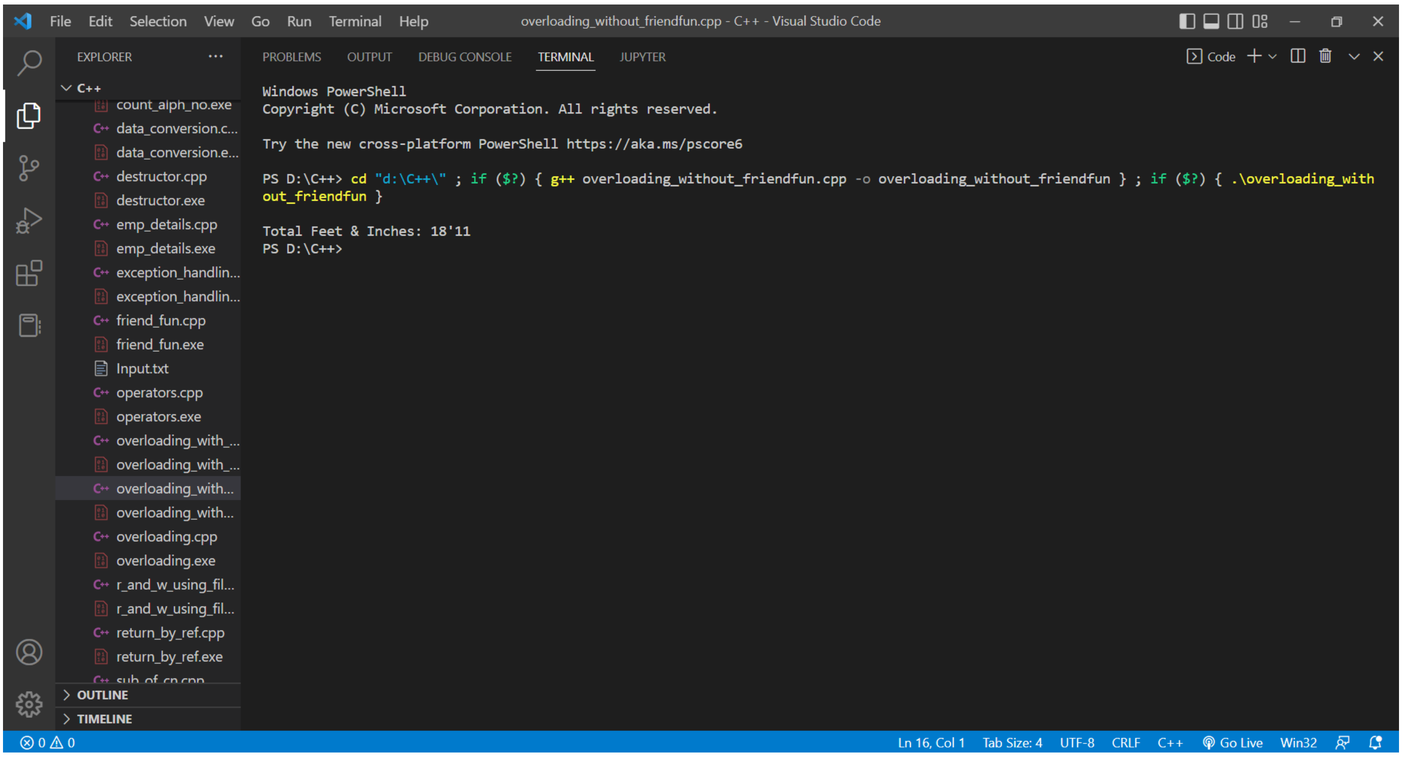


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ overloading_with_friendfun.cpp -o overloading_with_friendfun } ; if ($?) { .\overloading_with_frien
dfun }

Total Feet & Inches: 18'11
PS D:\C++>
```

ii.

```
// C++ program to show binary operator overloading
#include <iostream>

using namespace std;

class Distance {
public:
    // Member Object
    int feet, inch;
    // No Parameter Constructor
    Distance()
    {
        this->feet = 0;
        this->inch = 0;
    }

    // Constructor to initialize the object's value
    // Parameterized Constructor
    Distance(int f, int i)
    {
        this->feet = f;
        this->inch = i;
    }

    // Overloading (+) operator to perform addition of
    // two distance object
    Distance operator+(Distance& d2) // Call by reference
    {
        // Create an object to return
        Distance d3;

        // Perform addition of feet and inches
        d3.feet = this->feet + d2.feet;
        d3.inch = this->inch + d2.inch;

        // Return the resulting object
        return d3;
    }
};

// Driver Code
int main()
{
    // Declaring and Initializing first object
    Distance d1(8, 9);

    // Declaring and Initializing second object
    Distance d2(10, 2);

    // Declaring third object
    Distance d3;

    // Use overloaded operator
    d3 = d1 + d2;

    // Display the result
    cout << "\nTotal Feet & Inches: " << d3.feet << "" << d3.inch;
    return 0;
}
```

OUTPUT: -



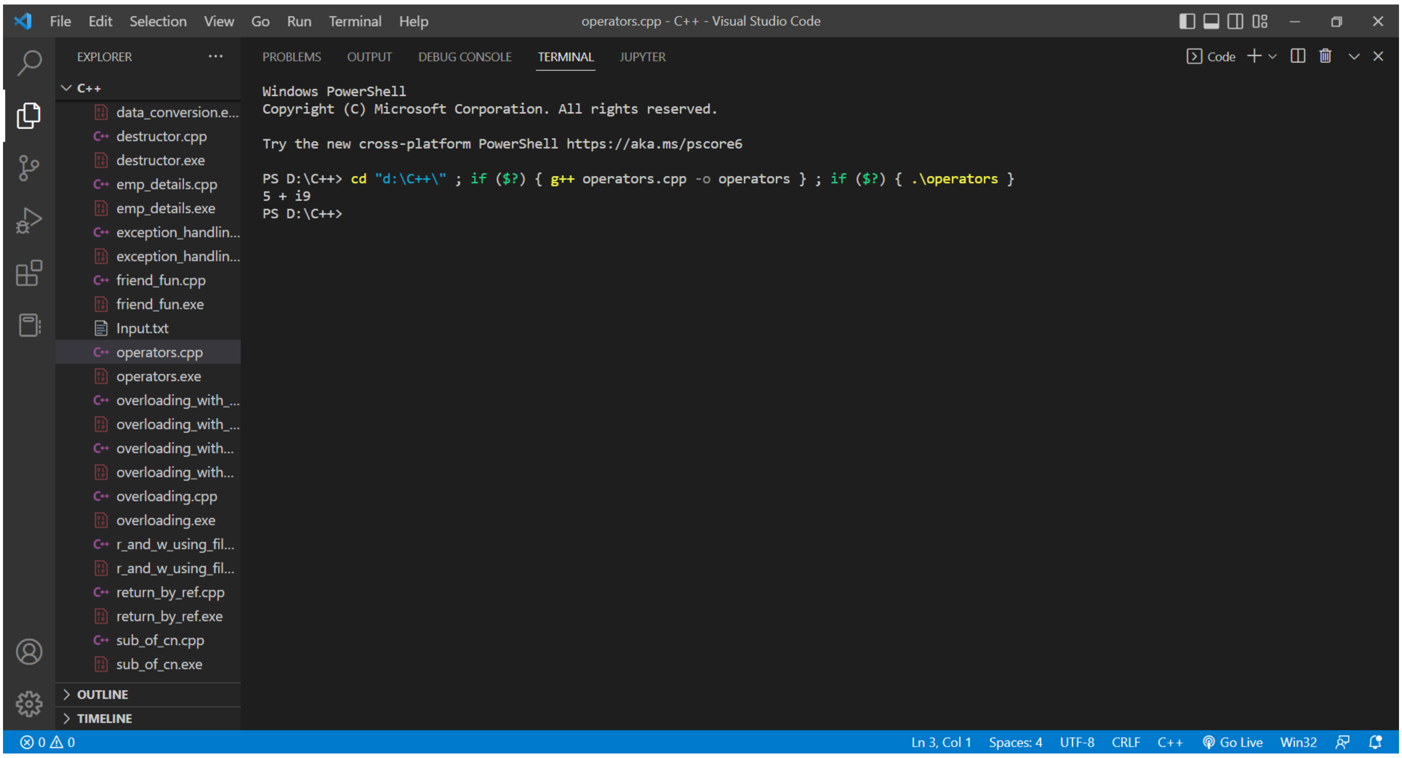
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ overloading_without_friendfun.cpp -o overloading_without_friendfun } ; if ($?) { .\overloading_with
out_friendfun }

Total Feet & Inches: 18'11
PS D:\C++>
```

14.WAP to implement += and = operator.

CODE: -

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

class ComplexNumber{
private:
int real;
int imaginary;
public:
ComplexNumber(int real, int imaginary){
    this->real = real;
    this->imaginary = imaginary;
}
void print(){
    cout<<real<<" + i"<<imaginary;
}
ComplexNumber operator+ (ComplexNumber c2){
    ComplexNumber c3(0,0);
    c3.real = this->real+c2.real;
    c3.imaginary = this->imaginary + c2.imaginary;
    return c3;
}
};
int main() {
    ComplexNumber c1(3,5);
    ComplexNumber c2(2,4);
    ComplexNumber c3 = c1 + c2;
    c3.print();
    return 0;
}
```

OUTPUT: -



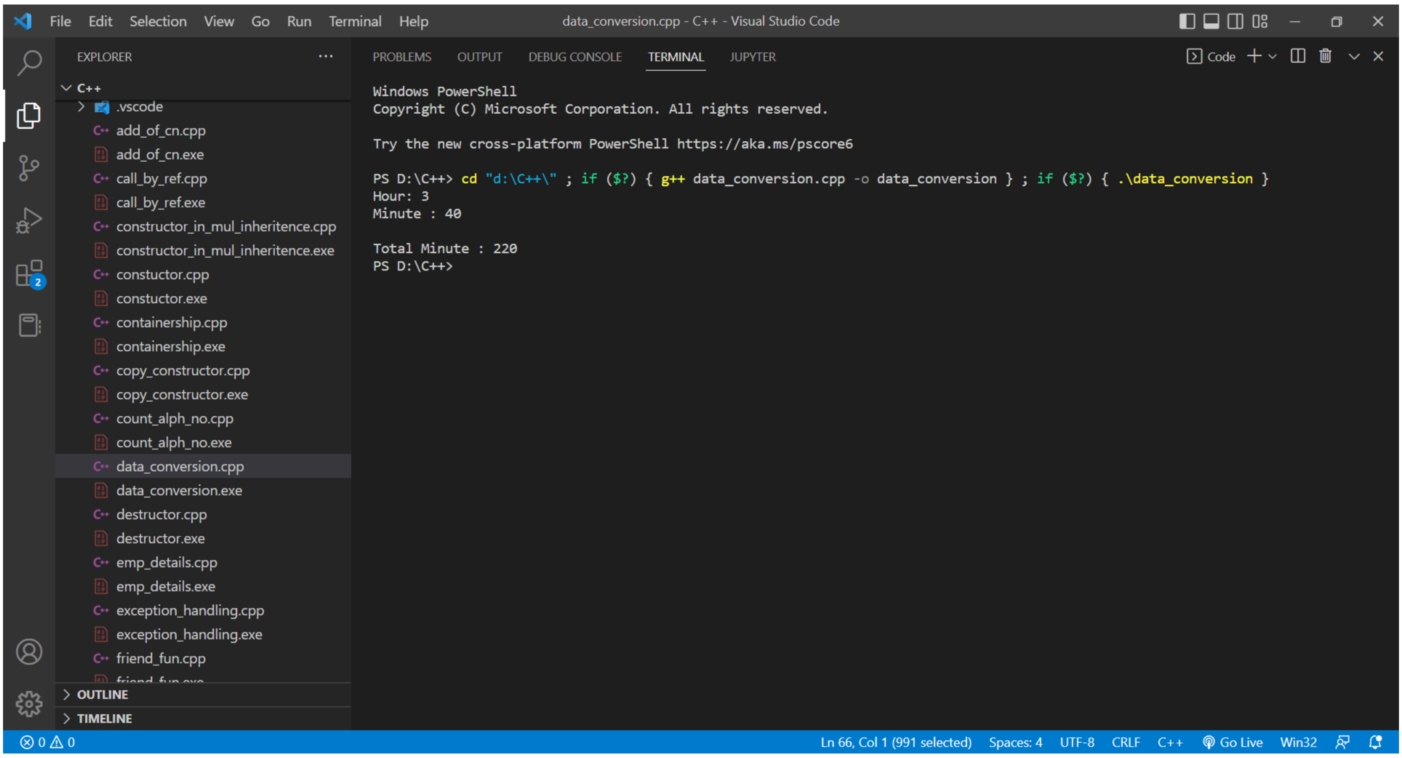
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ operators.cpp -o operators } ; if ($?) { .\operators }
5 + i9
PS D:\C++>
```

15.WAP to convert meter to centimetre and vice versa, using data conversions and operator overloading.

CODE: -

```
// C++ program to illustrate the
// above conversion
#include <bits/stdc++.h>
using namespace std;
//minutes class
class Minute {


public:
int mins;
    // Constructors
    Minute()
    {
        mins = 0;
    }

    // Function to print the value of
    // hours and minutes
    void show()
    {
        cout << "\nTotal Minute : " << mins << endl;
    }
};

// Time Class
class Time {
    int hr, mins;

public:
    // Constructors
    Time(int h, int m)
    {
        hr = h;
        mins = m;
    }
    Time()
    {
        cout << "\nTime's Object Created";
    }
    operator Minute () //overloading minute class
    {
        Minute m;
        m.mins = (hr * 60) + mins;
        return m;
    } //driver code

    // Function to print the value of
    // hours and minutes
    void show()
    {
        cout << "Hour: " << hr << endl;
        cout << "Minute : " << mins << endl;
    }
};

// Minutes Class
int main()
{
    Time T1(3,40);
    Minute m;
    m=T1; //minute class is destination and Time class is source class
    T1.show();
    m.show();
    return 0;
}
```

OUTPUT: -



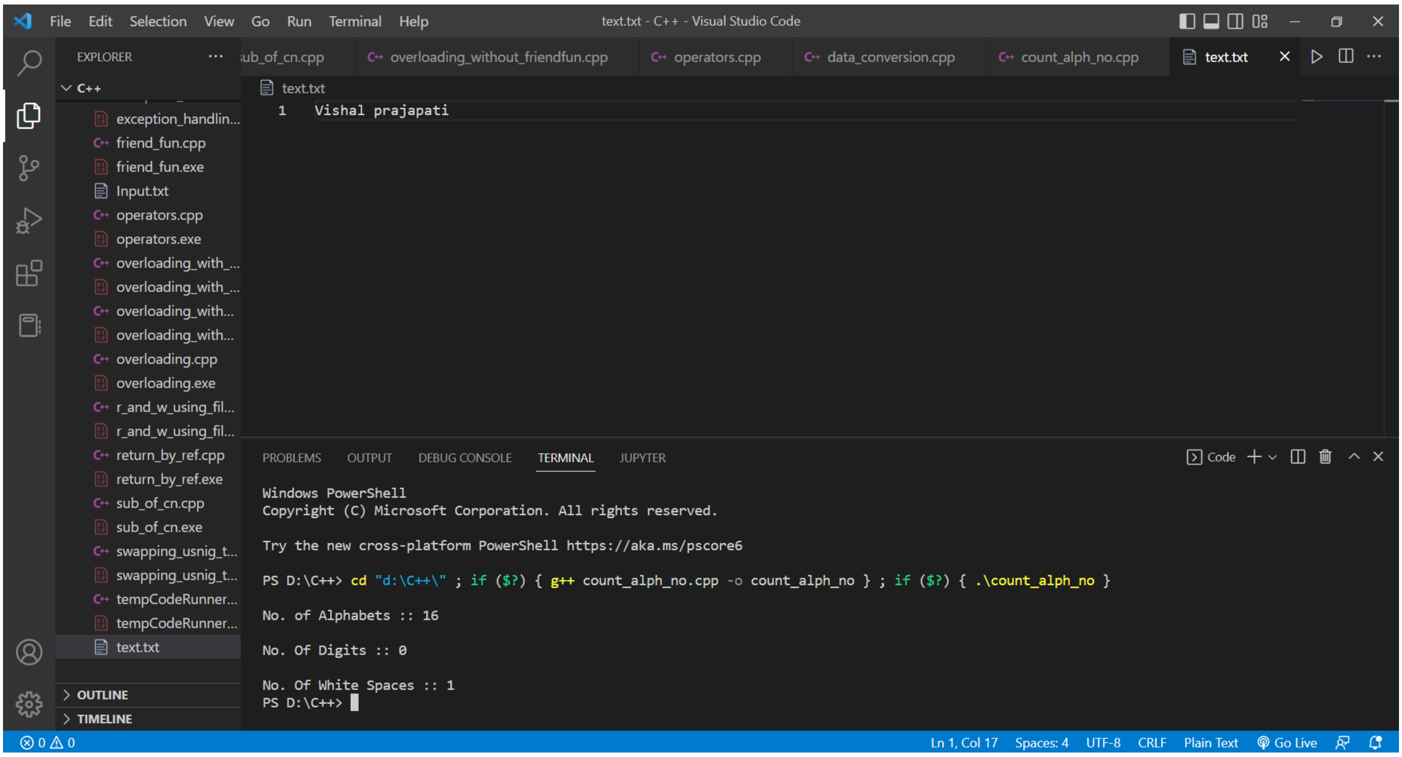
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\C++> cd "d:\C++\" ; if ($?) { g++ data_conversion.cpp -o data_conversion } ; if ($?) { .\data_conversion }
Hour: 3
Minute : 40

Total Minute : 220
PS D:\C++>
```

16.WAP to count digits, alphabets and spaces, stored in a text file, using streams.

CODE: -

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

int main()
{

   ifstream fin("text.txt");
   char ch;
   int i,a=0,s=0,d=0;

   while(fin)
   {
      fin.get(ch);
      i=ch;
      if(i>63 && i<91 || i>96 && i<123)
         a++;
      else
         if(ch==' ')
            s++;
      else
         if(i>47&&i<58)
            d++;
   }

   cout<<"\nNo. of Alphabets :: "<<a<<"\n";
   cout<<"\nNo. Of Digits :: "<<d<<"\n";
   cout<<"\nNo. Of White Spaces :: "<<s<<"\n";

   return 0;
}
```

OUTPUT: -



text.txt

```
Vishal prajapati
```

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

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

No. of Alphabets :: 16

No. Of Digits :: 0

No. Of White Spaces :: 1
PS D:\C++> 
```