

Assignment :- 5

IT613-Programming

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1).

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

```
using namespace std;
```

```
int main()
```

```
{
```

```
    string s;
```

```
    getline(cin,s);
```

```
    map<char,int> ans;
```

```
    for(int i=0;i<s.size();i++){
```

```
        ans[s[i]]++;
```

```
    }
```

```
    for(auto i : ans){
```

```
        cout<<i.first <<"-> " <<i.second<<endl;
```

```
    }
```

```
}
```

The screenshot shows a web browser window with the URL `onlinegdb.com/online_c++_compiler`. The browser tabs include "Online C++ Compiler - online...", "(277) YouTube", and "Gaza Hospital Attack | Huge Pro...". The compiler interface has a top bar with buttons for "Run", "Debug", "Stop", "Share", "Save", and "Beautify". The language is set to "C++". The code editor shows a file named `main.cpp` with the following C++ code:

```
1 #include <bits/stdc++.h>
2
3 using namespace std;
4
5 int main()
6 {
7     string s;
8     getline(cin,s);
9     map<char,int> ans;
10    for(int i=0;i<s.size();i++){
11        ans[s[i]]++;
12    }
13    for(auto i : ans){
14        cout<<i.first <<"-> " <<i.second<<endl;
15    }
16 }
17
```

Below the code editor is an "input" field and an "output" window. The input field contains the text "Jivan Rajpurohit". The output window shows the following results:

```
Jivan Rajpurohit
-> 1
J-> 1
R-> 1
a-> 2
h-> 1
i-> 2
j-> 1
n-> 1
o-> 1
p-> 1
r-> 1
```

The Windows taskbar at the bottom shows the system clock as 5:52 PM on 18-Oct-23, with a temperature of 34°C and weather "Mostly sunny".

2).

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

```
using namespace std;
```

```
int main()
```

```
{
```

```
    string s;
```

```
    getline(cin,s);
```

```
    map<char,int> ans;
```

```
    for(int i=0;i<s.size();i++){
```

```
        ans[s[i]]++;
```

```
    }
```

```
    for(auto i : ans){
```

```
        cout<<i.first;
```

```
    }
```

```
}
```

The screenshot shows a web browser window with the URL `onlinegdb.com/online_c++_compiler`. The browser has several tabs open, including "Online C++ Compiler - online...", "(277) YouTube", and "Gaza Hospital Attack | Huge Pro...". The compiler interface includes a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The language is set to C++. The code editor shows a file named `main.cpp` with the following C++ code:

```
1 #include <bits/stdc++.h>
2
3 using namespace std;
4
5 int main()
6 {
7     string s;
8     getline(cin,s);
9     map<char,int> ans;
10    for(int i=0;i<s.size();i++){
11        ans[s[i]]++;
12    }
13    for(auto i : ans){
14        cout<<i.first;
15    }
16 }
17
```

Below the code editor, the input/output section shows the input `Jeevan Rajpurohit` and `JRaehijnoprtuv`. The output section displays the message `...Program finished with exit code 0` and `Press ENTER to exit console.`. The Windows taskbar at the bottom shows the system clock as 6:00 PM on 18-Oct-23, with a temperature of 34°C and weather "Mostly sunny".

3).

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

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int n=5;
```

```
    string s1,s2,s3,s4,s5;
```

```
    cin>>s1;
```

```
    cin>>s2;
```

```
    cin>>s3;
```

```
    cin>>s4;
```

```
    cin>>s5;
```

```
    int max=0,len;
```

```
    int arr[5];
```

```
arr[0]=s1.size();
```

```
arr[1]=s2.size();
```

```
arr[2]=s3.size();
```

```
arr[3]=s4.size();
```

```
arr[4]=s5.size();
```

```
for(int i=0;i<5;i++){
```

```
    if(arr[i]>max){
```

```
        max=arr[i];
```

```
        len=i;
```

```
    }
```

```
}
```

```
switch (len){
```

```
case 0:
```

```
    cout<<arr[len]<<" "<<s1;
```

```
    break;
```

```
case 1:
```

```
    cout<<arr[len]<<" "<<s2;
```

```
    break;
```

```
case 2:
```

```
    cout<<arr[len]<<" "<<s3;
```

```
    break;
```

```
case 3:
```

```
    cout<<arr[len]<<" "<<s4;
```

```
    break;
```

```
case 4:
```

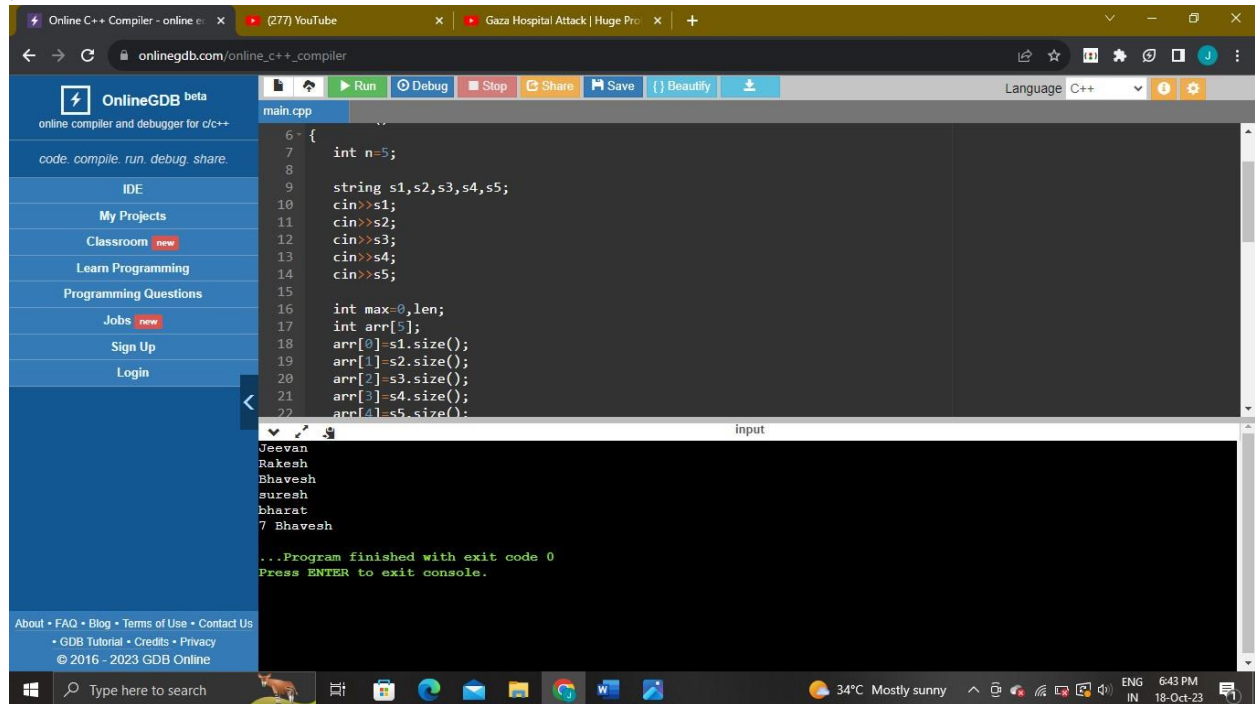
```
    cout<<arr[len]<<" "<<s5;
```

```
    break;
```

```
}
```

return 0;

}



4).

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

```
using namespace std;
```

```
int main()
```

```
{
```

```
int key[3][3][3], Pcode[3];
```

```
for (int i = 0; i < 3; i++)
```

```
{
```

```
for (int j = 0; j < 3; j++)
```

```
{
```

```
for (int k = 0; k < 3; k++)
```

```
{
```

```
cout << "key " << i << " " << j << " " << k << " =";
```

```
cin >> key[i][j][k];
```

```
}
```

```
}
```

```

}

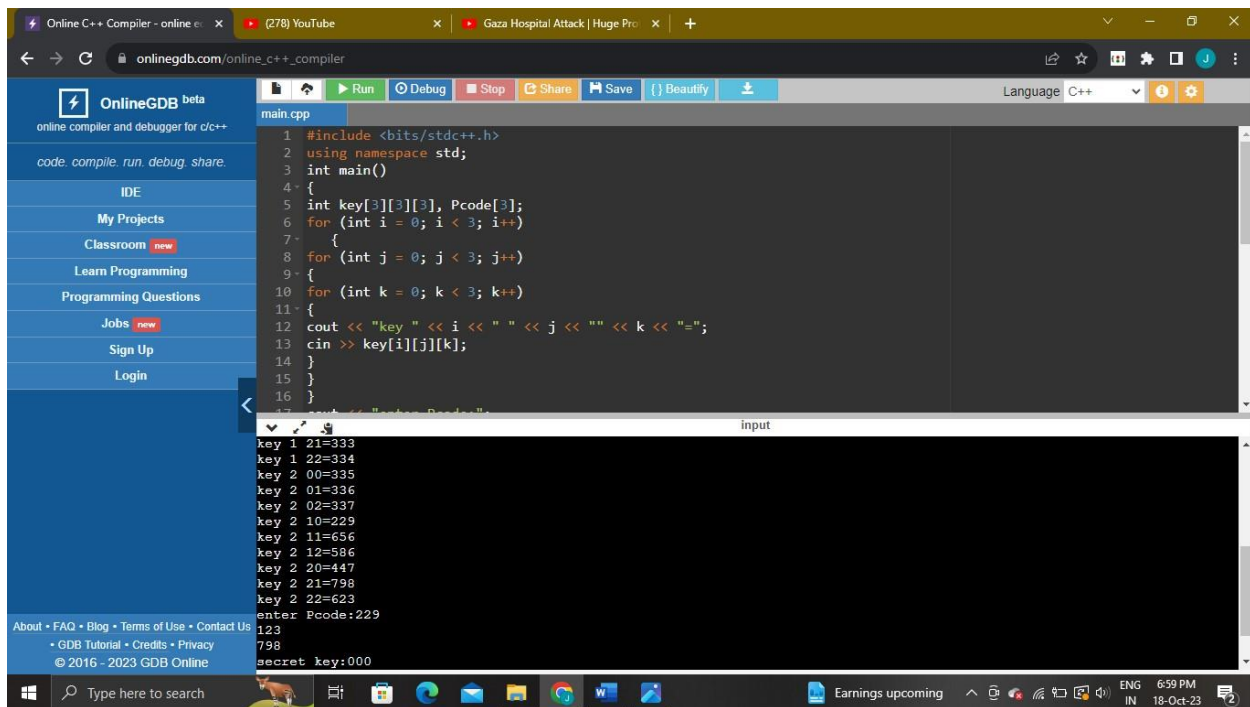
cout << "enter Pcode:";

for (int i = 0; i < 3; i++)
{
    int temp, count = 0;
    cin >> temp;
    for (int j = 0; j < 3; j++)
    {
        for (int k = 0; k < 3; k++)
        {
            if (count == temp)
            {
                Pcode[i] = key[i][j][k];
                break;
            }
            count++;
        }
    }
}

cout << "secret key:";
cout << Pcode[0];
cout << Pcode[1];
cout << Pcode[2];

return 0;
}

```



5).

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

```
using namespace std;
```

```
int main()
```

```
{
```

```
    string a[10];
```

```
    for (int i = 0; i < 10; i++)
```

```
    {
```

```
        getline(cin, a[i]);
```

```
    }
```

```
    for (int i = 0; i < 10; i++)
```

```
    {
```

```
        if (i % 2 == 0)
```

```
        {
```

```
            cout << a[i] << endl;
```

```
        }
```

```
    else
```

```
    {
```

```

        for (int j = 0; j < 20 - a[i].size(); j++)
        {
            cout << ' ';
        }

        cout << a[i] << endl;
    }
}

return 0;
}

```

6).

```

#include <bits/stdc++.h>

using namespace std;

struct player
{
    string firstname, lastname, gamename;

    int age;
};

int main()

```



```

{
    struct player p1;

    cout << "first_name:";

    cin >> p1.firstname;

    cout << "last_name:";

    cin >> p1.lastname;

    cout << "age:";

    cin >> p1.age;

    cout << "game name:";

    cin >> p1.gamename;


    cout << "first_name:" << p1.firstname << endl;
    cout << "last_name:" << p1.lastname << endl;
    cout << "age:" << p1.age << endl;
    cout << "game name:" << p1.gamename << endl;


    player *p2 = new player;

    cout << "first_name:";

    cin >> p2->firstname;

    cout << "last_name:";

    cin >> p2->lastname;

    cout << "age:";

    cin >> p2->age;

    cout << "game name:";

    cin >> p2->gamename;


    cout << "first_name:" << p2->firstname << endl;
    cout << "last_name:" << p2->lastname << endl;
    cout << "age:" << p2->age << endl;
    cout << "game name:" << p2->gamename << endl;

```

```

struct player p3[2];

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

    cout << "first_name:";
    cin >> p3[i].firstname;
    cout << "last_name:";
    cin >> p3[i].lastname;
    cout << "age:";
    cin >> p3[i].age;
    cout << "game name:";
    cin >> p3[i].gamename;
}

for (int i = 0; i < 2; i++)
{
    cout << "first_name:" << p3[i].firstname << endl;
    cout << "last_name:" << p3[i].lastname << endl;
    cout << "age:" << p3[i].age << endl;
    cout << "game name:" << p3[i].gamename << endl;
}

for (int i = 0; i < 2; i++)
{
    player *p4 = &p3[i];
    cout << "first_name:" << p4->firstname << endl;
    cout << "last_name:" << p4->lastname << endl;
    cout << "age:" << p4->age << endl;
    cout << "game name:" << p4->gamename << endl;
}

return 0;

```

}

```
main.cpp
50  cout << "game name:";
51  cin >> p3[i].game_name;
52  }
53
54  for (int i = 0; i < 2; i++)
55  {
56      cout << "first_name:" << p3[i].first_name << endl;
57      cout << "last_name:" << p3[i].last_name << endl;
58      cout << "age:" << p3[i].age << endl;
59      cout << "game name:" << p3[i].game_name << endl;
60  }
61
62  for (int i = 0; i < 2; i++)
63  {
```

input

```
first_name:Jeevan
last_name:Rajpurohit
age:22
game_name:ludo
first_name:Jeevan
last_name:Rajpurohit
age:22
game_name:ludo
first_name:Rakesh
last_name:rajpurohit
age:25
game_name:sudoko
first_name:Rakesh
last_name:rajpurohit
age:25
game_name:sudoko
first_name:bhavesh
last_name:
```

7).

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

```
using namespace std;
```

```
typedef struct player players;
```

```
struct player
```

```
{
```

```
    string first_name, last_name, game_name;
```

```
    int age;
```

```
};
```

```
bool sortbycomp(players &p1, players &p2)
```

```
{
```

```
    return p1.age < p2.age;
```

```
}
```

```
void sortbyage(players *p, int size)
```

```
{
```

```
    sort(p, p + size, sortbycomp);
```

```
}
```

```

int main()
{

    struct player p3[3];
    for (int i = 0; i < 3; i++)
    {
        cout << "first_name:";
        cin >> p3[i].firstname;
        cout << "last_name:";
        cin >> p3[i].lastname;
        cout << "age:";
        cin >> p3[i].age;
        cout << "game name:";
        cin >> p3[i].gamename;
    }

    for (int i = 0; i < 3; i++)
    {
        cout << "first_name:" << p3[i].firstname << endl;
        cout << "last_name:" << p3[i].lastname << endl;
        cout << "age:" << p3[i].age << endl;
        cout << "game name:" << p3[i].gamename << endl;
    }

    // sort(p3,p3+3,sortbyage);
    sortbyage(p3, 3);
    for (int i = 0; i < 3; i++)
    {
        cout << "first_name:" << p3[i].firstname << endl;
        cout << "last_name:" << p3[i].lastname << endl;
        cout << "age:" << p3[i].age << endl;
    }
}

```

```

cout << "game name:" << p3[i].gamenname << endl;

}

return 0;

}

```

The screenshot shows a web browser window with the URL `onlinegdb.com/online_c++_compiler`. The browser has several tabs open, including 'YouTube', 'Gaza Hospital Attack | Huge Pro...', and two instances of 'Online C++ Compiler - online e...'. The compiler interface includes a toolbar with buttons for 'Run', 'Debug', 'Stop', 'Share', 'Save', and 'Beautify'. The language is set to 'C++'. The code editor shows a file named `main.cpp` with the following C++ code:

```

1 #include <iostream>
2 using namespace std;
3 typedef struct player players;
4 struct player
5 {
6     string firstname, lastname, gamename;
7     int age;
8 };
9 bool sortBycomp(players &p1, players &p2)
10 {
11     return p1.age < p2.age;
12 }

```

Below the code editor is an 'input' section with a text area containing the following input data:

```

game name:kabbadi
first_name:bhavesh
last_name:rajpurohit
age:16
game name:chess
first_name:bhavesh
last_name:rajpurohit
age:16
game name:chess
first_name:Jeevan
last_name:RAjpurohit
age:22
game name:cricket
first_name:rakesh
last_name:rajpurohit
age:26
game name:kabbadi

```

At the bottom of the console, it says: `...Program finished with exit code 0 Press ENTER to exit console.`

8).

```

#include <bits/stdc++.h>

using namespace std;

typedef struct player players;

struct player
{
    string firstname, lastname, gamename;
    int age;
};

void findplayer(players *p3)

{
    string temp;

    cout << "enter first name u wanna find:";

```

```

cin >> temp;

for (int i = 0; i < 3; i++)
{
    if (p3[i].firstname == temp)
    {

        cout << "first_name:" << p3[i].firstname << endl;

        cout << "last_name:" << p3[i].lastname << endl;

        cout << "age:" << p3[i].age << endl;

        cout << "game name:" << p3[i].gamename << endl;

    }
}

int main()
{

    struct player p3[3];

    for (int i = 0; i < 3; i++)
    {

        cout << "first_name:";

        cin >> p3[i].firstname;

        cout << "last_name:";

        cin >> p3[i].lastname;

        cout << "age:";

        cin >> p3[i].age;

        cout << "game name:";

        cin >> p3[i].gamename;

    }

    for (int i = 0; i < 3; i++)
    {

```

```

        cout << "first_name:" << p3[i].firstname << endl;

        cout << "last_name:" << p3[i].lastname << endl;

        cout << "age:" << p3[i].age << endl;

        cout << "game name:" << p3[i].gamename << endl;
    }

    // sort(p3,p3+3,sortbyage);

    findplayer(p3);

    return 0;
}

```

```

main.cpp
44 {
45     cout << "first_name:" << p3[i].firstname << endl;
46     cout << "last_name:" << p3[i].lastname << endl;
47     cout << "age:" << p3[i].age << endl;
48     cout << "game name:" << p3[i].gamename << endl;
49 }
50
51 // sort(p3,p3+3,sortbyage);
52 findplayer(p3);
53 return 0;
54 }

```

input

```

first_name:Jeevan
last_name:RAjpurohit
age:22
game name:ludo
first_name:Rakesh
last_name:RAjpurohit
age:25
game name:chess
first_name:bhavesh
last_name:rajpurohit
age:16
game name:cricket
enter first name u wanna find:Jeevan
first_name:Jeevan
last_name:RAjpurohit
age:22
game name:ludo

...Program finished with exit code 0
Press ENTER to exit console.

```

9).

```

#include <iostream>

using namespace std;

struct Player
{
    string firstName;

    string lastName;

    int age;

```

```

string gameName;

};

bool FindRecord(const Player *players, const Player &playerToFind, int size)
{
    for (int i = 0; i < size; i++)
    {
        if (players[i].firstName == playerToFind.firstName &&
            players[i].lastName == playerToFind.lastName &&
            players[i].age == playerToFind.age &&
            players[i].gameName == playerToFind.gameName)
        {
            return true;

        }
    }
    return false;
}

int main()
{
    Player playersArray[4] = {
        {"Alice", "Smith", 25, "Chess"},
        {"Bob", "Johnson", 32, "Football"},
        {"Charlie", "Brown", 20, "Tennis"},
        {"David", "Lee", 28, "Basketball"}};

    Player playerToFind = {"Alice", "Smith", 25, "Chess"};

    if (FindRecord(playersArray, playerToFind, 4))
    {
        cout << "Player found in the list." << endl;
    }
}

```



```

else

{

    cout << "Player not found in the list." << endl;

}

return 0;

}

```

The screenshot shows a web browser window with the URL `onlinegdb.com/online_c++_compiler`. The interface includes a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The main area displays a C++ program in `main.cpp` with the following code:

```

1 #include <iostream>
2 using namespace std;
3 struct Player
4 {
5     string firstName;
6     string lastName;
7     int age;
8     string gameName;
9 };
10 bool FindRecord(const Player *players, const Player &playerToFind, int size)
11 {
12     for (int i = 0; i < size; i++)
13     {
14         if (players[i].firstName == playerToFind.firstName &&
15             players[i].lastName == playerToFind.lastName &&
16             players[i].age == playerToFind.age &&
17             players[i].gameName == playerToFind.gameName)
18         {
19             return true;
20         }
21     }
22 }

```

Below the code editor, the output window shows the result of the program execution:

```

input
Player found in the list.

...Program finished with exit code 0
Press ENTER to exit console.

```

The Windows taskbar at the bottom shows the system clock as 7:23 PM on 18-Oct-23, with a temperature of 31°C and a weather icon for smoke.

10).

```
#include <iostream>
```

```
struct Fraction
```

```
{
```

```
    int p;
```

```
    int q;
```

```
void simplify()
```

```
{
```

```
    int gcd = getGCD(p, q);
```

```
    p /= gcd;
```

```
    q /= gcd;  
}
```

```
Fraction add(Fraction other)  
{  
    Fraction result;  
    result.p = p * other.q + other.p * q;  
    result.q = q * other.q;  
    result.simplify();  
    return result;  
}
```

```
Fraction subtract(Fraction other)  
{  
    Fraction result;  
    result.p = p * other.q - other.p * q;  
    result.q = q * other.q;  
    result.simplify();  
    return result;  
}
```

```
Fraction multiply(Fraction other)  
{  
    Fraction result;  
    result.p = p * other.p;  
    result.q = q * other.q;  
    result.simplify();  
    return result;  
}
```

private:

```
int getGCD(int a, int b)
{
    while (b)
    {
        int temp = b;
        b = a % b;
        a = temp;
    }
    return a;
}

};

int main()
{
    Fraction f1 = {5, 6};
    Fraction f2 = {4, 9};

    Fraction addition = f1.add(f2);
    Fraction subtraction = f1.subtract(f2);
    Fraction multiplication = f1.multiply(f2);

    std::cout << "Addition: " << addition.p << "/" << addition.q <<
std::endl;

    std::cout << "Subtraction: " << subtraction.p << "/" << subtraction.q <<
std::endl;

    std::cout << "Multiplication: " << multiplication.p << "/" <<
multiplication.q << std::endl;

    return 0;
}
```

```
44 int gcd(int a, int b)
45 {
46     while (b)
47     {
48         int temp = b;
49         b = a % b;
50         a = temp;
51     }
52     return a;
53 }
54 };
55 int main()
56 {
57     Fraction f1 = {5, 6};
58     Fraction f2 = {4, 9};
59
60     Fraction addition = f1.add(f2);
61     Fraction subtraction = f1.subtract(f2);
62     Fraction multiplication = f1.multiply(f2);
63
64     std::cout << "Addition: " << addition.p << "/" << addition.q <<
    "\n";
    std::cout << "Subtraction: " << subtraction.p << "/" << subtraction.q <<
    "\n";
    std::cout << "Multiplication: " << multiplication.p << "/" << multiplication.q <<
    "\n";
65 }
```

Input

```
Addition: 23/18
Subtraction: 7/18
Multiplication: 10/27

...Program finished with exit code 0
Press ENTER to exit console.
```

11).

```
#include <iostream>
```

```
struct Complex
```

```
{
```

```
double a;
```

```
double b;
```

```
Complex add(Complex other)
```

```
{
```

```
Complex result;
```

```
result.a = a + other.a;
```

```
result.b = b + other.b;
```

```
return result;
```

```
}
```

```
Complex subtract(Complex other)
```

```
{
```

```

    Complex result;

    result.a = a - other.a;

    result.b = b - other.b;

    return result;
}

```

```

Complex multiply(Complex other)
{
    Complex result;

    result.a = (a * other.a) - (b * other.b);

    result.b = (a * other.b) + (b * other.a);

    return result;
}
};

```

```

int main()
{
    Complex c1 = {3.0, 2.0};

    Complex c2 = {4.0, 5.0};


    Complex addition = c1.add(c2);

    Complex subtraction = c1.subtract(c2);

    Complex multiplication = c1.multiply(c2);


    std::cout << "Addition: " << addition.a << " + " << addition.b << "i" <<
    std::endl;

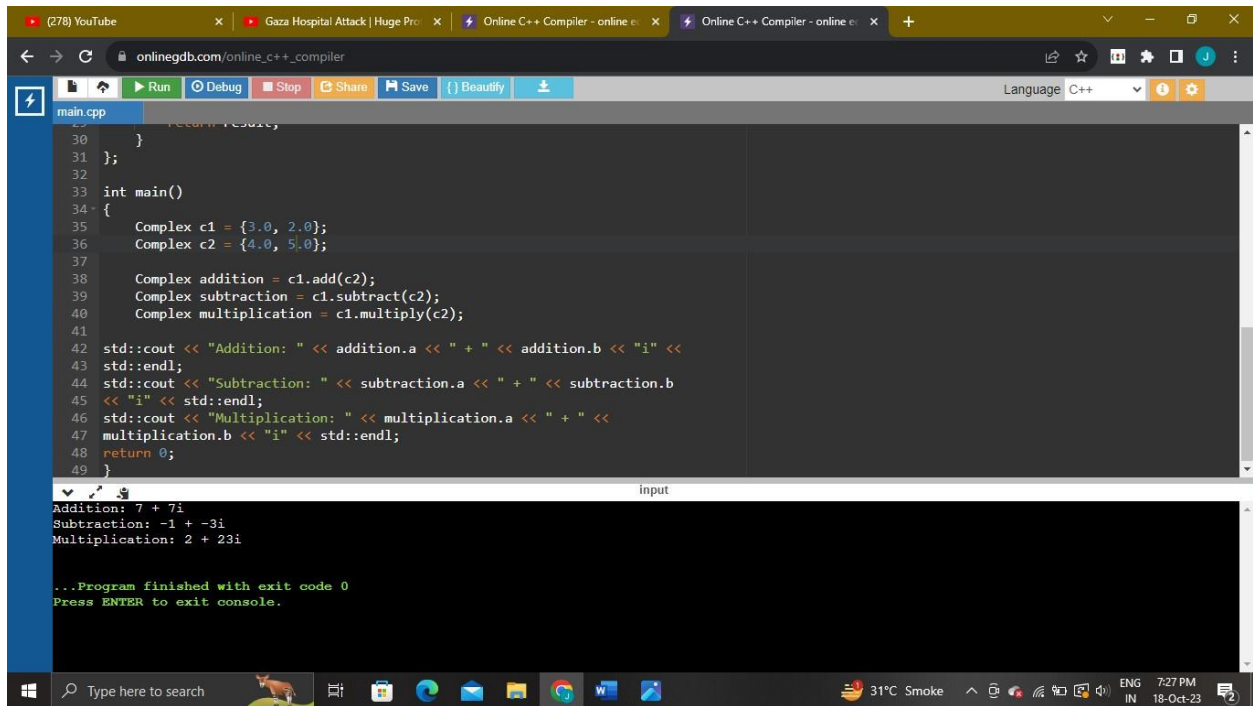
    std::cout << "Subtraction: " << subtraction.a << " + " << subtraction.b
    << "i" << std::endl;

    std::cout << "Multiplication: " << multiplication.a << " + " <<
    multiplication.b << "i" << std::endl;

    return 0;
}

```

}



The screenshot displays a web browser window with the URL `onlinegdb.com/online_c++_compiler`. The browser's address bar and tabs are visible at the top. Below the browser window is the online compiler interface, which includes a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The main area is divided into two panes: a code editor on the left and an output console on the right. The code editor contains a C++ program named `main.cpp` that defines a `Complex` structure and implements `add`, `subtract`, and `multiply` methods. The `main` function creates two complex numbers, `c1` and `c2`, and performs operations on them. The output console shows the results of these operations: Addition: 7 + 7i, Subtraction: -1 + -3i, and Multiplication: 2 + 23i. The program finished with exit code 0.

```
main.cpp
1 // ...
2 }
3 };
4
5 int main()
6 {
7     Complex c1 = {3.0, 2.0};
8     Complex c2 = {4.0, 5.0};
9
10    Complex addition = c1.add(c2);
11    Complex subtraction = c1.subtract(c2);
12    Complex multiplication = c1.multiply(c2);
13
14    std::cout << "Addition: " << addition.a << " + " << addition.b << "i" <<
15    std::endl;
16    std::cout << "Subtraction: " << subtraction.a << " + " << subtraction.b
17    << "i" << std::endl;
18    std::cout << "Multiplication: " << multiplication.a << " + " <<
19    multiplication.b << "i" << std::endl;
20    return 0;
21 }
```

input

```
Addition: 7 + 7i
Subtraction: -1 + -3i
Multiplication: 2 + 23i

...Program finished with exit code 0
Press ENTER to exit console.
```