

**C++**

**Assignment – 5**

**Name – Kishan R Vaghamashi**

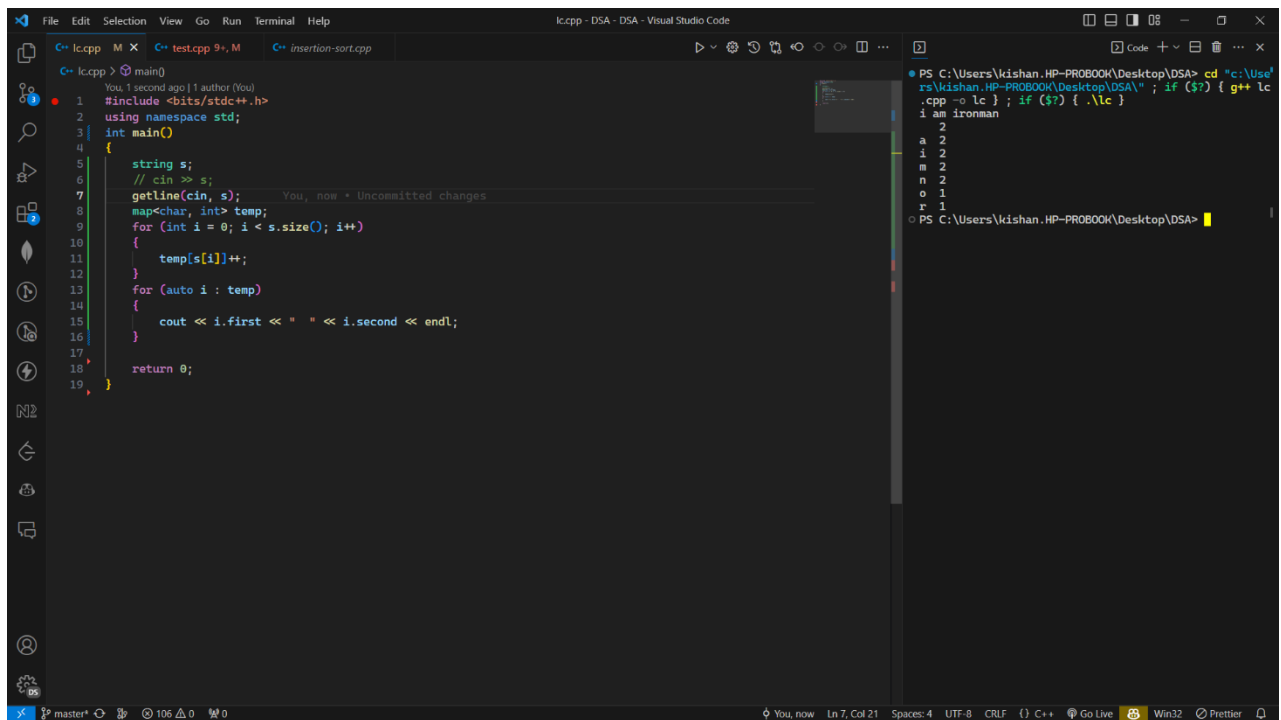
**Student ID – 202312014**

1)

```
#include <bits/stdc++.h>
using namespace std;
int main()
{
    string s;
    cin >> s;
    map<char, int> temp;
    for (int i = 0; i < s.size(); i++)
    {
        temp[s[i]]++;
    }
    for (auto i : temp)
    {
        cout << i.first << " " << i.second << endl;
    }

    return 0;
}
```

Output:

The screenshot shows the Visual Studio Code editor with a C++ file named 'lc.cpp'. The code is the same as shown in the previous block. The output window on the right shows the execution results. The input string is 'a2i2m2n2o1r1', and the output is a list of characters and their frequencies: 'a 2', 'i 2', 'm 2', 'n 2', 'o 1', 'r 1'. The status bar at the bottom indicates the file is 'master\*' and the editor is in 'C++' mode.

```
File Edit Selection View Go Run Terminal Help
lc.cpp - DSA - DSA - Visual Studio Code

C++ lc.cpp M X C++ test.cpp 9+, M C++ insertion-sort.cpp
You, 1 second ago | 1 author (You)
1 #include <bits/stdc++.h>
2 using namespace std;
3 int main()
4 {
5     string s;
6     // cin >> s;
7     getline(cin, s);
8     map<char, int> temp;
9     for (int i = 0; i < s.size(); i++)
10    {
11        temp[s[i]]++;
12    }
13    for (auto i : temp)
14    {
15        cout << i.first << " " << i.second << endl;
16    }
17    return 0;
18 }
19 }

You, now • Uncommitted changes

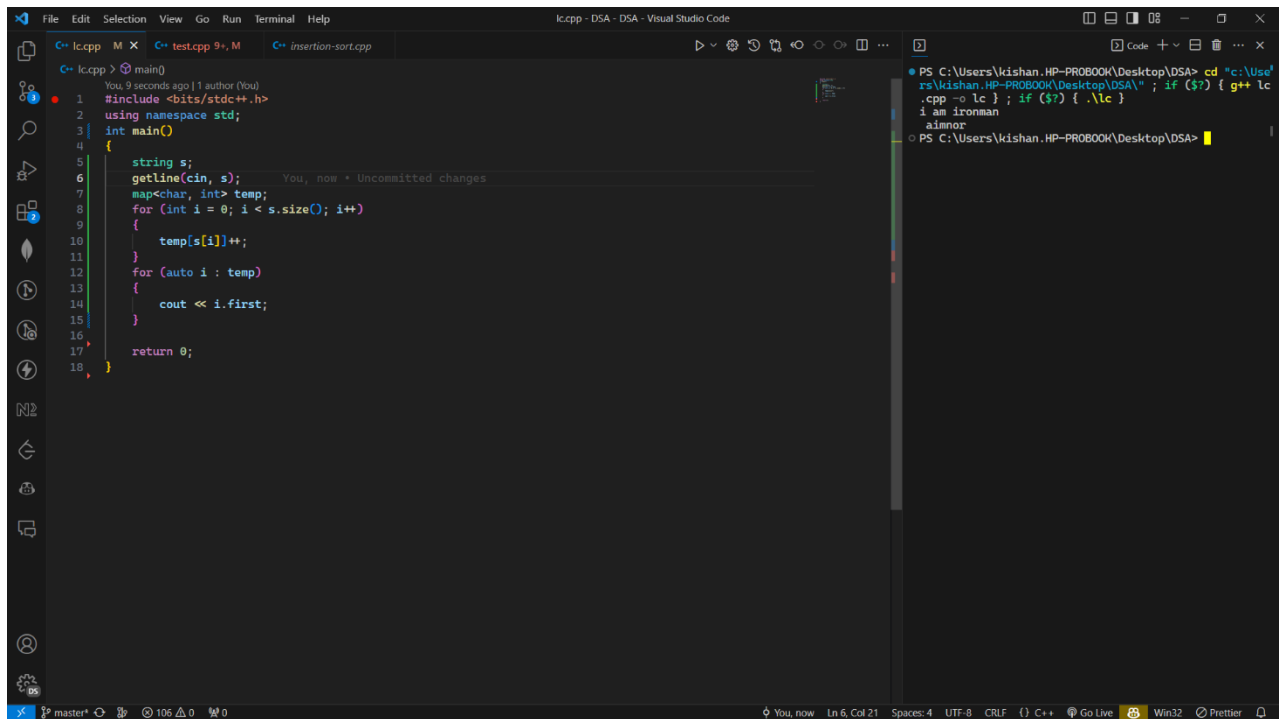
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\kishan.HP-PROBOOK\Desktop\DSA" ; if ($?) { g++ lc.cpp -o lc } ; if ($?) { .\lc }
i am ironman
a 2
i 2
m 2
n 2
o 1
r 1
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>
```

2)

```
#include <bits/stdc++.h>
using namespace std;
int main()
{
    string s;
    getline(cin, s);
    map<char, int> temp;
    for (int i = 0; i < s.size(); i++)
    {
        temp[s[i]]++;
    }
    for (auto i : temp)
    {
        cout << i.first;
    }

    return 0;
}
```

Output:

The screenshot shows the Visual Studio Code editor with a C++ file named 'lc.cpp'. The code is the same as shown in the previous block. The output window on the right shows the command prompt output: 'PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\kishan.HP-PROBOOK\Desktop\DSA" & gcc lc.cpp -o lc ; if (\$?) { .\lc }' followed by the output 'i am ironman' and 'aimor'. The status bar at the bottom indicates the file is on the 'master' branch, has 106 lines, and is using UTF-8 encoding with CRLF line endings. The editor is running C++ on a Windows 32-bit system using the Prettier formatter.

3)

```
#include <bits/stdc++.h>
using namespace std;
int main()
{
    string s1, s2, s3, s4, s5;
    cin >> s1;
    cin >> s2;
    cin >> s3;
    cin >> s4;
    cin >> s5;
    int a[5], max = a[0], loc = 0, i;
    a[0] = s1.size();
    a[1] = s2.size();
    a[2] = s3.size();
    a[3] = s4.size();
    a[4] = s5.size();
    for (i = 0; i < 5; i++)
    {
        if (max < a[i])
        {
            max = a[i];
            loc = i;
        }
    }
    switch (loc)
    {
        case 0:
            cout << a[loc] << " " << s1;
            break;
        case 1:
            cout << a[loc] << " " << s2;
            break;
        case 2:
            cout << a[loc] << " " << s3;
            break;
        case 3:
            cout << a[loc] << " " << s4;
            break;
        case 4:
            cout << a[loc] << " " << s5;
            break;
    }
}
```

```

    return 0;
}

```

Output:

```

1  #include <bits/stdc++.h>
2  using namespace std;
3  int main()
4  {
5      string s1, s2, s3, s4, s5;
6      cin >> s1;
7      cin >> s2;
8      cin >> s3;
9      cin >> s4;
10     cin >> s5;
11     int a[5], max = a[0], loc = 0, i;
12     a[0] = s1.size();
13     a[1] = s2.size();
14     a[2] = s3.size();
15     a[3] = s4.size();
16     a[4] = s5.size();
17     for (i = 0; i < 5; i++)
18     {
19         if (max < a[i])
20         {
21             max = a[i];
22             loc = i;
23         }
24     }
25     switch (loc)
26     {
27     case 0:
28         cout << a[loc] << " " << s1;
29         break;
30     case 1:
31         cout << a[loc] << " " << s2;
32         break;
33     case 2:
34         cout << a[loc] << " " << s3;
35         break;
36     case 3:
37         cout << a[loc] << " " << s4;
38         break;
39     case 4:

```

4)

```

#include <bits/stdc++.h>
using namespace std;
int main()
{
    int key[3][3][3], passcode[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 passcode:";
}

```

```

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)
            {
                passcode[i] = key[i][j][k];
                break;
            }
            count++;
        }
    }
    cout << "secret key:";
    cout << passcode[0];
    cout << passcode[1];
    cout << passcode[2];
    return 0;
}

```

Output:

The screenshot shows a Visual Studio Code editor with a C++ file named `lc.cpp` open. The code in the editor is a 3D array search program. The terminal window on the right shows the program's execution. It prompts for a temperature value, which is entered as 642220419730526578. The program then outputs the secret key for each of the three indices (0, 1, and 2) based on the input temperature.

```

C++ lc.cpp M X C++ test.cpp 9+, M C++ insertion-sort.cpp
You, 1 minute ago | 1 author (You)
1 #include <bits/stdc++.h>
2 using namespace std;
3 int main()
4 {
5     int key[3][3][3], passcode[3];
6     for (int i = 0; i < 3; i++)
7     {
8         for (int j = 0; j < 3; j++)
9         {
10            for (int k = 0; k < 3; k++)
11            {
12                cout << "key = " << i << " " << j << " " << k << " = ";
13                cin >> key[i][j][k];
14            }
15        }
16    }
17    cout << "enter passcode:";
18    for (int i = 0; i < 3; i++)
19    {
20        int temp, count = 0;
21        cin >> temp;
22        for (int j = 0; j < 3; j++)
23        {
24            for (int k = 0; k < 3; k++)
25            {
26                if (count == temp)
27                {
28                    passcode[i] = key[i][j][k];
29                    break;
30                }
31                count++;
32            }
33        }
34    }
35
36    cout << "secret key:";
37    cout << passcode[0];
38    cout << passcode[1];
39    cout << passcode[2];
40
41    return 0;
42 }

```

```

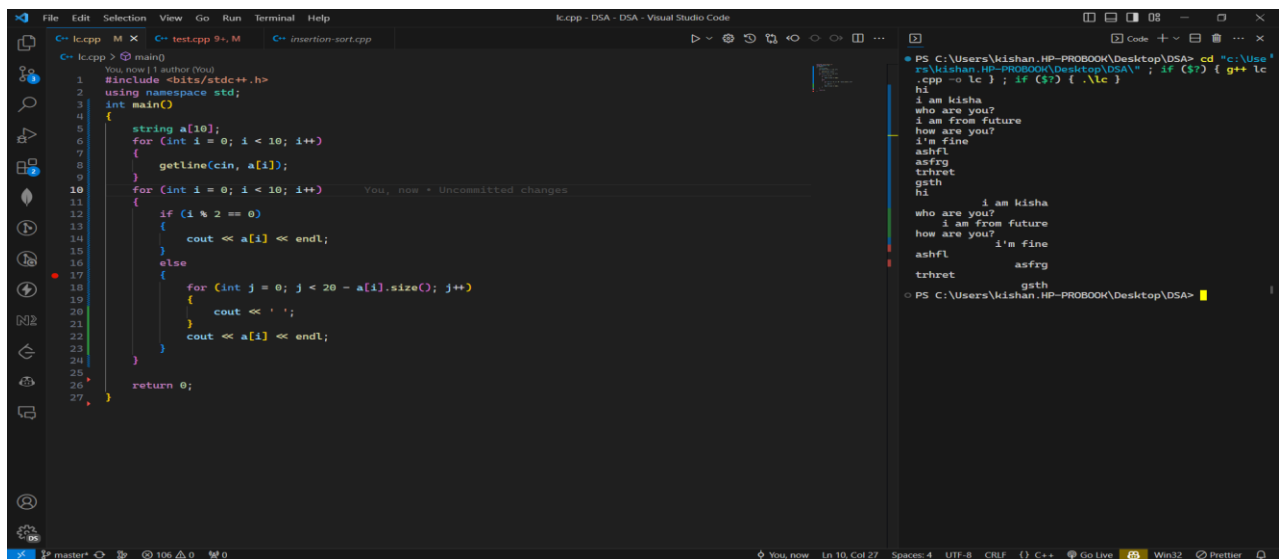
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "c:\Users\kishan.HP-PROBOOK\Desktop\DSA\"; if ($?) { g++ lc.cpp -o lc }; if ($?) { .\lc }
key 0 00=8768468
key 0 01=96745
key 0 02=36891
key 0 10=36717
key 0 11=368197
key 0 12=541997
key 0 20=618997
key 0 21=3297
key 0 22=6972979
key 1 00=687187118
key 1 01=652998
key 1 02=664864684
key 1 10=967497
key 1 11=6876741
key 1 12=687187
key 1 20=6174
key 1 21=56874189
key 1 22=8716714
key 2 00=6871697
key 2 01=6871987
key 2 02=4687198
key 2 10=87187
key 2 11=687187
key 2 12=687187
key 2 20=48718
key 2 21=68719784
key 2 22=enter passcode:secret key:642220419730526578
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```

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;
}
```

Output:



The screenshot shows the Visual Studio Code editor with the C++ code from the previous block. The output window on the right displays the program's execution results. The input provided was: "You, now I am kisha", "I am from future", "how are you?", "I'm fine", "ashfl", "asfry", "trhret", "gsth", "hi". The output shows the first line as is, and subsequent lines are padded with spaces to align the text.

```
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\kishan.HP-PROBOOK\Desktop\DSA\" ; if ($?) { g++ lc.cpp -o lc } ; if ($?) { .\lc }
```

```
i am kisha
who are you?
i am from future
how are you?
i'm fine
ashfl
asfry
trhret
gsth
hi
      i am kisha
      who are you?
      i am from future
      how are you?
      i'm fine
      ashfl
      asfry
      trhret
      gsth
```

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

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].gamenname;
    }

    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].gamenname << 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->gamenname << endl;
    }

    return 0;
}

```

Output:

```

C++ test.cpp 9, M  Insertion-sort.cpp
C++ lc.cpp > main()
You, 3 seconds ago | 1 author (You)
#include <bits/stdc++.h>
using namespace std;
You, 3 seconds ago | 1 author (You)
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.gamenname;

    cout << "first_name:" << p1.firstname << endl;
    cout << "last_name:" << p1.lastname << endl;
    cout << "age:" << p1.age << endl;
    cout << "game name:" << p1.gamenname << 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->gamenname;

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

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "c:\Users\kishan.HP-PROBOOK\Desktop\DSA\"; if ($?) { g++ lc.cpp -o lc }; if ($?) { .\lc }
first_name:kishan
last_name:vaghamashi
age:21
game name:cricket
first_name:kishan
last_name:vaghamashi
age:21
game name:cricket
first_name:jay
last_name:vaghamashi
age:24
game name:kabbadi
first_name:jay
last_name:vaghamashi
age:24
game name:kabbadi
first_name:parth
last_name:ahir
age:25
game name:football
first_name:priyesh
last_name:baldaniya
age:26
game name:chess
first_name:parth
last_name:ahir
age:25
game name:football
first_name:priyesh
last_name:baldaniya
age:26
game name:chess
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```

7)

```
#include <bits/stdc++.h>
using namespace std;
typedef struct player players;
struct player
{
    string firstname, lastname, gamename;
    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;
}

```

Output:

The screenshot shows the Visual Studio Code editor with a C++ file named `test.cpp`. The code defines a `player` struct and a `main` function that sorts an array of players by age and then prints their details. The output window on the right shows the execution results, displaying the details of three players: kishan (age 21), jay (age 24), and parth (age 25).

```

C++: lccpp M X C++ test.cpp 9+, M C++ insertion-sort.cpp
C++: lccpp > main()
14 {
15     sort(p, p + size, sortbycomp);
16 }
17 int main()
18 {
19     struct player p3[3];
20     for (int i = 0; i < 3; i++)
21     {
22         cout << "first_name:";
23         cin >> p3[i].firstname;
24         cout << "last_name:";
25         cin >> p3[i].lastname;
26         cout << "age:";
27         cin >> p3[i].age;
28         cout << "game name:";
29         cin >> p3[i].gamenname;
30     }
31 }
32
33 for (int i = 0; i < 3; i++)
34 {
35     cout << "first_name:" << p3[i].firstname << endl;
36     cout << "last_name:" << p3[i].lastname << endl;
37     cout << "age:" << p3[i].age << endl;
38     cout << "game name:" << p3[i].gamenname << endl;
39 }
40
41 // sort(p3, p3+3, sortbyage);
42 sortbyage(p3, 3);
43 for (int i = 0; i < 3; i++)
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].gamenname << endl;
49 }
50 return 0;
51 }

```

```

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "c:\Use
rs\kishan.HP-PROBOOK\Desktop\DSA\"; if ($?) { g++ lc
.cpp -o lc }; if ($?) { .\lc }
first_name:kishan
last_name:vaghamashi
age:21
game name:ludo
first_name:jay
last_name:vaghamashi
age:24
game name:football
first_name:parth
last_name:ahir
age:25
game name:cricket
first_name:kishan
last_name:vaghamashi
age:21
game name:ludo
first_name:jay
last_name:vaghamashi
age:24
game name:football
first_name:parth
last_name:ahir
age:25
game name:cricket
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```

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].gamenname << 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].gamenname;
    }

    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;
    }

    // sort(p3,p3+3,sortbyage);
    findplayer(p3);
    return 0;
}

```

Output:

```

14     for (int i = 0; i < 3; i++)
15     {
16         if (p3[i].firstname == temp)
17         {
18             cout << "first_name:" << p3[i].firstname << endl;
19             cout << "last_name:" << p3[i].lastname << endl;
20             cout << "age:" << p3[i].age << endl;
21             cout << "game name:" << p3[i].gamenname << endl;
22         }
23     }
24 }
25
26 int main()
27 {
28     struct player p3[3];
29     for (int i = 0; i < 3; i++)
30     {
31         cout << "first_name:";
32         cin >> p3[i].firstname;
33         cout << "last_name:";
34         cin >> p3[i].lastname;
35         cout << "age:";
36         cin >> p3[i].age;
37         cout << "game name:";
38         cin >> p3[i].gamenname;
39     }
40
41     for (int i = 0; i < 3; i++)
42     {
43         cout << "first_name:" << p3[i].firstname << endl;
44         cout << "last_name:" << p3[i].lastname << endl;
45         cout << "age:" << p3[i].age << endl;
46         cout << "game name:" << p3[i].gamenname << endl;
47     }
48
49     // sort(p3,p3+3,sortbyage);
50     findplayer(p3);
51     return 0;
52 }

```

```

PS C:\Users\Kishan.HP-PROBOOK\Desktop\DSA> cd "c:\Users\Kishan.HP-PROBOOK\Desktop\DSA\"; if ($?) { g++ lc.cpp -o lc }; if ($?) { .\lc }
first_name:kishab
last_name:vaghamashi
age:21
game name:ludo
first_name:jay
last_name:vaghamashi
age:24
game name:chess
first_name:parth
last_name:ahir
age:25
game name:cricket
first_name:kishab
last_name:vaghamashi
age:21
game name:ludo
first_name:jay
last_name:vaghamashi
age:24
game name:chess
first_name:parth
last_name:ahir
age:25
game name:cricket
enter first name u wanna find:parth
first_name:parth
last_name:ahir
age:25
game name:cricket
PS C:\Users\Kishan.HP-PROBOOK\Desktop\DSA>

```

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;
}

```

Output:

The screenshot shows the Visual Studio Code editor with the C++ code from the previous block. The output window on the right displays the following text:

```

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\kishan.HP-PROBOOK\Desktop\DSA\"; if ($?) { g++ lc.cpp -o lc }; if ($?) { .\lc }
Player found in the list.
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```

The status bar at the bottom indicates the file is 'master', the cursor is at line 47, column 2, and the encoding is UTF-8.

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 = {3, 4};
    Fraction f2 = {1, 2};

    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;
}

```

Output:

The screenshot shows the Visual Studio Code editor with the C++ code from the previous block. The output window on the right displays the results of the program's execution:

```

PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\kishan.HP-PROBOOK\Desktop\DSA" & if ($?) { g++ test.cpp -std=c++11 -o test.exe & .\test.exe }
Addition: 5/4
Subtraction: 1/4
Multiplication: 3/8
PS C:\Users\kishan.HP-PROBOOK\Desktop\DSA>

```



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 = {1.0, 2.0};
    Complex c2 = {2.0, 3.0};

    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;
}

```

Output:

The screenshot shows the Visual Studio Code editor with a C++ file named `lc.cpp` open. The code defines a `Complex` struct with `double a;` and `double b;` members, and implements three functions: `add`, `subtract`, and `multiply`. The `main` function creates two complex numbers, `c1 = {1.0, 2.0}` and `c2 = {2.0, 3.0}`, and calls `c1.add(c2)`. The output window on the right shows the execution results:

```

PS C:\Users\Kishan.HP-PROBOOK\Desktop\DSA> cd "C:\Users\Kishan.HP-PROBOOK\Desktop\DSA\"; if ($?) { g++ lc.cpp -o lc }; if ($?) { .\lc }
Addition: 3 + 5i
Subtraction: -1 + -1i
Multiplication: -4 + 7i
PS C:\Users\Kishan.HP-PROBOOK\Desktop\DSA>

```