


DSA BOOTCAMP ASSIGNMENT

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Q1. Write a program to Swap to two numbers.



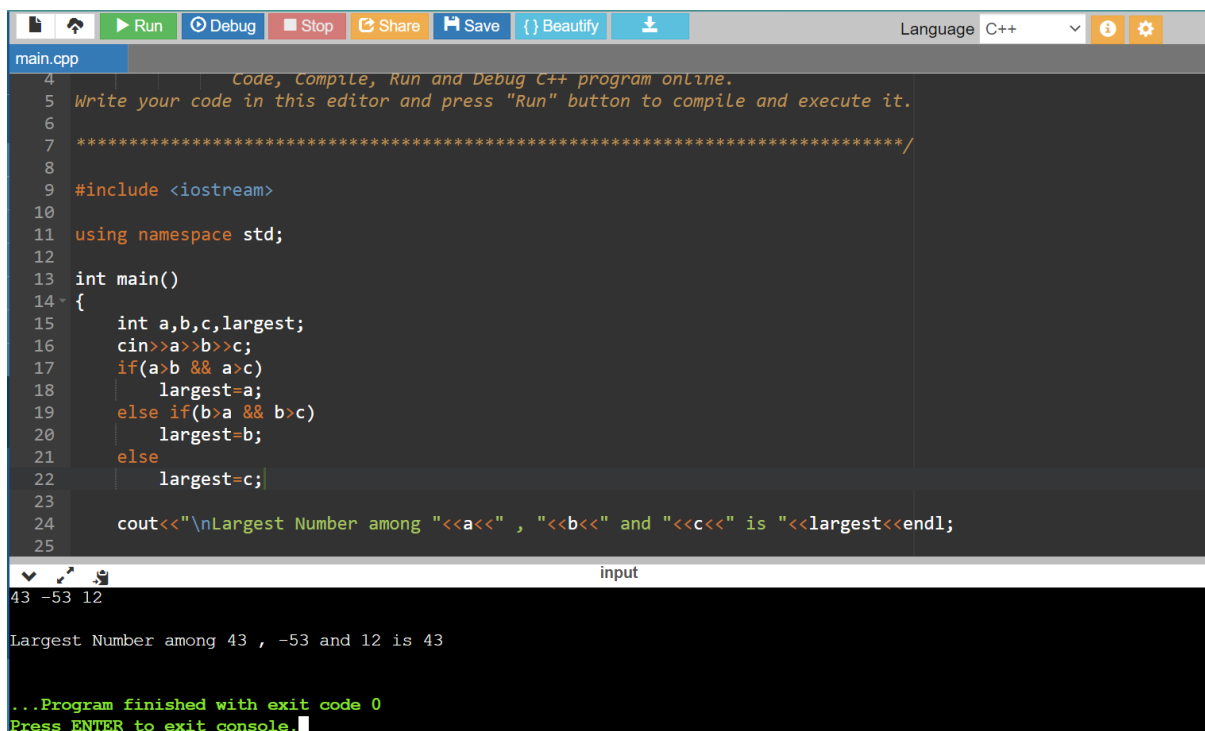
The screenshot shows a C++ IDE with a file named 'main.cpp'. The code is as follows:

```
5 Write your code in this editor and press "Run" button to compile and execute it.
6
7 *****/
8
9 #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int a,b;
16     cin>>a>>b;
17     cout<<"Before Swapping: ";
18     a=a+b;
19     b=a-b;
20     a=a-b;
21     cout<<"\nAfter Swapping: "<<a<<" "<<b;
22
23
24     return 0;
25 }
26
```

The output window shows the following:

```
input
12 54
Before Swapping:
After Swapping: 54 12
...Program finished with exit code 0
Press ENTER to exit console.
```

Q2. Write a program to find the largest number among three numbers entered by the user.



The screenshot shows a C++ IDE with a file named 'main.cpp'. The code is as follows:

```
4 Code, Compile, Run and Debug C++ program online.
5 Write your code in this editor and press "Run" button to compile and execute it.
6
7 *****/
8
9 #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int a,b,c,largest;
16     cin>>a>>b>>c;
17     if(a>b && a>c)
18         largest=a;
19     else if(b>a && b>c)
20         largest=b;
21     else
22         largest=c;
23
24     cout<<"\nLargest Number among "<<a<<" , "<<b<<" and "<<c<<" is "<<largest<<endl;
25
```

The output window shows the following:

```
input
43 -53 12
Largest Number among 43 , -53 and 12 is 43
...Program finished with exit code 0
Press ENTER to exit console.
```

Q3. Write a program to check whether a year entered by a user is Leap year or not.



The screenshot shows a C++ IDE with a file named 'main.cpp'. The code is a program to check if a year is a leap year. It includes the <iostream> header, uses the std namespace, and defines a main function. Inside main, it declares an integer 'year', takes user input, and uses an if statement to check if the year is divisible by 4 but not by 100, or divisible by 400. It then prints the result. The console output shows the input '2000' and the output '2000 is a Leap Year'. The program finished with exit code 0.

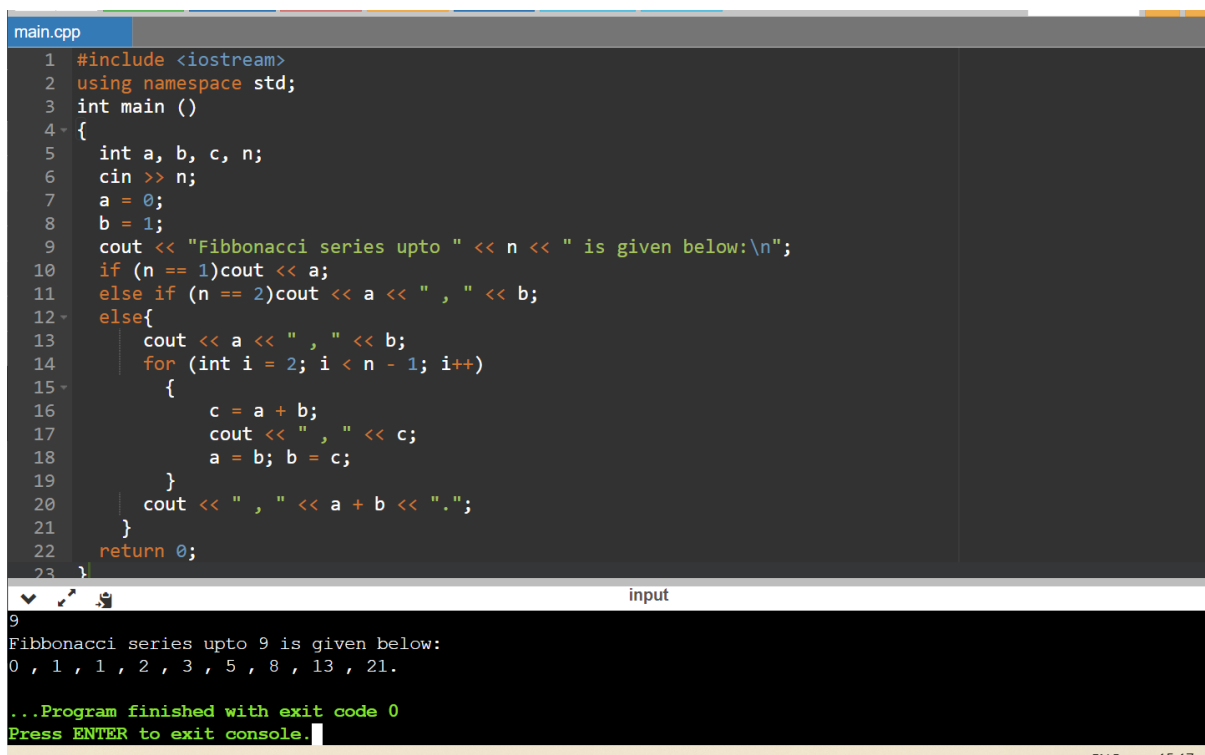
```
4 // Code, Compile, Run and Debug C++ program online.
5 // Write your code in this editor and press "Run" button to compile and execute it.
6 // *****/
7
8
9 #include <iostream>
10
11 using namespace std;
12
13 int main()
14 {
15     int year;
16     cin >> year;
17     if(year%4==0 || (year%100==0 && year%400==0))
18         cout << year << " is a Leap Year";
19     else
20         cout << year << " is NOT a Leap Year";
21
22
23     return 0;
24 }
25
```

input

2000
2000 is a Leap Year

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

Q4. Write a program to display Fibonacci Series upto nth term. (Using loops)



The screenshot shows a C++ IDE with a file named 'main.cpp'. The code is a program to display the Fibonacci series up to the nth term. It includes the <iostream> header, uses the std namespace, and defines a main function. Inside main, it declares integers 'a', 'b', 'c', and 'n'. It takes user input for 'n' and initializes 'a' to 0 and 'b' to 1. It then uses a loop to calculate the series terms and prints them. The console output shows the input '9' and the output 'Fibonacci series upto 9 is given below: 0, 1, 1, 2, 3, 5, 8, 13, 21.'. The program finished with exit code 0.

```
1 #include <iostream>
2 using namespace std;
3 int main ()
4 {
5     int a, b, c, n;
6     cin >> n;
7     a = 0;
8     b = 1;
9     cout << "Fibonacci series upto " << n << " is given below:\n";
10    if (n == 1) cout << a;
11    else if (n == 2) cout << a << " , " << b;
12    else{
13        cout << a << " , " << b;
14        for (int i = 2; i < n - 1; i++)
15        {
16            c = a + b;
17            cout << " , " << c;
18            a = b; b = c;
19        }
20        cout << " , " << a + b << ".";
21    }
22    return 0;
23 }
```

input

9
Fibonacci series upto 9 is given below:
0 , 1 , 1 , 2 , 3 , 5 , 8 , 13 , 21.

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

Q5. Write a program to check whether a number is Prime or Not.



The image shows a C++ IDE with a file named `main.cpp`. The code is a program to check if a number is prime or not. It includes `<iostream>` and uses the `std` namespace. The `main` function takes an integer `n` as input. It initializes a flag `f` to 1. If `n` is greater than 2 and even (`n%2==0`), it sets `f` to 0. Otherwise, it enters a loop from `i=2` to `n/2`. If `n` is divisible by `i` (`n%i==0`), it sets `f` to 0 and breaks the loop. After the loop, it checks the value of `f`. If `f` is 1, it prints "`n` is a Prime Number."; otherwise, it prints "`n` is not a Prime Number.". The program returns 0.

```
1 #include <iostream>
2 using namespace std;
3 int main ()
4 {
5     int n,f;
6     cin >> n;
7     f=1;
8     if(n>2&& n%2==0)
9         f=0;
10    else{
11        for(int i=2;i<n/2;i++)
12            if(n%i==0){
13                f=0;
14                break;
15            }
16    }
17    if (f == 1) cout << n<<" is a Prime Number.";
18    else cout << n << " is not a Prime Number. ";
19    return 0;
20 }
```

The output window shows the program execution. It displays the input "24" and the output "24 is not a Prime Number.". It also shows the message "...Program finished with exit code 0" and "Press ENTER to exit console."

Q6. Print this pattern using loops
For n=5

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

main.cpp

```
1 #include <iostream>
2 using namespace std;
3 int main ()
4 {
5     int n=5;
6     for(int i=0;i<n;i++){
7         for(int k=n-i-1;k>0;k--)
8             cout<<" ";
9         for(int j=0;j<=i;j++)
10            cout<<"* ";
11        cout<<endl;
12    }
13    return 0;
14 }
```

input

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

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

Q7. Write a program that takes n elements from the user and displays the second largest element of an array.

```
main.cpp
1  #include <iostream>
2  using namespace std;
3  int main ()
4  {
5      int ar[5],m1,m2;
6      cout<<"Enter 5 integer elements ";
7      for(int i=0;i<5;i++)
8          cin>>ar[i];
9      m1=ar[0];
10     m2=ar[1];
11     for(int i=2;i<5;i++){
12         if(ar[i]>m1){
13             m2=m1;
14             m1=ar[i];
15         }
16     }
17     cout<<"Second Largest Element is "<<m2;
18     return 0;
19 }
```

input

```
Enter 5 integer elements 234 -3455 23 54 877
Second Largest Element is 234

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

Q8. [Left Rotation](#)

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

using namespace std;

string ltrim(const string &);
string rtrim(const string &);
vector<string> split(const string &);

/*
 * Complete the 'rotateLeft' function below.
 *
 * The function is expected to return an INTEGER_ARRAY.
 * The function accepts following parameters:
 * 1. INTEGER d
 * 2. INTEGER_ARRAY arr
 */

vector<int> rotateLeft(int d, vector<int> arr) {
    int n=arr.size();
    int f,j;
    for(int i=0;i<d;i++){
        f=arr[0];
        for(j=0;j<n-1;j++){
            arr[j]=arr[j+1];
        }
        arr[n-1]=f;
    }
    return arr;
}

int main()
{
    ofstream fout(getenv("OUTPUT_PATH"));

    string first_multiple_input_temp;
    getline(cin, first_multiple_input_temp);

    vector<string> first_multiple_input = split(rtrim(first_multiple_in
put_temp));

    int n = stoi(first_multiple_input[0]);
```

```

int d = stoi(first_multiple_input[1]);

string arr_temp_temp;
getline(cin, arr_temp_temp);

vector<string> arr_temp = split(rtrim(arr_temp_temp));

vector<int> arr(n);

for (int i = 0; i < n; i++) {
    int arr_item = stoi(arr_temp[i]);

    arr[i] = arr_item;
}

vector<int> result = rotateLeft(d, arr);

for (size_t i = 0; i < result.size(); i++) {
    fout << result[i];

    if (i != result.size() - 1) {
        fout << " ";
    }
}

fout << "\n";

fout.close();

return 0;
}

string ltrim(const string &str) {
    string s(str);

    s.erase(
        s.begin(),
        find_if(s.begin(), s.end(), not1(ptr_fun<int, int>(isspace)))
    );

    return s;
}

string rtrim(const string &str) {
    string s(str);

```

```

        s.erase(
            find_if(s.rbegin(), s.rend(), not1(ptr_fun<int, int>(isspace)))
            .base(),
            s.end()
        );

        return s;
    }

vector<string> split(const string &str) {
    vector<string> tokens;

    string::size_type start = 0;
    string::size_type end = 0;

    while ((end = str.find(" ", start)) != string::npos) {
        tokens.push_back(str.substr(start, end - start));

        start = end + 1;
    }

    tokens.push_back(str.substr(start));

    return tokens;
}

```

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Practice > Data Structures > Arrays > Left Rotation
203 more points to get your next star!
Rank: 556971 | Points: 272/475

Left Rotation ★

Your Left Rotation submission got 20.00 points.

You are now 203 points away from the 4th star for your problem solving badge.

[Try the next challenge](#) | [Try a Random Challenge](#)

Q9. [Grading Students](#)

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

using namespace std;
string ltrim(const string &);
string rtrim(const string &);

vector<int> gradingStudents(vector<int> grades) {
    int n=grades.size();
    for(int i=0;i<n;i++){

        if(grades[i]>=38){
            if(grades[i]%5>=3){
                grades[i]+=(5-grades[i]%5);
            }
        }
    }
    return grades;
}

int main()
{
    ofstream fout(getenv("OUTPUT_PATH"));

    string grades_count_temp;
    getline(cin, grades_count_temp);

    int grades_count = stoi(ltrim(rtrim(grades_count_temp)));

    vector<int> grades(grades_count);

    for (int i = 0; i < grades_count; i++) {
        string grades_item_temp;
        getline(cin, grades_item_temp);

        int grades_item = stoi(ltrim(rtrim(grades_item_temp)));

        grades[i] = grades_item;
    }

    vector<int> result = gradingStudents(grades);

    for (size_t i = 0; i < result.size(); i++) {
```

```

        fout << result[i];

        if (i != result.size() - 1) {
            fout << "\n";
        }
    }

    fout << "\n";

    fout.close();

    return 0;
}

string ltrim(const string &str) {
    string s(str);

    s.erase(
        s.begin(),
        find_if(s.begin(), s.end(), not1(ptr_fun<int, int>(isspace)))
    );

    return s;
}

string rtrim(const string &str) {
    string s(str);

    s.erase(
        find_if(s.rbegin(), s.rend(), not1(ptr_fun<int, int>(isspace)))
        .base(),
        s.end()
    );

    return s;
}

```

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Practice > Algorithms > Implementation > Grading Students
223 more points to get your next star!
Rank: 597747 | Points: 252/475

Grading Students ★

You have successfully solved Grading Students
You are now 223 points away from the 4th star for your problem solving badge.
[Try the next challenge](#) | [Try a Random Challenge](#)

Q10. [CamelCase](#)

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

using namespace std;

int camelcase(string s) {
    int n=1,i=0;
    while (s[i]!='\0') {
        if(s[i]>='A'&&s[i]<='Z')
            n++;
        i++;
    }
    return n;
}

int main()
{
    ofstream fout(getenv("OUTPUT_PATH"));

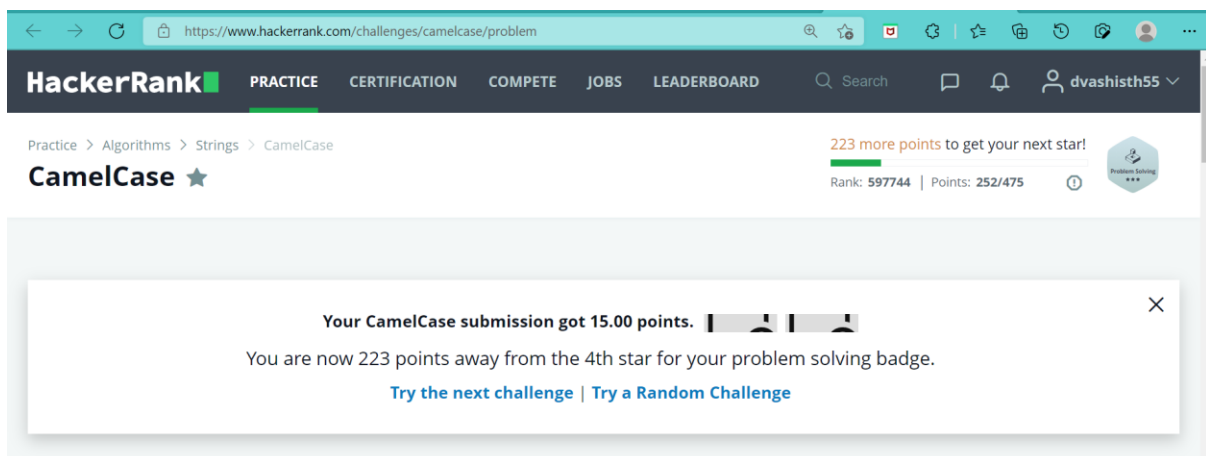
    string s;
    getline(cin, s);

    int result = camelcase(s);

    fout << result << "\n";

    fout.close();

    return 0;
}
```



The End