School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

Fundamental of Programing

Assignment # 01

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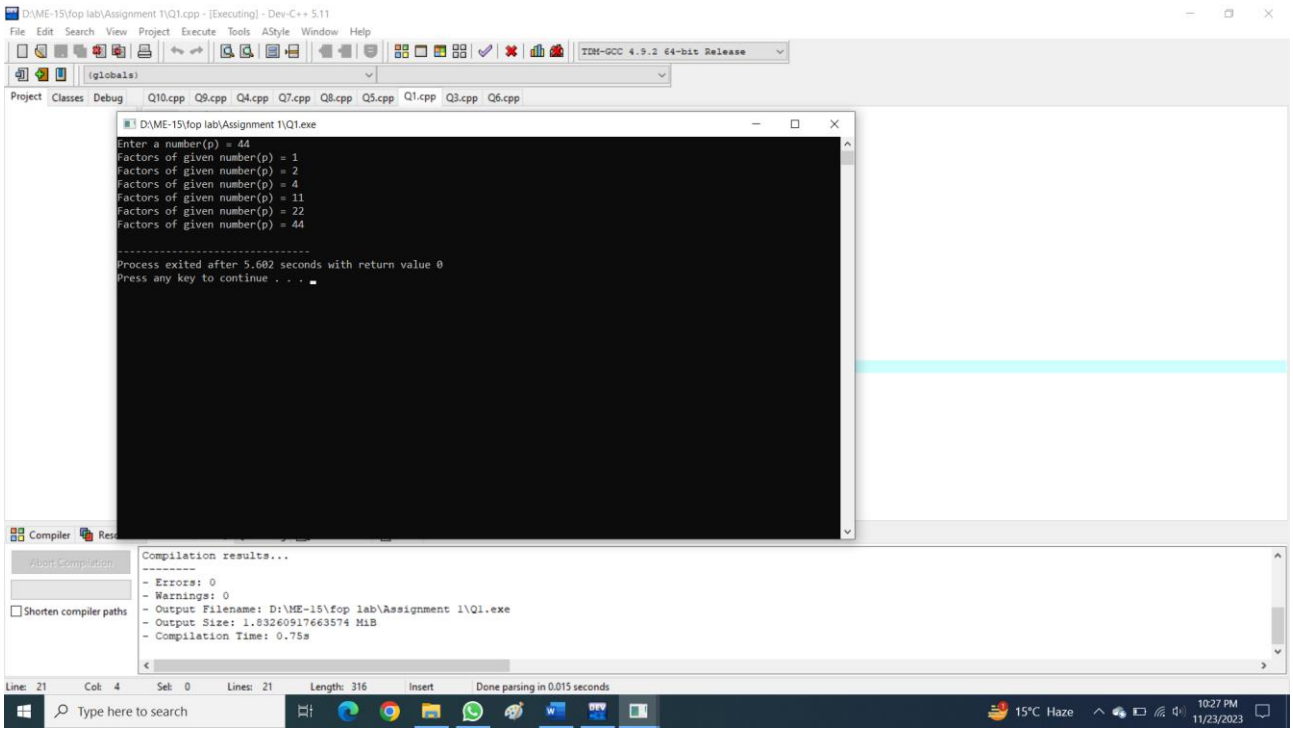
Section : C

1. Write a C++ program to display factors of a number using for loops.

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

int main()
{
int p;
cout<< "Enter a number(p) = ";
cin >> p;
bool n = false;

for(int i = 1; i <= p; i++){
if(p%i == 0){
n = true;
}
if(n== true){
cout << "Factors of given number(p) = " << i <<endl;
}
n = false;
}
return 0;
}
```



2. Write output to the following code.

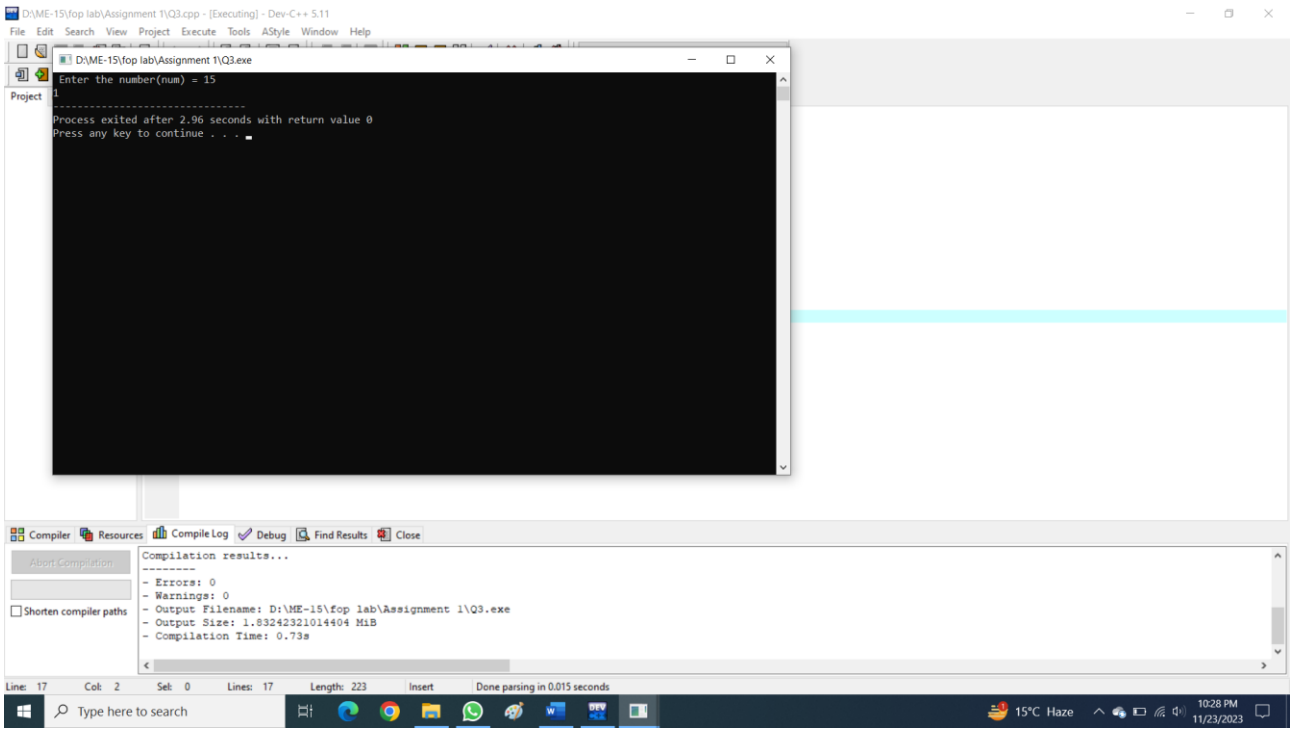
```
#include <iostream>

int main() {

int x = 5;

int y = 10;

if (x5)

if (y = 10) std::cout << "x is 5 and
y is 10" << std::endl; else std::cout
<< "x is not 5" << std::endl;

return 0:
```

OUTPUT:

x is 5 and y is 10

3. Write a C++ program, take an integer value from user and check if it's greater than 10 and less than equal to 20. Print 1 if yes and print 0 if no. Use appropriate datatype for output.

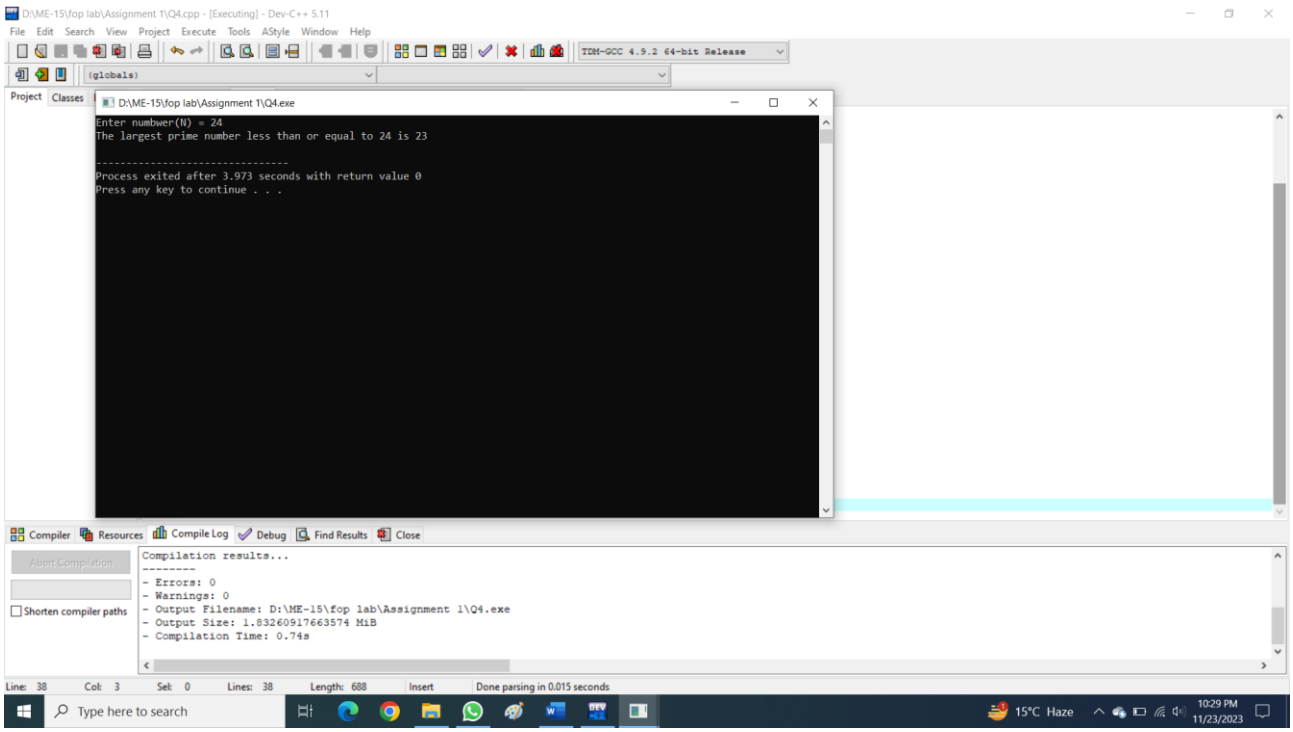
```
#include <iostream>
using namespace std;

int main()
{
int num;
cout << " Enter the number(num) = ";
cin >> num;

if( num >= 10 && num <= 20){
cout << "1" ;
}
else {
cout << "0";
}
return 0;
}
```



4. Write a C++ program that uses a while loop to find the largest prime number less than a given positive integer N. Your program should take the value of N as input from the user and then find the largest prime number less than or equal to N. You are not allowed to use any library or pre-existing functions to check for prime numbers.

```
#include <iostream>

using namespace std;


int main()

{


int N = 0;

cout << "Enter numbwer(N) = ";

cin >> N;

int count = 2;

int i = 1;

int largestPrime = 1;
```

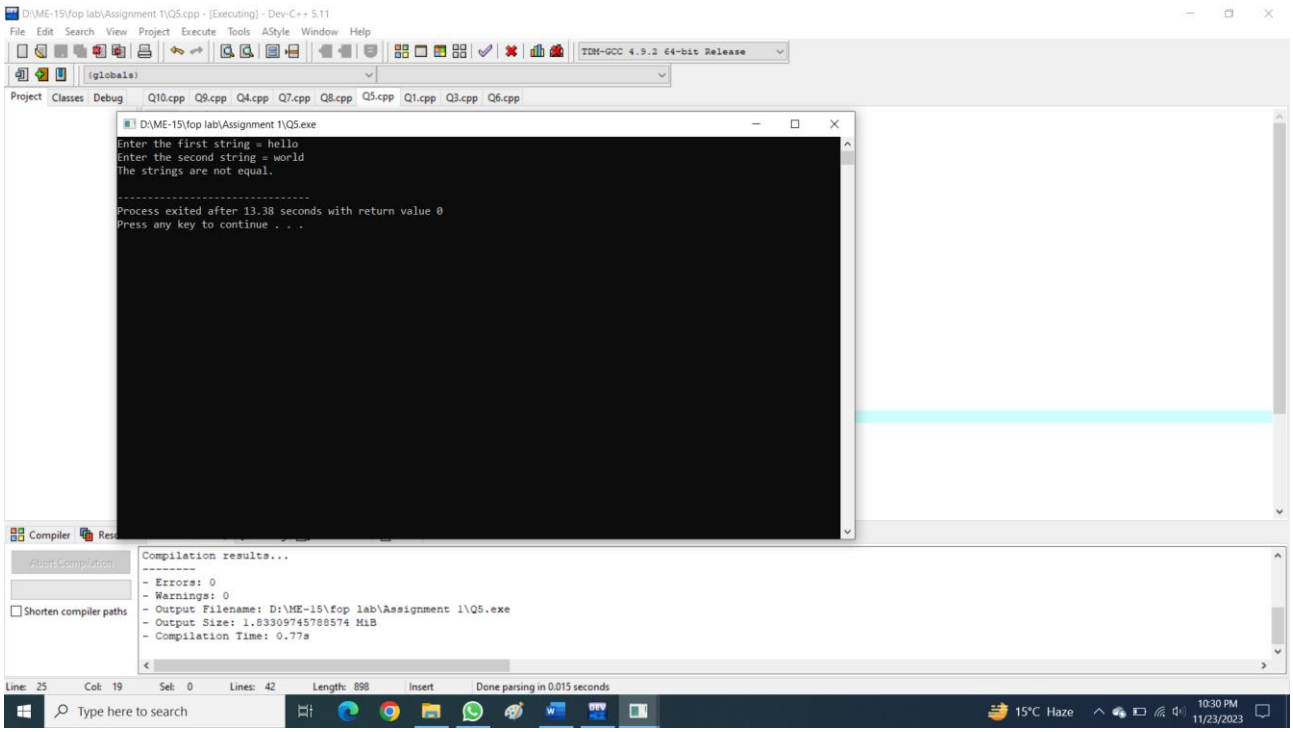
```
bool isPrime = true;


while (count<=N) {


isPrime = true;
i = 2;
while (i<count && isPrime==true) {


if (!(count % i == 0)){
isPrime = true;
}
else
{
isPrime = false;
}
i++;
}
if (isPrime==true) {
largestPrime = count;
}
count++;
}
cout << "The largest prime number less than or equal to "<< N << " is "<< largestPrime << endl;


return 0;
}
```



5. Write a C++ program, take two strings as input from user and check if both strings are equal or not. If they are equal, make them unequal by rotating string. e.g., Hello is turned into olleH etc.

```
#include <iostream>

using namespace std;


int main()

{


const int SIZE = 100;


char str1[SIZE], str2[SIZE];


cout << "Enter the first string = ";

cin >> str1;

cout << "Enter the second string = ";
```

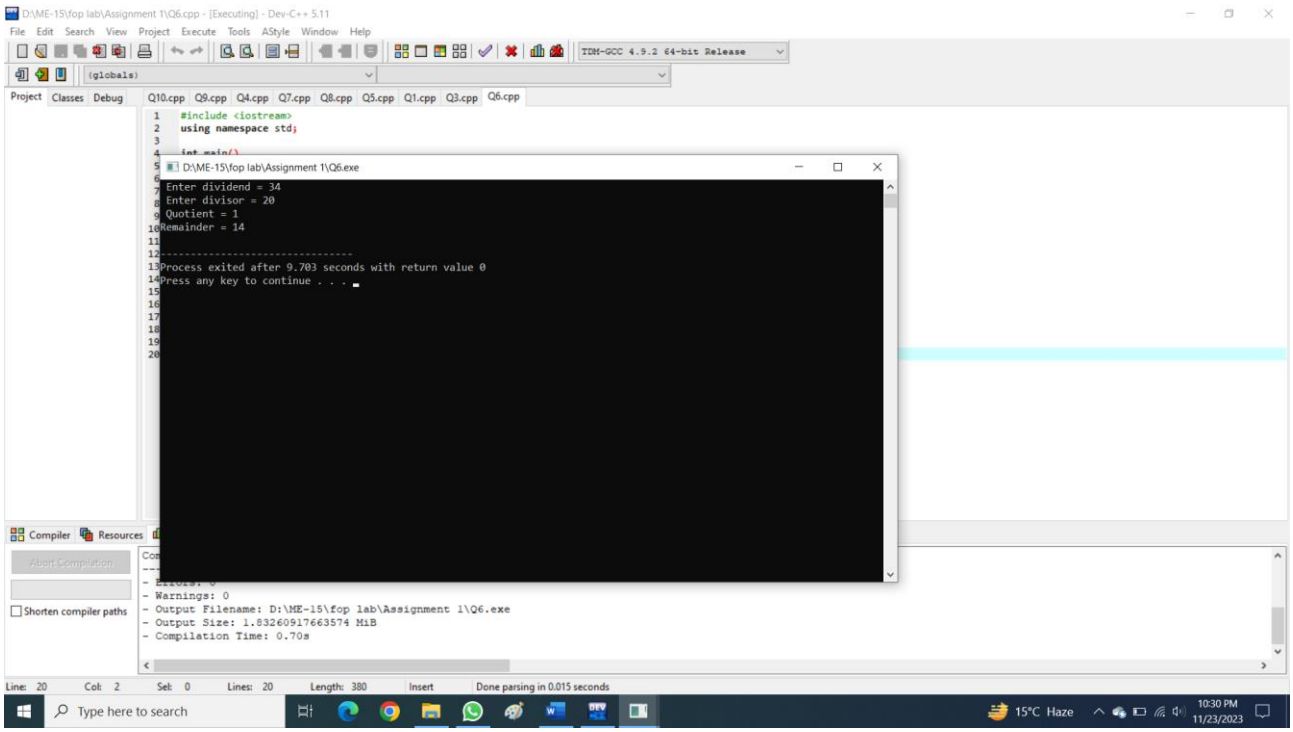
```
cin >> str2;

int i = 0;
while (str1[i] != '\0' && str2[i] != '\0' && str1[i] == str2[i]) {
i++;
}

if (str1[i] == '\0' && str2[i] == '\0') {

int len = 0;
while (str1[len] != '\0') {
len++;
}

char temp = str1[0];
for (int j = 0; j < len - 1; j++) {
str1[j] = str1[j + 1];
}
str1[len - 1] = temp;

cout << "After rotation, the first string = " << str1 << endl;
cout << "The second string remains = " << str2 << endl;
} else
{
cout << "The strings are not equal." << endl;
}

return 0;
}
```



6. Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater ater than divisor.

```
#include <iostream>

using namespace std;


int main()

{

int dividend, divisor, quotient = 0;

cout << " Enter dividend = ";

cin >> dividend;

cout << " Enter divisor = ";

cin >> divisor ;


while(dividend >= divisor){

dividend -= divisor;

quotient++;

}
```

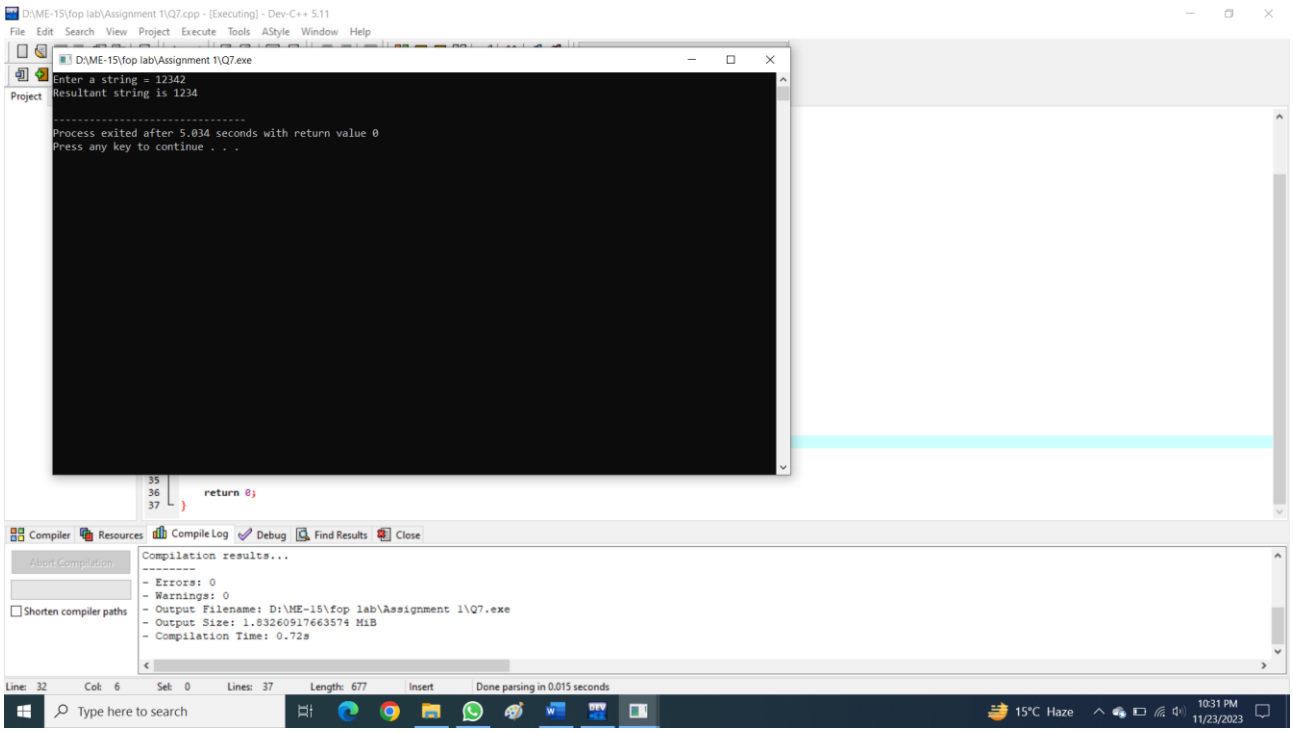
```
cout << " Quotient = " << quotient <<endl << "Remainder = "<< dividend << endl;


return 0;


}
```



7. Write a C++program for a string which may contain lowercase and uppercase characters. The task is to remove all duplicate characters from the string and find the resultant string.

```
#include <iostream>

using namespace std;


int main()

{


char str[100];

cout << "Enter a string = ";

cin >> str;
```

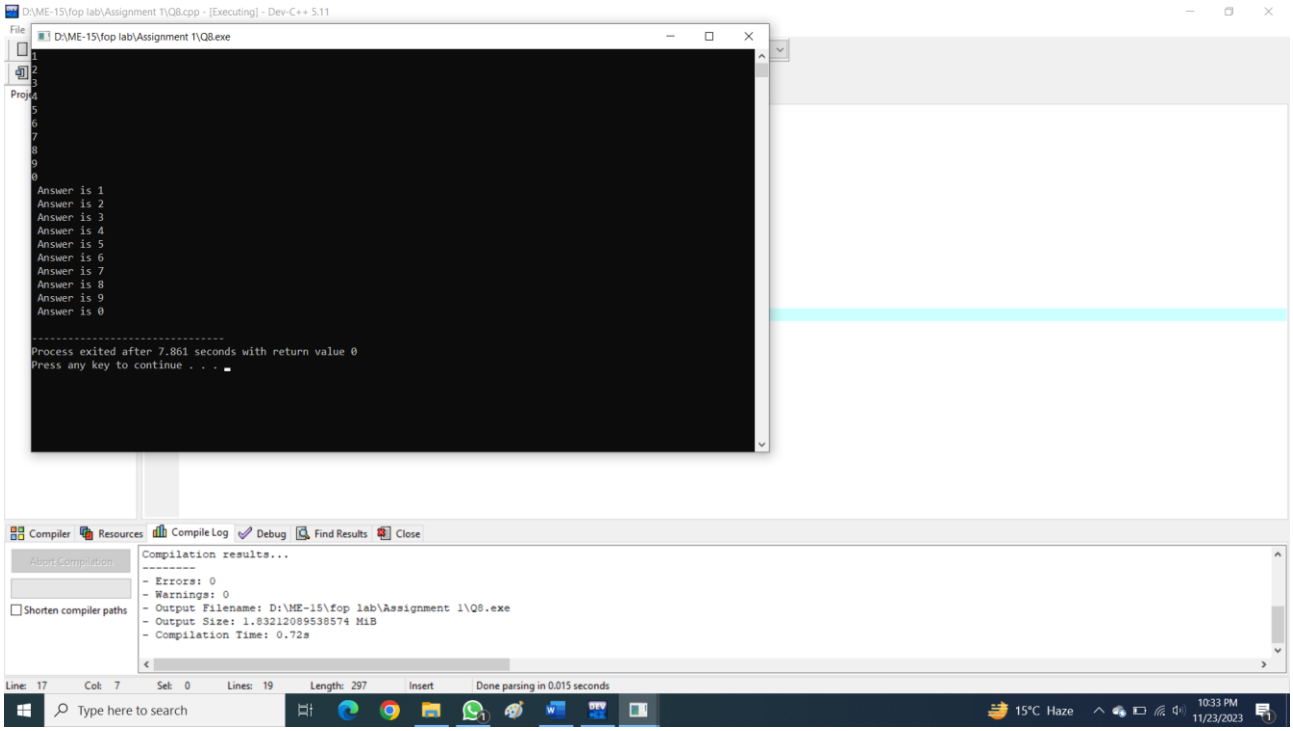
```
int len = 0;

while (str[len] != '\0') {
len++;
}

for (int i = 0; i < len; i++) {
for (int j = i + 1; j < len;) {
if (str[i] == str[j]) {

for (int k = j; k < len - 1; k++) {
str[k] = str[k + 1];
}
str[len - 1] = '\0';
len--;
}
else
{
j++;
}
}
}

cout << "Resultant string is " << str << endl;

return 0;
}
```



8. Suppose an integer array a[5] = {1,2,3,4,5). Add more elements to it and display them in C++.

```
#include <iostream>

using namespace std;


int main()

{


int arr[10] = { 1,2,3,4,5 };


for (int i = 0; i <= 9; i++) {

cin >> arr[i];

}


for (int i = 0; i <= 9; i++) {

cout<< " Answer is ";

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

```
}
return 0;
}
```

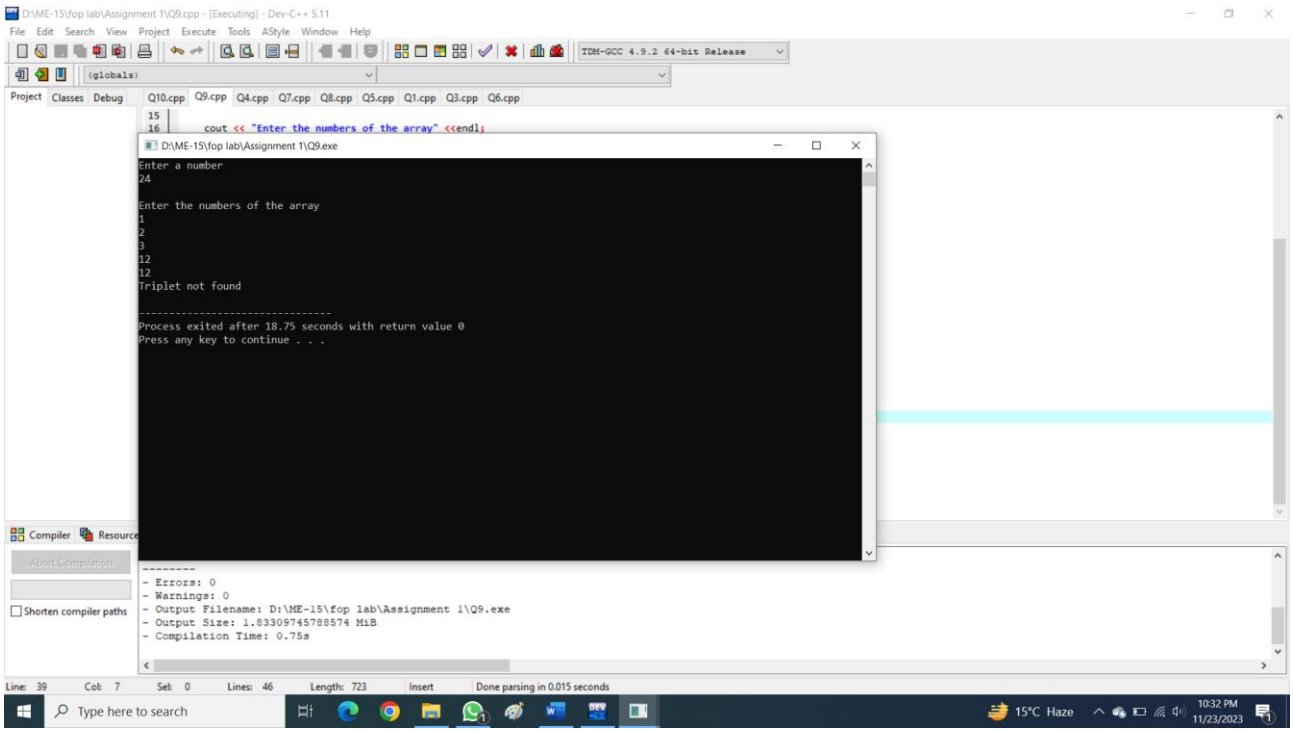


9. Given an integer array and an integer X. Find if there's a triplet in the array which sums up to the given integer X.

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

int main()
{

int arr[5];
int num = 0;
bool flag = false;

cout << "Enter a number"<< endl;
```

```
cin >> num;

cout << endl;

cout << "Enter the numbers of the array" <<endl;

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

cin >> arr[i];
}

for (int i = 0; i < 5; i++)
{
for (int j = 0; j < 5; j++)
{
for (int k = 0; k < 5; k++)
{
if (arr[i]+arr[j]+arr[k]==num)
{
flag = true;
}
}
}
}
if (!flag)
{
cout << "Triplet not found" << endl;
}
else
```

```
{
cout << "Triplet found" << endl;
}
return 0;
}
```



10. Implement Bubble Sort on an array of 6 integers.

```
#include <iostream>
using namespace std;
int main()
{
int arr[6];
cout << " Enter the array of 6 integers = ";

for (int i = 0; i < 6; i++)
{
cin >> arr[i];
}
for (int j = 0; j <= 6; j++)
{
for (int k = 0; k < 4;k++)
{
```

```
if (arr[k] > arr[k + 1])
{
int flag;
flag = arr[k];
arr[k] = arr[k + 1];
arr[k + 1] = flag;
}
}
}
cout << "The sorted array is = ";
for (int l = 0;l < 6;l++)
{
cout<< arr[l] << endl;
}
return 0;
```