

## **Assignment No: 1**

### **CS-114 – Fundamental of Programming**



**Submitted by:**

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**Section: 'C'**

**Submitted to:**

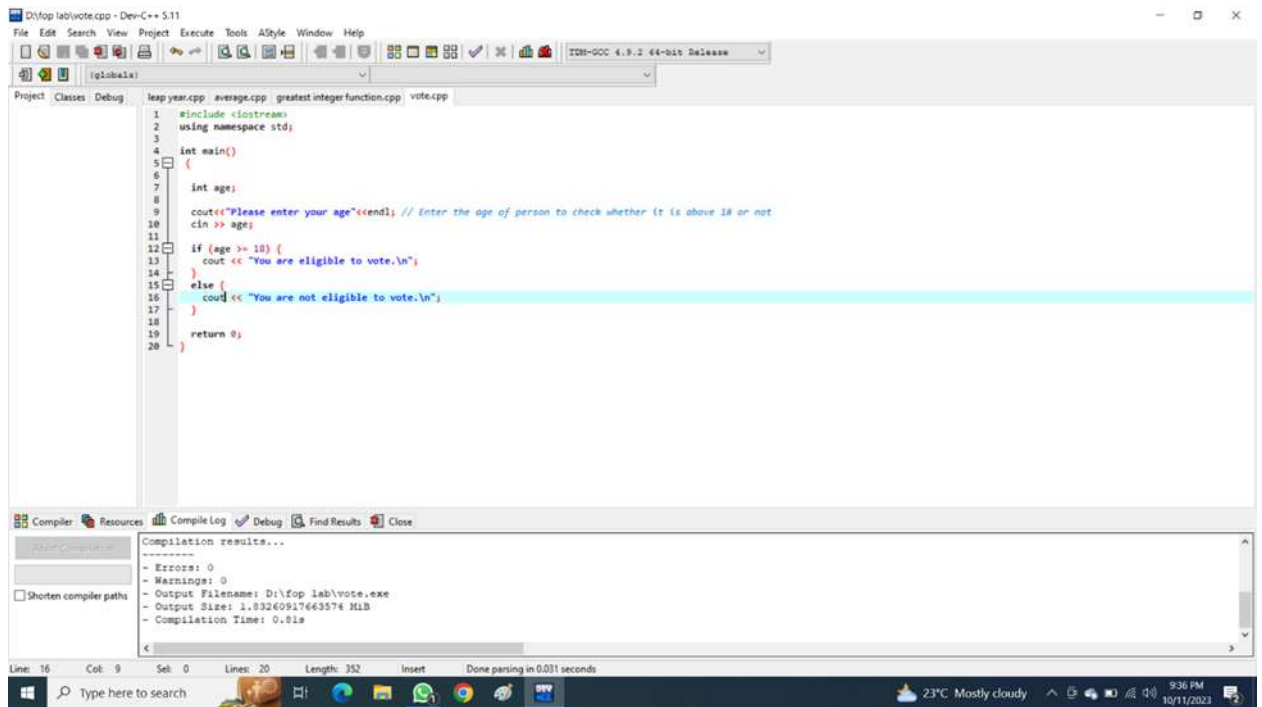
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## Lab Task: 2

1. Write a program that determines if a person is eligible to vote based on their age (e.g., 18 years or older) using logical operators.

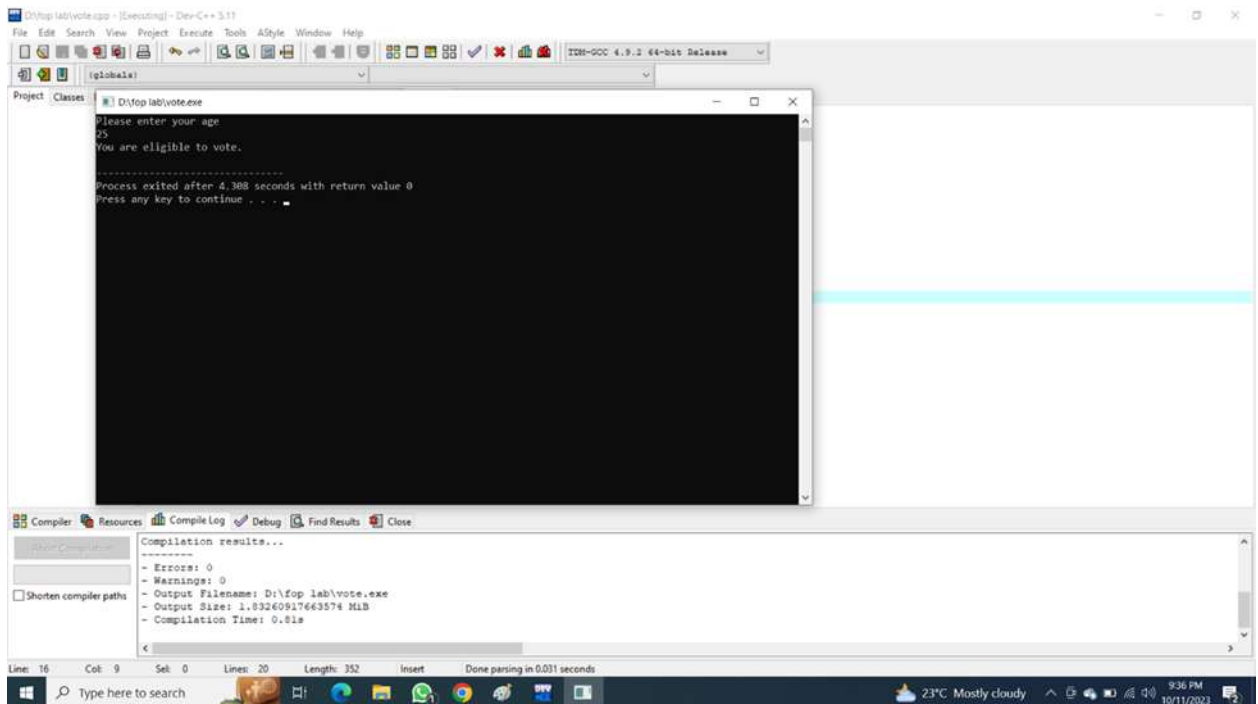


The screenshot shows the Dev-C++ IDE with the following code in the editor:

```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     int age;
7
8     cout<<"Please enter your age"<<endl; // Enter the age of person to check whether it is above 18 or not
9     cin >> age;
10
11     if (age >= 18) {
12         cout << "You are eligible to vote.\n";
13     }
14     else {
15         cout << "You are not eligible to vote.\n";
16     }
17
18     return 0;
19 }
```

The Compiler window shows the following compilation results:

```
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\vote.exe
- Output Size: 1.83260917663574 MiB
- Compilation Time: 0.81s
```



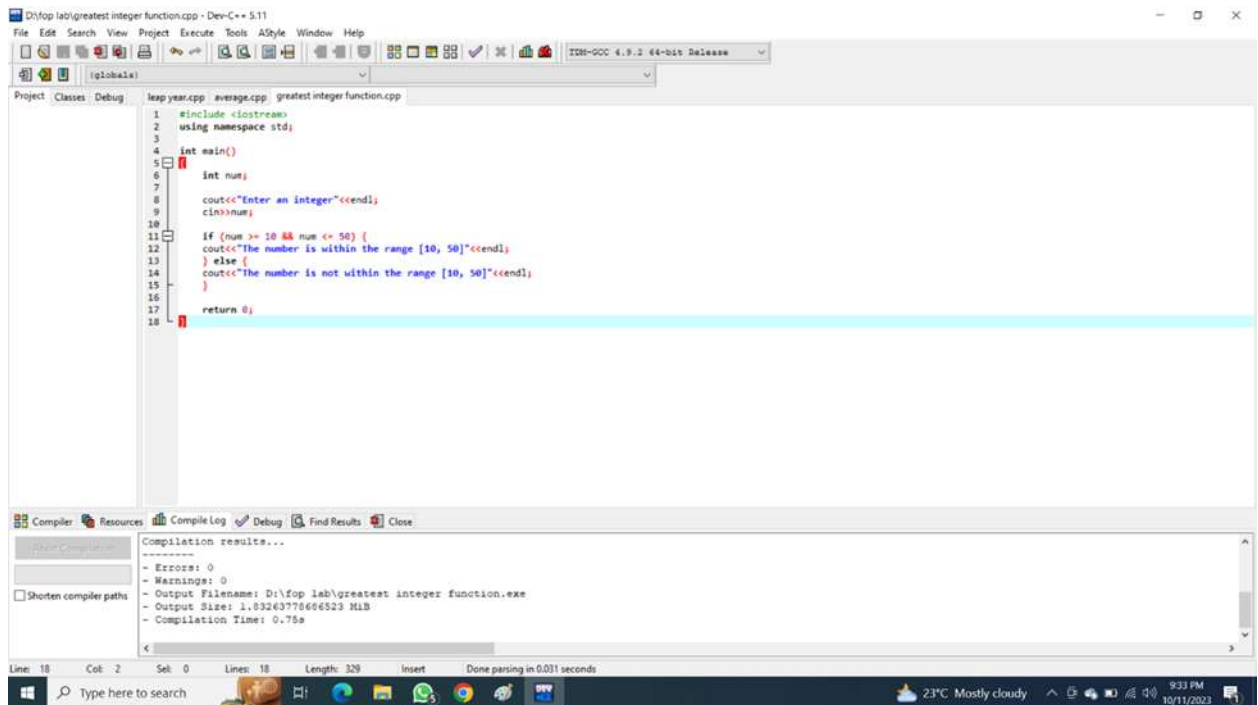
The screenshot shows the Dev-C++ IDE with the program running. The output window displays the following text:

```
Please enter your age
25
You are eligible to vote.
.....
Process exited after 4.388 seconds with return value 0
Press any key to continue . . .
```

The Compiler window shows the same compilation results as in the previous screenshot:

```
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\vote.exe
- Output Size: 1.83260917663574 MiB
- Compilation Time: 0.81s
```

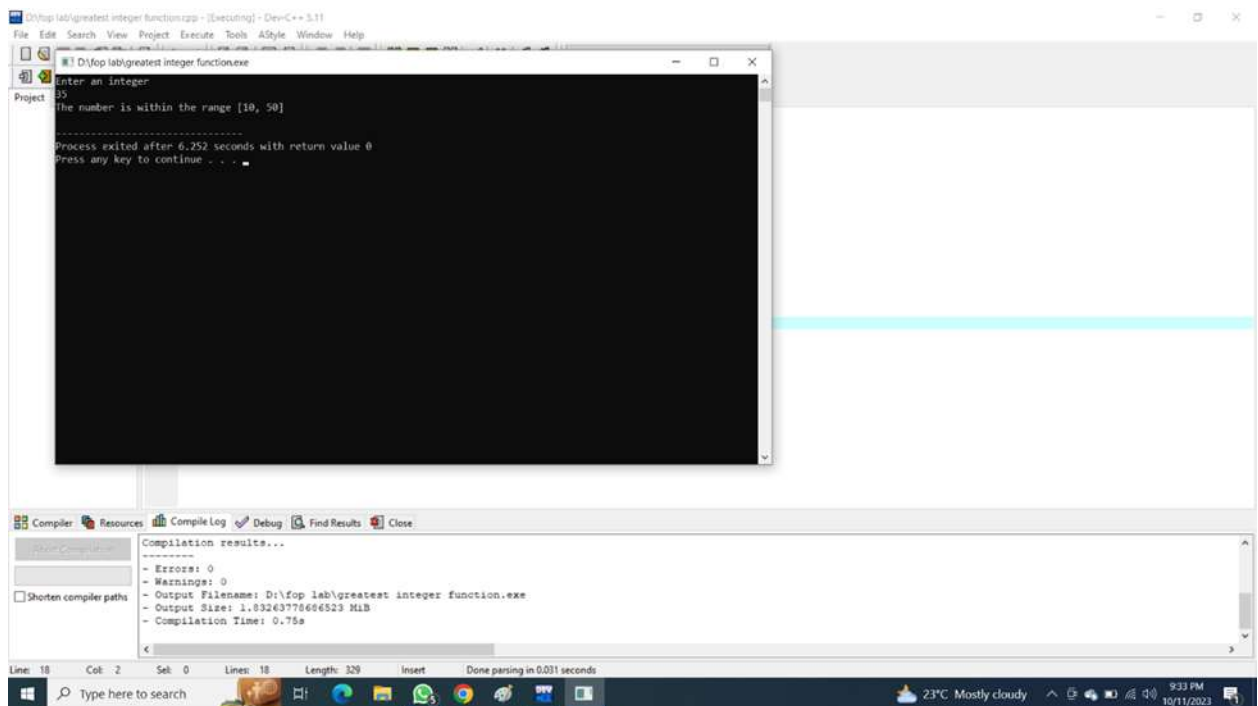
2. Write a program that takes an integer as input and checks if it falls within the range [10, 50] using logical operators.



```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     int num;
7     cout<<"Enter an integer"<<endl;
8     cin>>num;
9
10    if (num >= 10 && num <= 50) {
11        cout<<"The number is within the range [10, 50]"<<endl;
12    } else {
13        cout<<"The number is not within the range [10, 50]"<<endl;
14    }
15
16    return 0;
17 }
```

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\greatest integer function.exe
- Output Size: 1.83243778666523 MiB
- Compilation Time: 0.75s

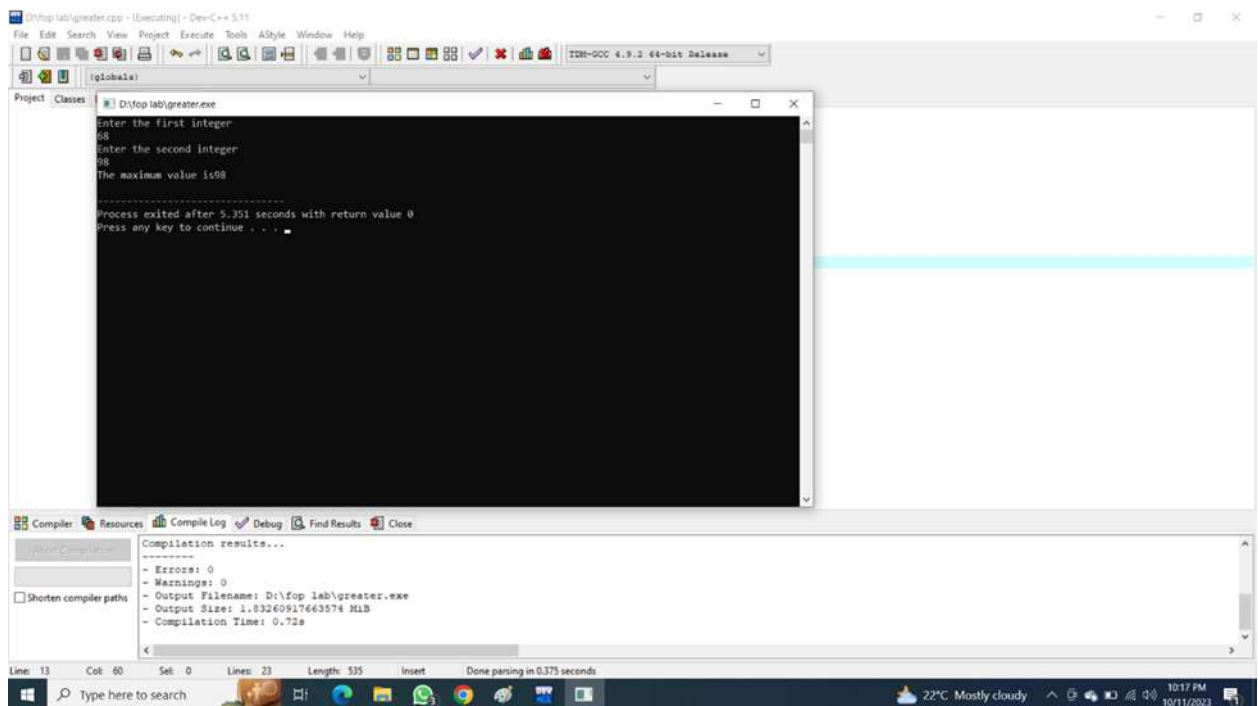
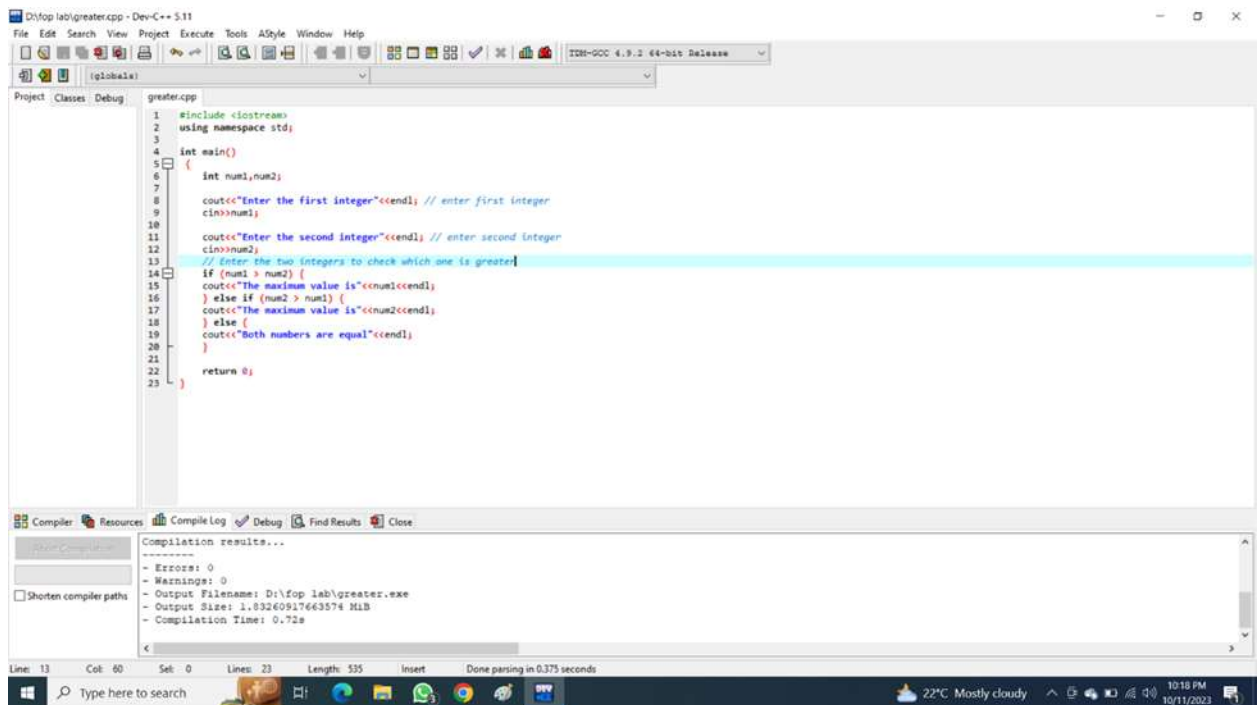


```
Enter an integer
35
The number is within the range [10, 50]
Process exited after 6.252 seconds with return value 0
Press any key to continue . . .
```

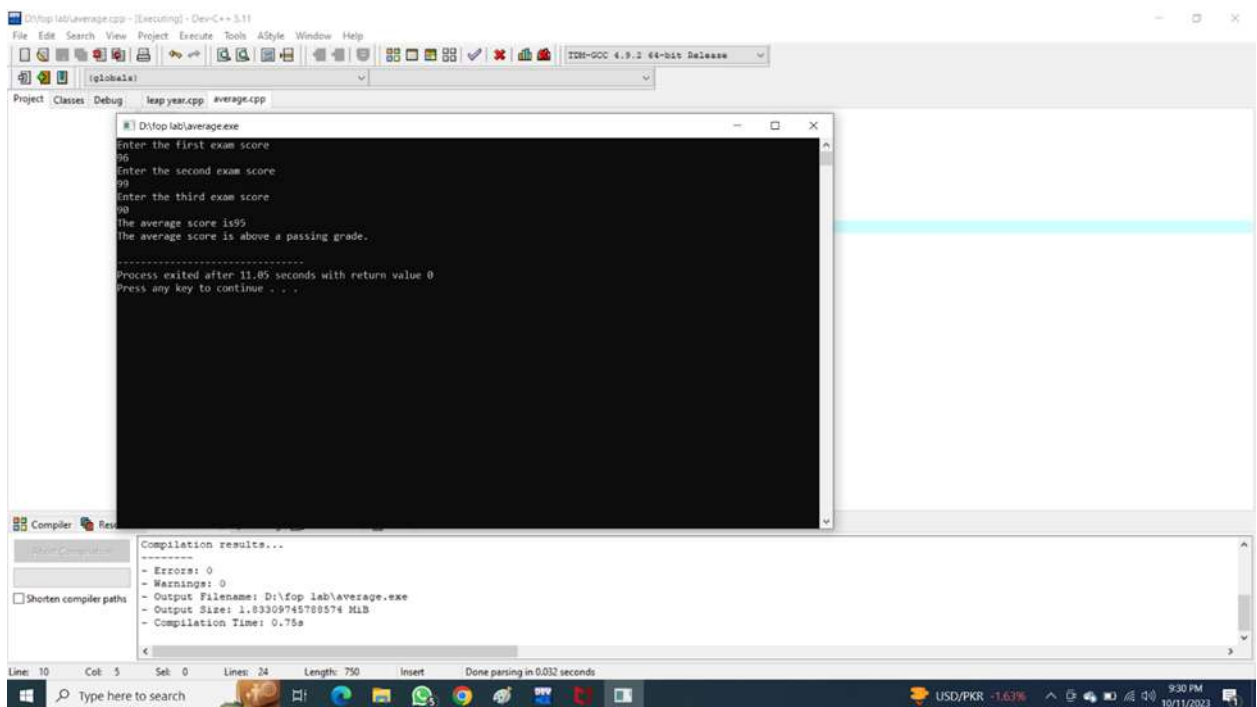
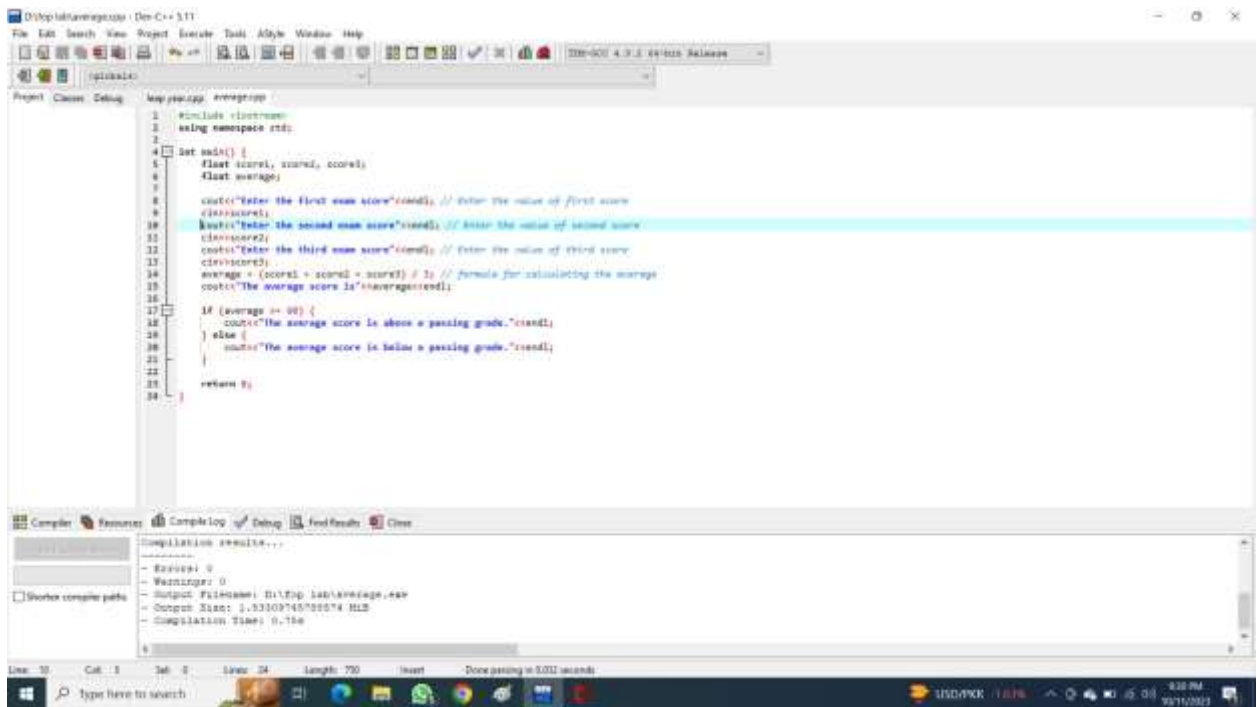
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\greatest integer function.exe
- Output Size: 1.83243778666523 MiB
- Compilation Time: 0.75s

3. Write a C++ program to compare two integers and find the maximum value.



4. Write a C++ program to calculate the average of three exam scores and determine if it's above a passing grade (e.g., average  $\geq 60$ ).



## Home Task: 2

- 1) Create a program that takes a student's score as input and assigns a grade based on predefined criteria using logical operators (e.g., A, B, C, D, F).

A-Grade: 90-100 Marks, B-Grade: 75-90 Marks, C-Grade: 60-75 Marks, D-Grade: 45-60 Marks, F-Grade: 0-45 Marks

The screenshot shows a C++ IDE with the file `D:\fop lab\marks.cpp` open. The code is a grading calculator that takes an integer input and outputs a grade from A to F based on specific mark ranges. The code is as follows:

```
1 #include<iostream>
2 using namespace std;
3
4 int main()
5 {
6     // grading calculator
7     int marks;
8
9     cout<<"enter the marks \n ";
10    cin>>marks;
11
12    if ( marks >= 90 && marks <= 100 ) cout<<" Grade A"; // grade A from 90 to 100
13    else if ( marks >= 80 && marks < 90 ) cout<<" Grade B"; // grade B from 80 to less than 90
14    else if ( marks >= 75 && marks < 80 ) cout<<" Grade C"; // grade C from 75 to less than 80
15    else if ( marks >= 60 && marks < 85 ) cout<<" Grade D"; // grade D from 60 to less than 75
16    else if ( marks >= 45 && marks < 60 ) cout<<" Grade E"; // grade E from 45 to less than 60
17    else if ( marks >= 0 && marks < 45 ) cout<<" Grade F"; // grade F from 0 to less than 45
18
19    return 0;
20 }
21
```

The IDE's output window shows the compilation results:

```
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\marks.exe
- Output Size: 1.83242321014404 MiB
- Compilation Time: 0.72s
```

The status bar at the bottom indicates the current line is 9, column 34, and the file length is 714 bytes.

The screenshot shows the same C++ IDE with the program executed. A console window titled `D:\fop lab\marks.exe` is open, displaying the program's output:

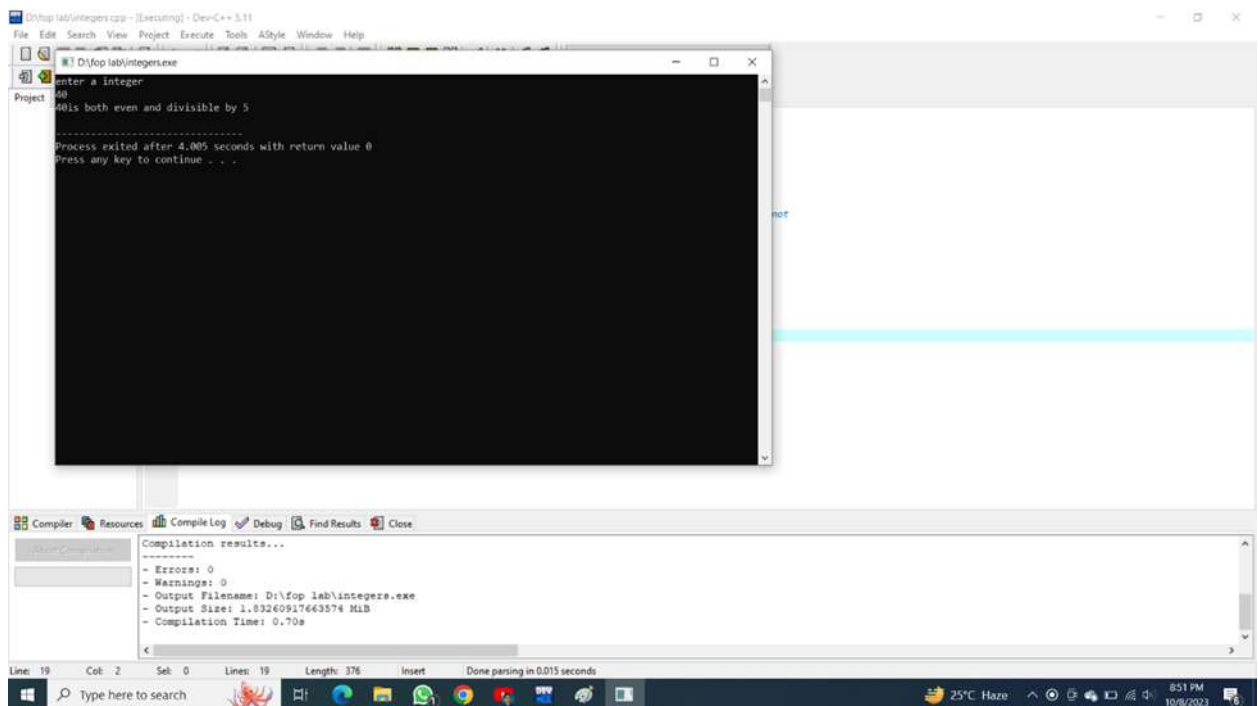
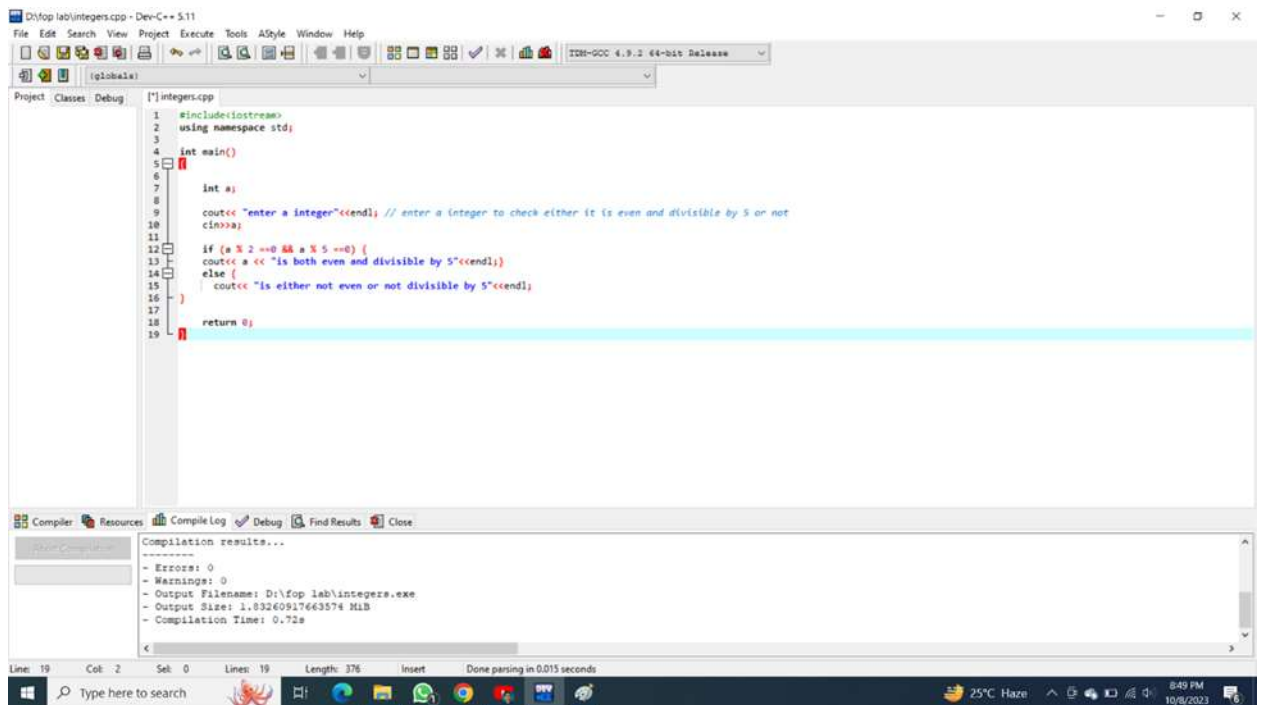
```
enter the marks
55
Grade E
-----
Process exited after 3.739 seconds with return value 0
Press any key to continue . . .
```

The IDE's output window shows the same compilation results as before:

```
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\marks.exe
- Output Size: 1.83242321014404 MiB
- Compilation Time: 0.70s
```

The status bar at the bottom indicates the current line is 5, column 2, and the file length is 714 bytes.

2)Write a program that takes an integer as input and determines if it is both even and divisible by 5



3. Create a C++ program that checks if a user-provided year is a leap year.

The screenshot shows the Dev-C++ IDE with a C++ program for determining leap years. The code is as follows:

```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     int year;
7     cout << "Enter a year " << endl; // Enter year to check that it is leap year or not
8     cin >> year;
9
10    if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
11        cout << year << " is a leap year." << endl;
12    } else {
13        cout << year << " is not a leap year." << endl;
14    }
15
16    return 0;
17 }
```

The bottom panel shows the compilation results:

```
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\leap year.exe
- Output Size: 1.03260917663574 MiB
- Compilation Time: 0.69s
```

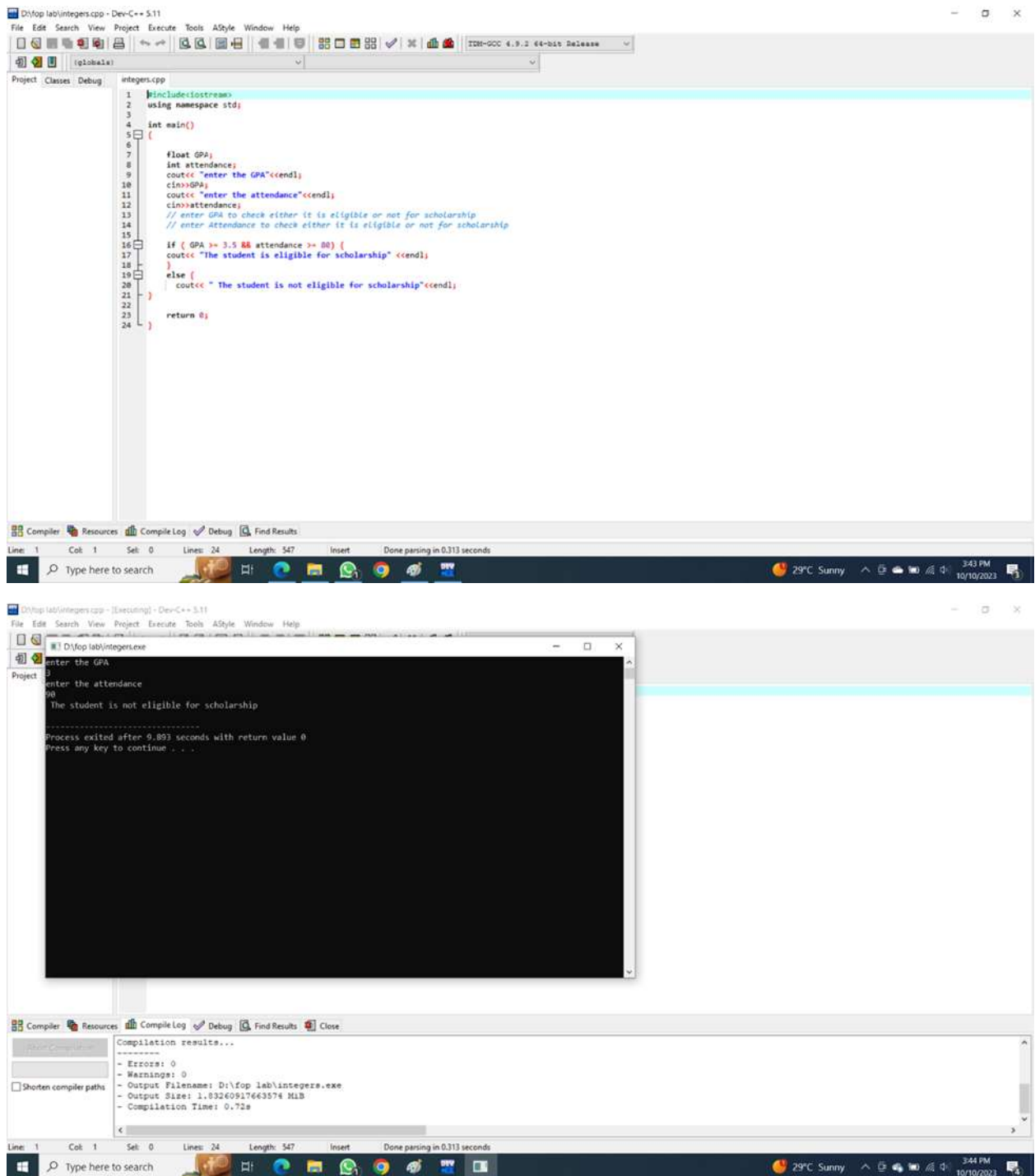
The screenshot shows the same Dev-C++ IDE with the program executed. A console window is open, displaying the following output:

```
D:\fop lab\leap year.exe
Enter a year
2020
2020 is not a leap year.
Process exited after 4.047 seconds with return value 0
Press any key to continue . . .
```

The bottom panel shows the same compilation results as the previous screenshot.

4. Create a C++ program that determines if a student is eligible for a scholarship based on their GPA (must have GPA  $\geq 3.5$ ) and attendance (must have attended at least 80% of classes).





5. Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.

```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     char character;
7     // to check either alphabet is vowel or consonant, so enter character
8
9     cout << "Enter a character:\n";
10    cin >> character;
11
12    if (character == 'a' || character == 'e' || character == 'i' || character == 'o' || character == 'u') {
13        cout << character << " is a vowel." << endl;
14    } else if (character == 'A' || character == 'E') {
15        cout << character << " is a vowel." << endl;
16    } else {
17        cout << "Invalid input. Please enter a valid alphabet character." << endl;
18    }
19
20    return 0;
21 }
```

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\Top lab\Untitled2.exe
- Output Size: 1.53260917463574 MiB
- Compilation Time: 0.70s

Enter a character  
a  
a is a vowel.

Process exited after 3.262 seconds with return value 0  
Press any key to continue . . .

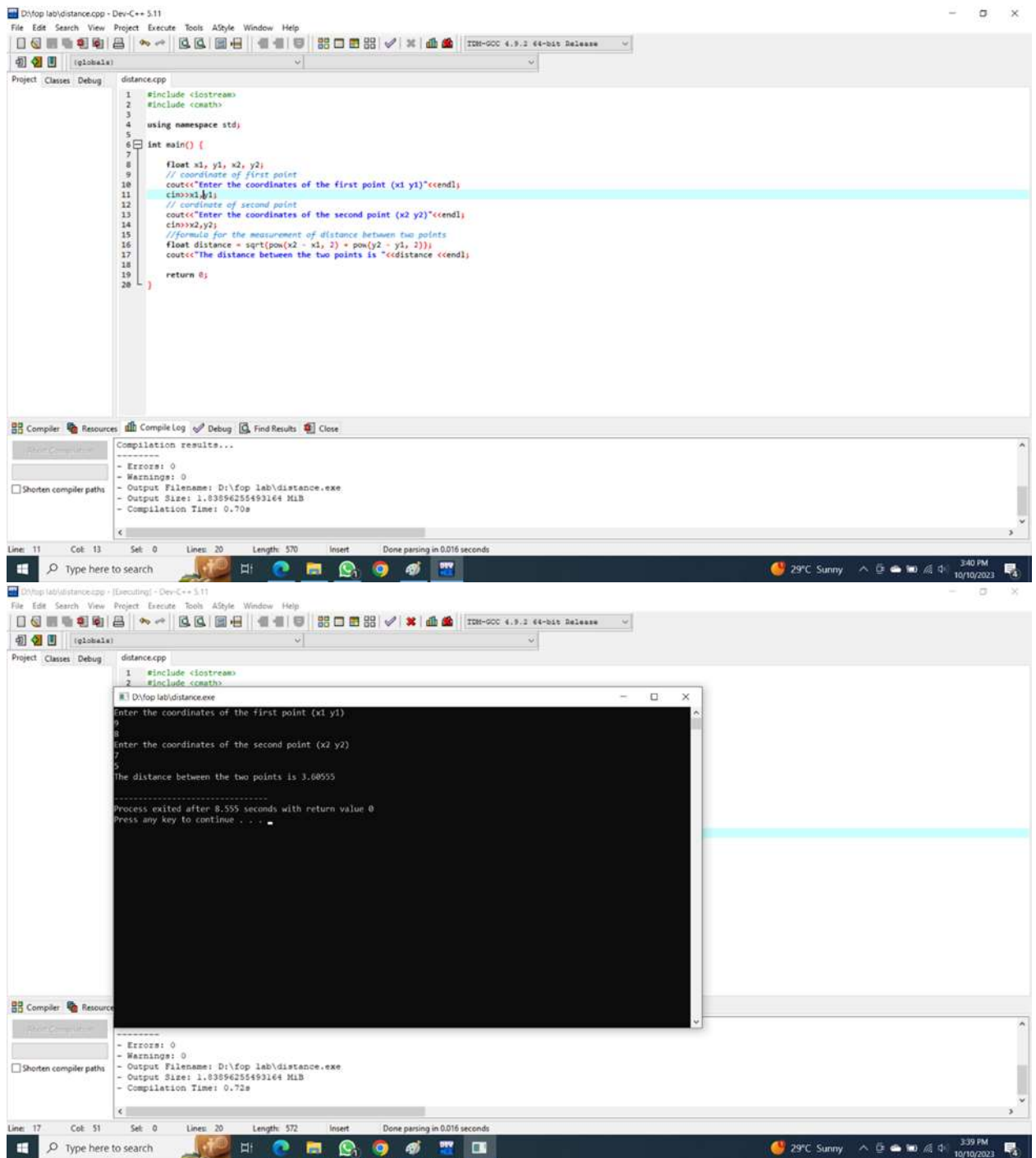
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\Top lab\Untitled2.exe
- Output Size: 1.53260917463574 MiB
- Compilation Time: 0.70s

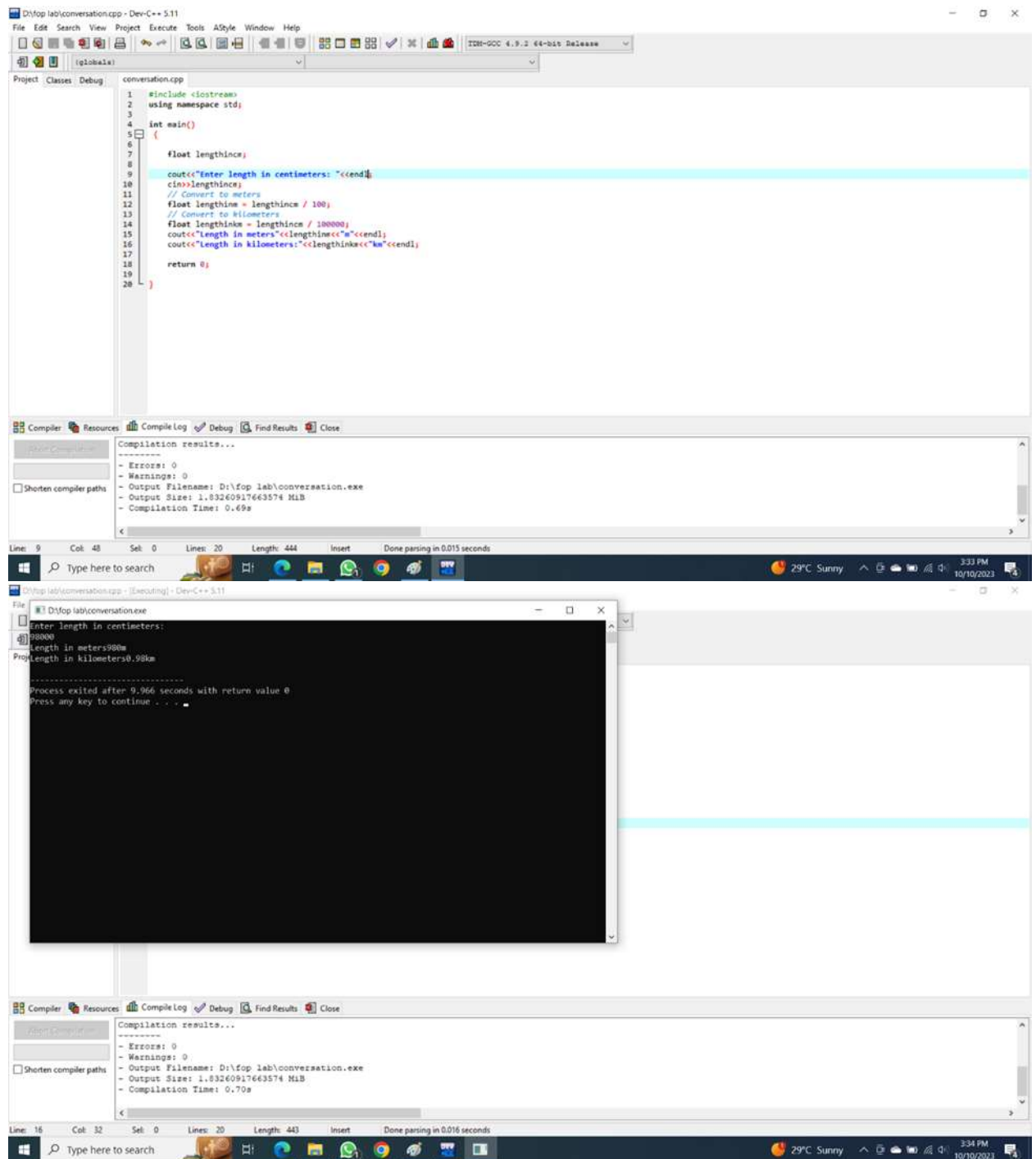
## Home Task 1

1) Write a C++ program to calculate distance between two points. The values of coordinates should be input by user.

$$d = (x_2 - x_1)^2 + (y_2 - y_1)^2$$



2)Write a code in C + to take length from user in centimeter and convert it into meter and kilometer.



3)Write a code in C ++ that takes values of a and b from the user and displays result of polynomial

$$a^2 + 2ab + b^2$$

```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     int a, b;
7     // to find the value of (a + b)^4
8     cout<<"Enter the value of 'a' "<<endl;
9     cin>>a;
10    cout<<"Enter the value of 'b' "<<endl;
11    cin>>b;
12    int result = a*a + 2*a*b + b*b ;
13    cout<<"The result of the polynomial a^2 + 2ab + b^2 is"<<result<<endl;
14    return 0;
15 }
```

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: D:\fop lab\lab\exe
- Output Size: 1.03260917663574 MiB
- Compilation Time: 0.72s

```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     int a, b;
7     // to find the value of (a + b)^4
8     cout<<"Enter the value of 'a' "<<endl;
9     cin>>a;
10    cout<<"Enter the value of 'b' "<<endl;
11    cin>>b;
12    int result = a*a + 2*a*b + b*b ;
13    cout<<"The result of the polynomial a^2 + 2ab + b^2 is"<<result<<endl;
14    return 0;
15 }
```

Enter the value of 'a'

Enter the value of 'b'

The result of the polynomial a^2 + 2ab + b^2 is 36

Process exited after 0.718 seconds with return value 0

Press any key to continue . . .

4)Write a program in C++ to convert temperature in Fahrenheit to Celsius.

