

# Object Oriented Programming

## CSC-241



### Lab # 01 Review of Basic Programming Concepts

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### Lab Assessment

Pre-Lab	In-Lab	Post Lab			Total
		Data Presentation	Data Analysis	Writing Style	

## LAB TASKS

**5.3.** Write a function that swaps the values of two integer variables

**A.** using pass by value

```
#include<iostream>

using namespace std;

void swap (int &num1, int &num2)
{
    int
    temp;

    temp=num1;

    num1=num2;

    num2=temp;
} int main()
{
    int a=55,b=101;

    cout<<"\n Before swapping"<<"\n A = "<<a<<"\n B = "<<b<<endl;

    swap(a,b);

    cout<<"\n After swapping"<<"\n A = "<<a<<"\n B = "<<b<<endl;

    return 0;
}
```

The screenshot shows a C++ IDE window titled "Project2 - [TASK 3.dev] - [Executing] - Dev-C++ 5.11". The code in the editor is as follows:

```
1 #include<iostream>
2 using namespace std;
3 void swap (int &num1, int &num2) //&num1 and &num2 are Reference variables
4 {
5     int temp;
6     temp=num1;
7     num1=num2;
8     num2=temp;
9 }
10 int main()
11 {
12     int a=55,b=101;
13     cout<<"\n Before swapping"<<"\n A = "<<a<<"\n B = "<<b<<endl;
14     swap(a,b);
15     cout<<"\n After swapping"<<"\n A = "<<a<<"\n B = "<<b<<endl;
16     return 0;
17 }
```

The "Compiler" tab at the bottom shows the following compilation results:

```
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe
- Output Size: 1.83264446258545 MiB
- Compilation Time: 1.25s
```

The status bar at the bottom indicates "Line: 2 Col: 21 Sel: 0 Lines: 17 Length: 427 Insert Done parsing in 0.312 seconds".

## Output:

The screenshot shows a command prompt window titled "C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe". The output of the program is as follows:

```
Before swapping
A = 55
B = 101

After swapping
A = 101
B = 55

-----
Process exited after 0.02389 seconds with return value 0
Press any key to continue . . .
```

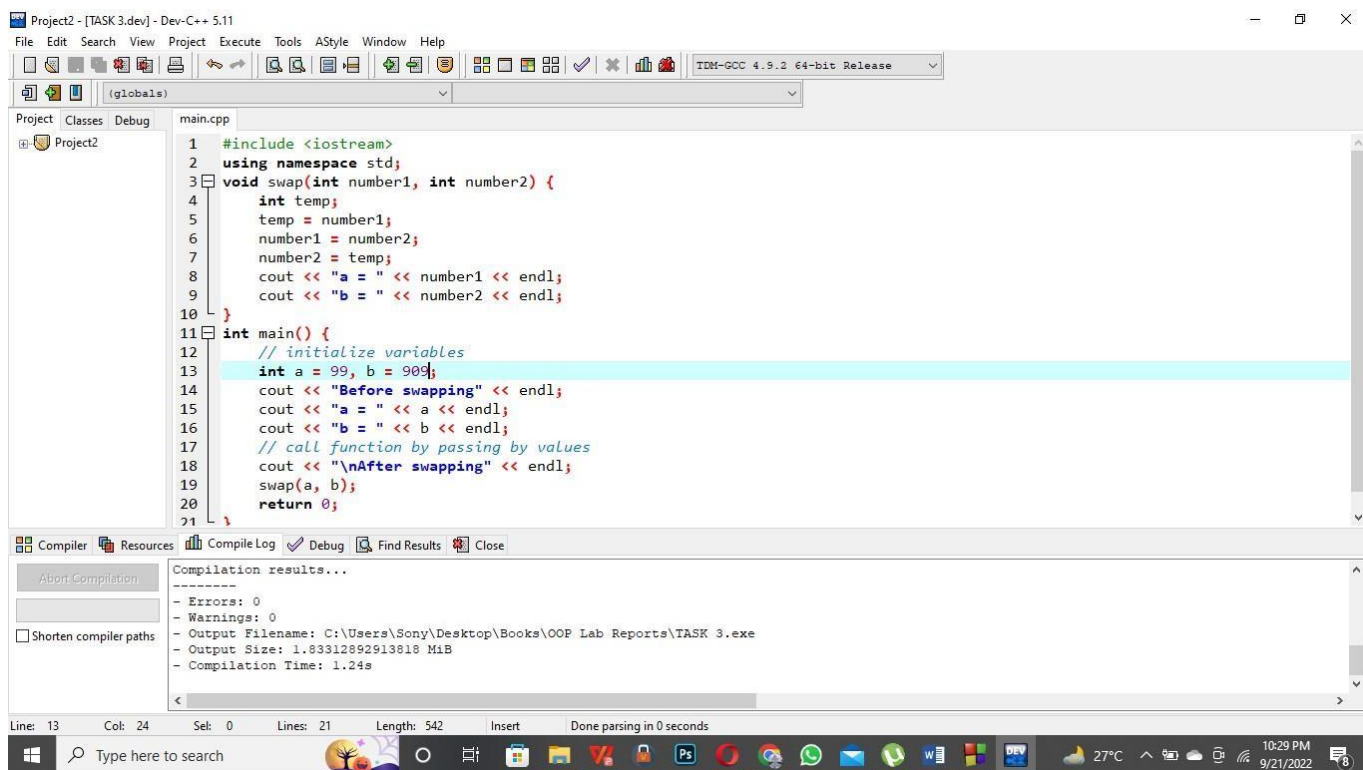
The status bar at the bottom indicates "Type here to search" and "27°C 10:24 PM 9/21/2022".

## B. Pass by references

```

#include <iostream> using namespace
std;
void swap(int number1, int number2)
{   int temp;   temp = number1;
number1 = number2;   number2 =
temp;   cout << "a = " << number1
<< endl;   cout << "b = " << number2
<< endl;
}
int main() {
    // initialize variables
int a = 99, b = 909;
    cout << "Before swapping" << endl;
cout << "a = " << a << endl;   cout <<
"b = " << b << endl;   // call function
by passing by values   cout <<
"\nAfter swapping" << endl;
swap(a, b);   return 0;
}

```



The screenshot shows the Dev-C++ IDE interface. The main editor displays the C++ code for a swap function and a main function. The code is as follows:

```

1  #include <iostream>
2  using namespace std;
3  void swap(int number1, int number2) {
4      int temp;
5      temp = number1;
6      number1 = number2;
7      number2 = temp;
8      cout << "a = " << number1 << endl;
9      cout << "b = " << number2 << endl;
10 }
11 int main() {
12     // initialize variables
13     int a = 99, b = 909;
14     cout << "Before swapping" << endl;
15     cout << "a = " << a << endl;
16     cout << "b = " << b << endl;
17     // call function by passing by values
18     cout << "\nAfter swapping" << endl;
19     swap(a, b);
20     return 0;
21 }

```

The output window at the bottom shows the compilation results:

```

Compilation results...
-----
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe
- Output Size: 1.83312892913818 MiB
- Compilation Time: 1.24s

```

The status bar at the bottom indicates the current line is 13, column is 24, and the program is done parsing in 0 seconds.

**Output:**

```
C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe
Before swapping
a = 99
b = 909

After swapping
a = 909
b = 99

-----
Process exited after 0.2286 seconds with return value 0
Press any key to continue . . .
```

**5.1.** Write a program that declares a structure to store book Id, price and pages of a book. The structure should include functions to assign user defined values to each book and display the record of most costly book.

```
#include <iostream> using
namespace std;
    struct Book
    {

    int b_id;

    char b_name[50];

    int price; int pages;
    };

    struct Order

    {int i;

    int order_id; Book b[200];
    };

    int main()

    {

    Order c;

    cout<<"Enter number of books :"; int n; cin>>n;
```

```

cout<<"Enter your Order Id: "; cin>>c.order_id;
cout<<"Enter details of books: \n"; for(int i=0;i<n;i++) {

cout<<"\nEnter Book Id: "; cin>>c.b[i].b_id;

cout<<"Enter Book Name: "; cin>>c.b[i].b_name; cout<<
" Enter Price of the Book: "; cin>>c.b[i].price; cout<<
"Enter book pages:"; cin>>c.b[i].pages; }

cout<<"\n Detail of order is: "<<endl; cout<<" Order Id: "<<c.order_id<<endl;
cout<<" Book Id \t Book Name \t Price \t Pages"<<endl; for(int i=0;i<n;i++) {

cout<<c.b[i].b_id<<"\t"<<c.b[i].b_name<<"\t"<<c.b[i].price<<"\t"<<c.b[i].pages<<endl;

}

int i ; int x=0;
for(int i=0;i<n;i++) if(c.b[0].price<c.b[i].price) x=i; cout<<"Most costly book detail is :\n";
cout<<c.b[x].b_id<<"\t"<<c.b[x].b_name<<"\t"<<c.b[x].price<<endl;
}

```

The screenshot shows a C++ IDE with the following components:

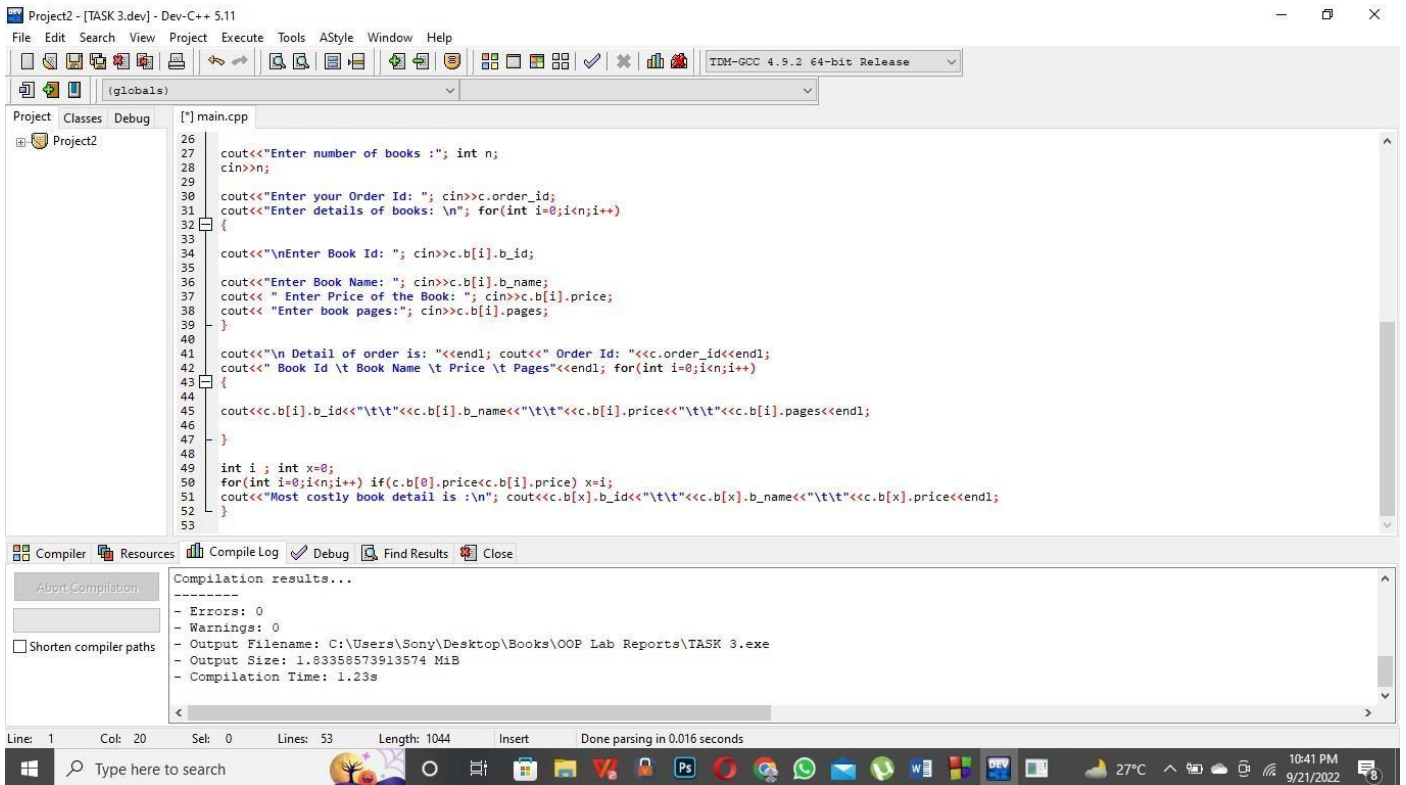
- Project2 - [TASK 3.dev] - Dev-C++ 5.11**: The main window title.
- File Edit Search View Project Execute Tools AStyle Window Help**: The menu bar.
- Compiler: TDM-GCC 4.9.2 64-bit Release**: The compiler selection dropdown.
- Project2**: The project name in the left sidebar.
- [\*] main.cpp**: The active source file.
- Source Code**: The main.cpp file content, showing the struct definitions and main function logic.
- Compiler**: The compiler status icon.
- Resources**: The resources icon.
- Compile Log**: The compile log icon.
- Debug**: The debug icon.
- Find Results**: The find results icon.
- Close**: The close button for the output window.
- Compilation results...**: The output window showing the compilation results.
- Shorten compiler paths**: A checkbox to shorten the compiler paths.
- Line: 1 Col: 20 Sek: 0 Lines: 53 Length: 1044 Insert Done parsing in 0.016 seconds**: The status bar information.
- Windows Taskbar**: The Windows taskbar at the bottom, showing the search bar, taskbar icons, and system tray.

**Compilation results...**

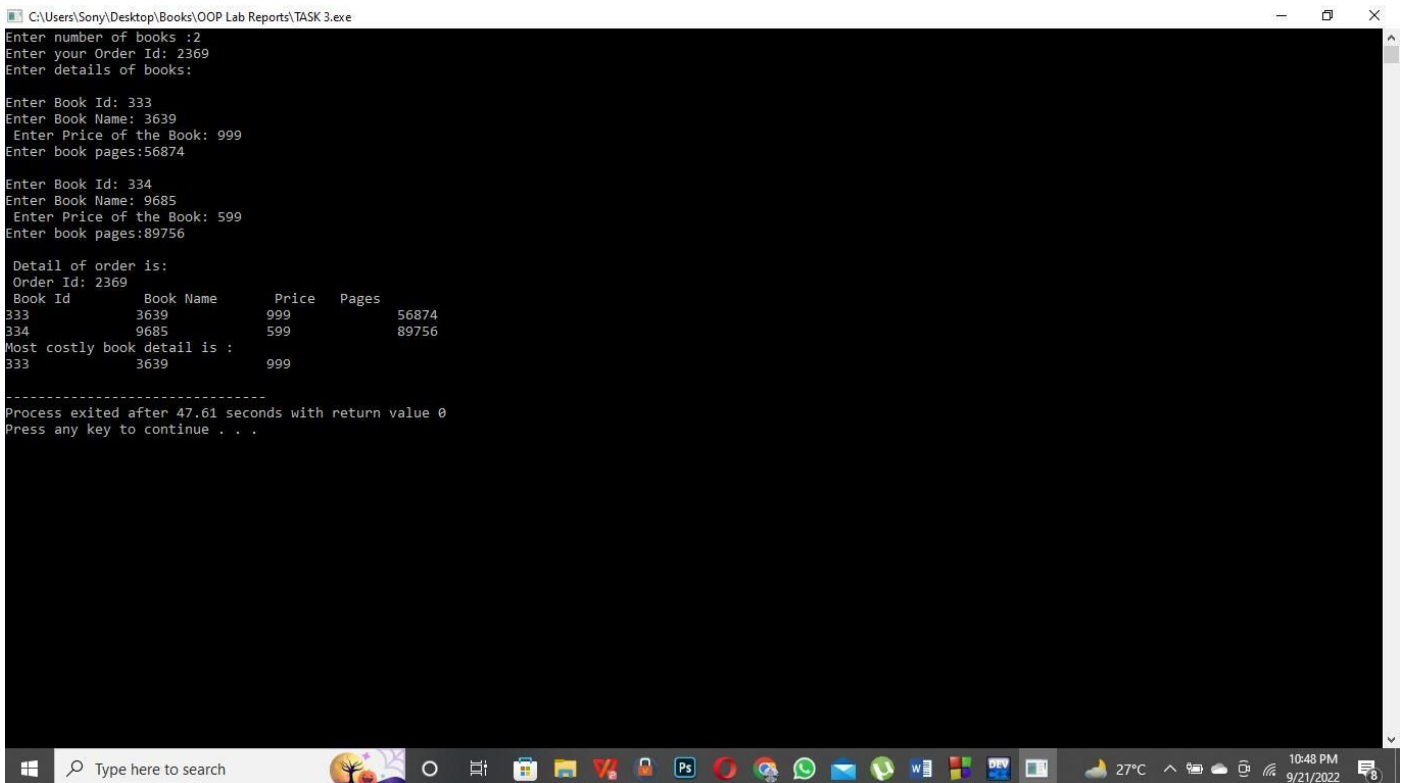
```

-----
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe
- Output Size: 1.83358573913574 MiB
- Compilation Time: 1.23s

```



## Output:



**5.2.** Write a program to take the values of two integers and use pointers to add 10 to the value of each integer.

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

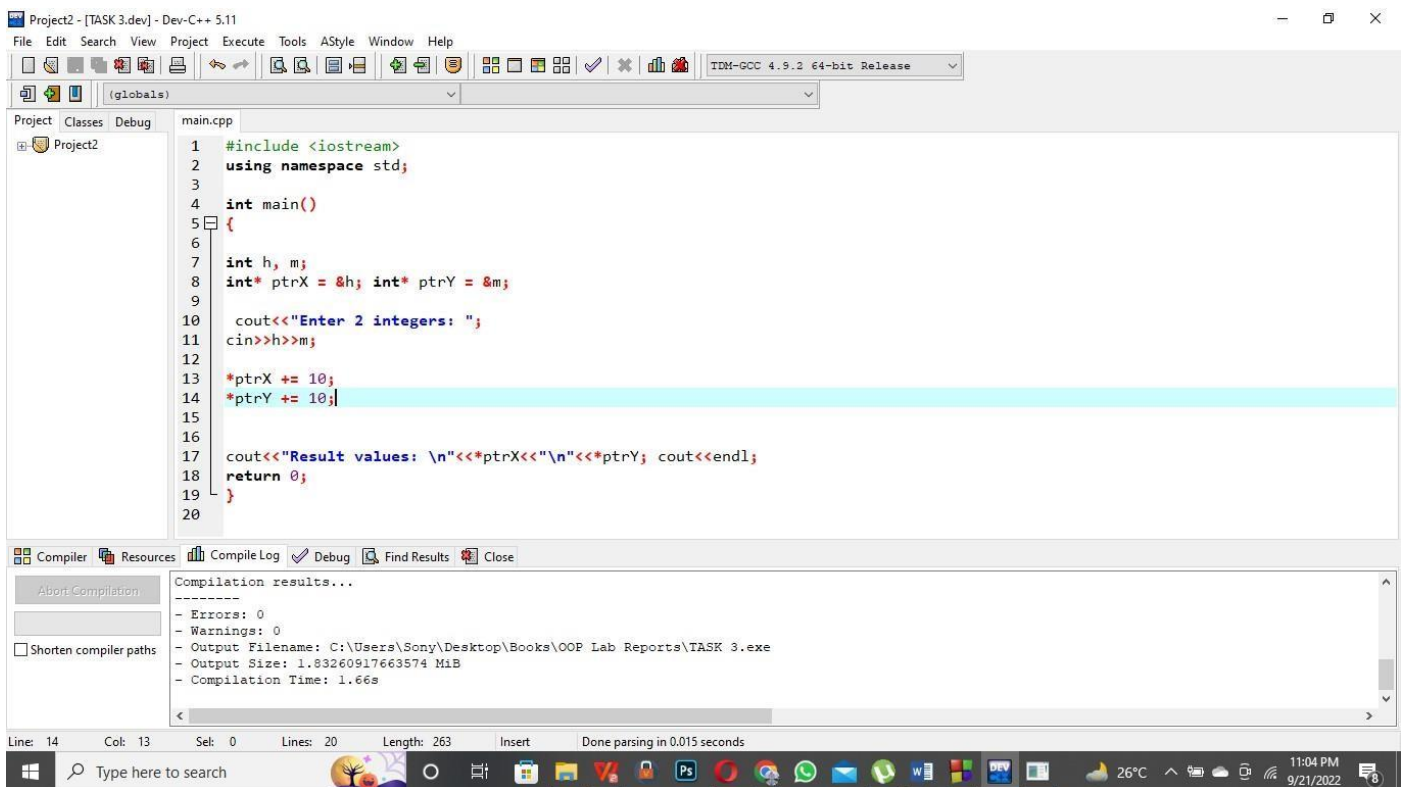
int main()
{

int h, m; int* ptrX = &h; int*
ptrY = &m;

cout<<"Enter 2 integers: ";
cin>>h>>m;

*ptrX += 10;
*ptrY += 10;

cout<<"Result values: \n"<<*ptrX<<"\n"<<*ptrY; cout<<endl; return
0;
}
```



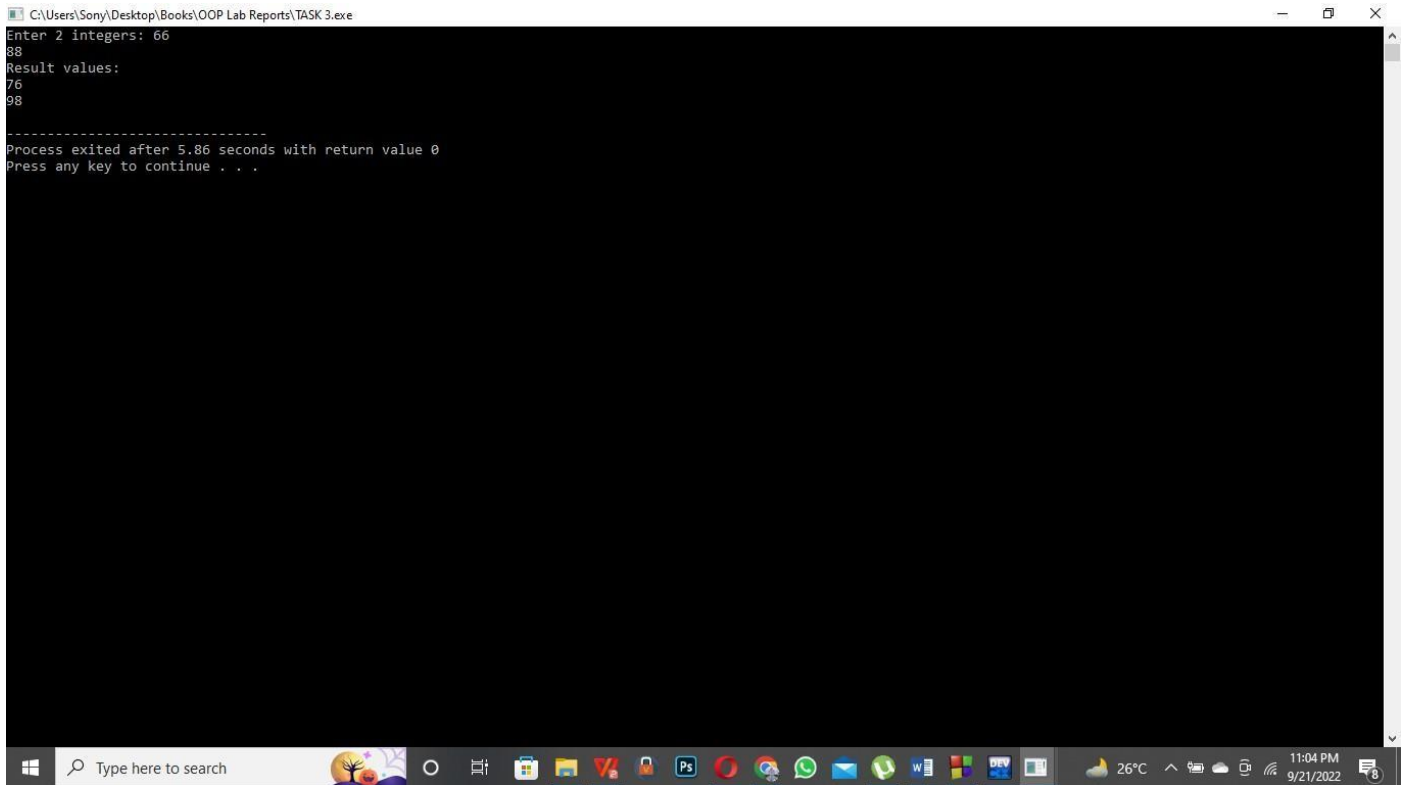
The screenshot shows a C++ IDE window titled "Project2 - [TASK 3.dev] - Dev-C++ 5.11". The code editor displays the program from the previous block. The compiler is set to "TDM-GCC 4.9.2 64-bit Release". The project explorer on the left shows "Project2" and "main.cpp". The output window at the bottom shows the compilation results:

```
Compilation results...
-----
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe
- Output Size: 1.83260917663574 MiB
- Compilation Time: 1.66s
```

The status bar at the bottom indicates "Line: 14 Col: 13 Sel: 0 Lines: 20 Length: 263 Insert Done parsing in 0.015 seconds". The Windows taskbar at the very bottom shows the date and time as "11:04 PM 9/21/2022".



## Output:



```
C:\Users\Sony\Desktop\Books\OOP Lab Reports\TASK 3.exe
Enter 2 integers: 66
88
Result values:
76
98
-----
Process exited after 5.86 seconds with return value 0
Press any key to continue . . .
```

## Home Tasks

**6.1.** There is a structure called **employee** that holds information like employee code, Name, date of joining. Write a program to create an array of the structure and enter Some data into it. Then ask the user to enter current date. Display the names of those Employees whose tenure is 3 or more than 3 years according to the given current Date.

```
#include <iostream> using
namespace std; struct
employee
{

int emp_code; string name; int
date_of_joining;
}; int current_date; int arr[5];
int
main()
{

struct employee emp[3]; for(int i=0;i<3;i++)

{
cout<<"\nEnter details for employee "<<i+1<<endl; cout<<"\nEnter employee code:"; cin>>emp[i].emp_code;
```

```

cout<<"\nEnter employee name: "; cin>>emp[i].name;
cout<<"\nEnter employee date of joining: "; cin>>emp[i].date_of_joining; cout<<"\nEnter current date: "; cin>>current_date; int
tenure=current_date-emp[i].date_of_joining; arr[i]=tenure;
} cout<<"\nNames of employees whose tenure is 3 or more than 3 years according to the given current date:\n";
for
(int i=0;i<3;i++) if
(arr[i]>=3)
cout<<emp[i].name<<endl; }

```

The screenshot shows a C++ IDE window titled "Project111 - [Project111.dev] - [Executing] - Dev-C++ 5.11". The main editor displays the source code for "main.cpp", which includes the same code as shown in the previous block. The code defines an array of 3 employee structures, prompts for their details, and prints the names of those with a tenure of 3 or more years. The bottom panel shows the "Compilation results..." window, indicating that the program compiled successfully with 0 errors and 0 warnings. The output filename is "C:\Users\Sony\Desktop\Books\OOP Lab Reports\Project111.exe", the output size is 1.833559899292 MiB, and the compilation time is 0.98s.

```

1 #include <iostream>
2 using namespace std;
3 struct employee
4 {
5
6     int emp_code; string name;
7     int date_of_joining;
8 };
9 int current_date; int arr[5];
10 int main()
11 {
12
13     struct employee emp[3]; for(int i=0;i<3;i++)
14     {
15
16         cout<<"\nEnter details for employee "<<i+1<<endl; cout<<"\nEnter employee code: "; cin>>emp[i].emp_code;
17         cout<<"\nEnter employee name: "; cin>>emp[i].name;
18         cout<<"\nEnter employee date of joining: "; cin>>emp[i].date_of_joining; cout<<"\nEnter current date: "; cin>>current_date;
19         int tenure=current_date-emp[i].date_of_joining; arr[i]=tenure;
20     }
21     cout<<"\nNames of employees whose tenure is 3 or more than 3 years according to the given current date:\n";
22     for (int i=0;i<3;i++)
23         if (arr[i]>=3)
24             cout<<emp[i].name<<endl;
25
26 }

```

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\Books\OOP Lab Reports\Project111.exe
- Output Size: 1.833559899292 MiB
- Compilation Time: 0.98s

## Output:

```
C:\Users\Sony\Desktop\Books\OOP Lab Reports\Project111.exe
Enter current date: 21092022
Enter details for employee 2
Enter employee code:88
Enter employee name:Akram
Enter employee date of joining:11092019
Enter current date: 21092022
Enter details for employee 3
Enter employee code:77
Enter employee name:Amir
Enter employee date of joining:11092017
Enter current date: 21092022
Names of employees whose tenure is 3 or more than 3 years according to the given current date:
Tariq
Akram
Amir
-----
Process exited after 75.76 seconds with return value 0
Press any key to continue . . .
```

**6.3.** Write a program that inputs a string value from the user and displays it in reverse Using pointer.

```
#include <iostream>

#include <string.h>

using namespace std;

int main(){

    char *str=" TowardsMoon";

    cout<<"original string::"<<str;

    cout<<endl<<"String after reverse::";

    for(int i=(strlen(str)-1);i>=0;i--){

        cout<<str[i];
```

```
}
```

```
return 0;
```

```
}
```

```
1 #include <iostream>
2 #include <string.h>
3 using namespace std;
4 int main()
5 {
6     char *str=" TowardsMoon";
7     cout<<"original string::"<<str;
8     cout<<endl<<"String after reverse::";
9     for(int i=(strlen(str)-1);i>=0;i--){
10         cout<<str[i];
11     }
12     return 0;
}
```

Line	Col	File	Message
5	14	C:\Users\Sony\Desktop\Books\OOP Lab Reports\mai...	In function 'int main()':
			[Warning] deprecated conversion from string constant to 'char*' [-Wwrite-strings]
11	12	C:\Users\Sony\Desktop\Books\OOP Lab Reports\main.c...	[Error] expected '}' at end of input
28		C:\Users\Sony\Desktop\Books\OOP Lab Reports\Makefil...	recipe for target 'main.o' failed

## Output:

```
C:\Users\Sony\Desktop\Books\OOP Lab Reports\oop lab tasks.exe
original string:: TowardsMoon
String after reverse::nooMsdrawoT
-----
Process exited after 0.03617 seconds with return value 0
Press any key to continue . . .
```

## 6.2. Write a function to sort data (in increasing order) in an array using 1. pass by value

```
#include<iostream>

using namespace std;

void calling(int b[],int n);
```

```

int main()
{
    int size;
    cout<<"enter size:"<<endl;
    cin>>size;
    int A[size];
    for(int i=0;i<size;i++)

    {
        cin>>A[i];
    }
    calling(A,size);
}

void calling(int b[],int n)
{
    int temp;
    for(int y=0;y<n;y++)

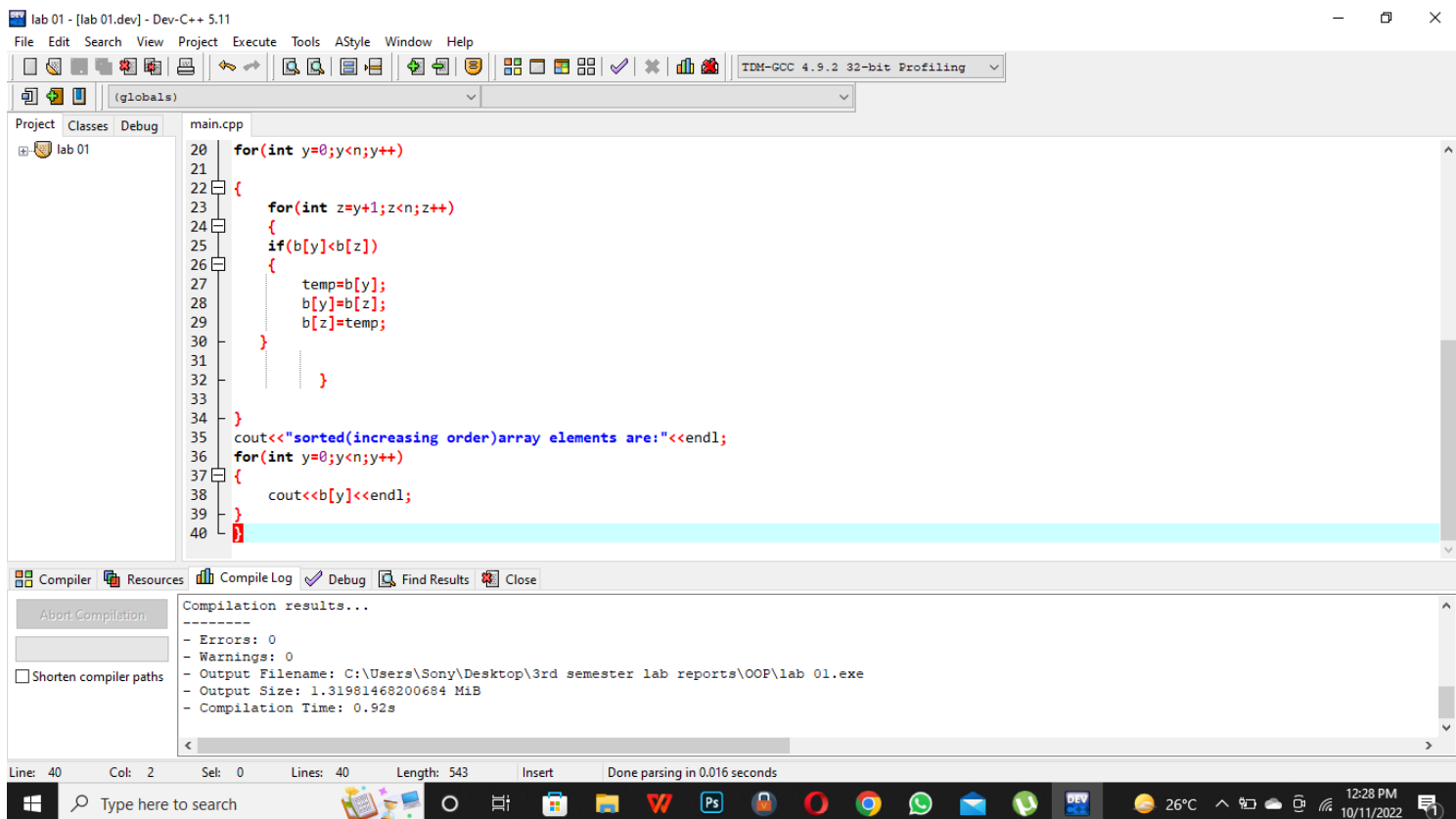
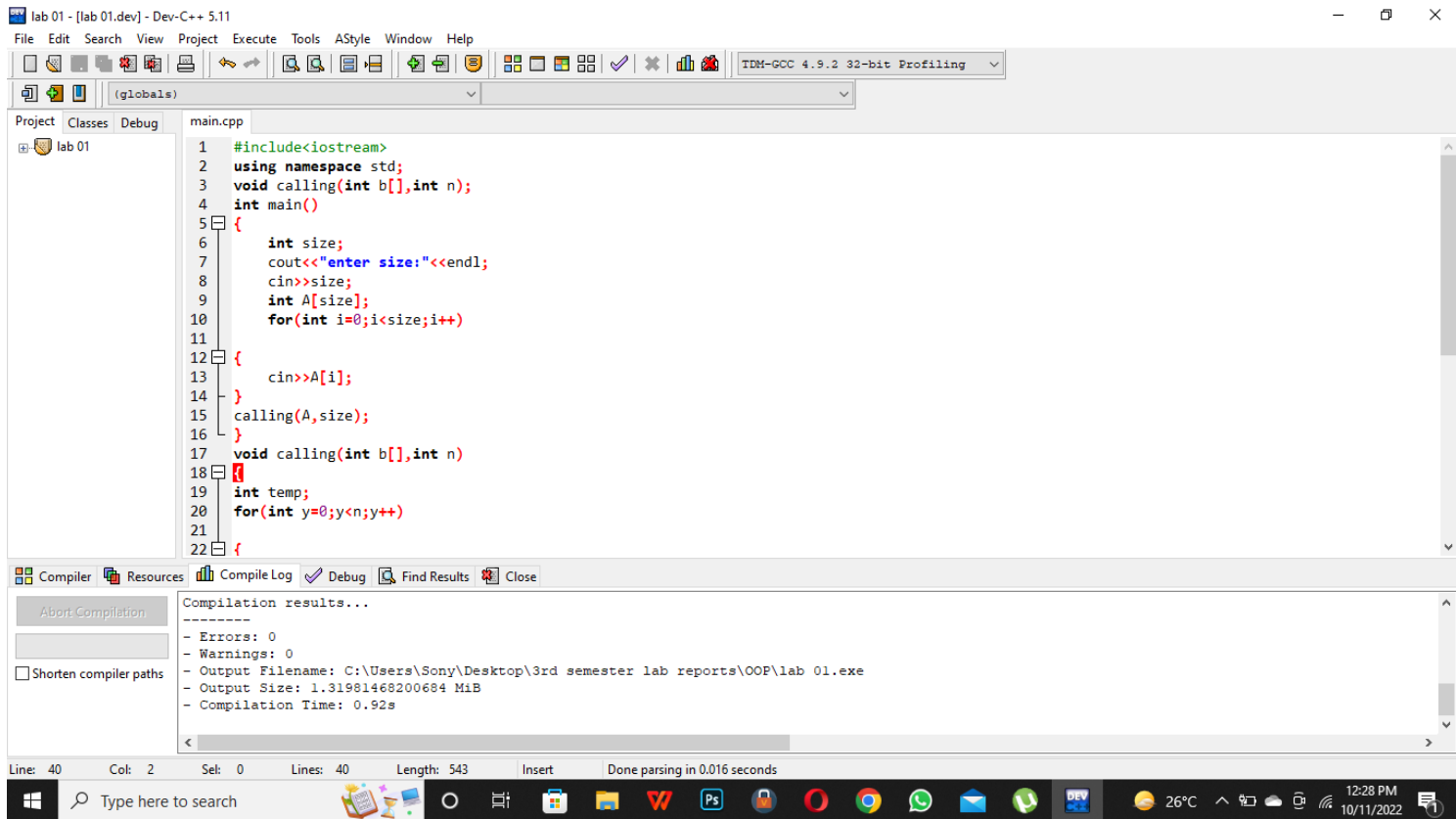
    {
        for(int z=y+1;z<n;z++)
        {
            if(b[y]<b[z])
            {
                temp=b[y];
                b[y]=b[z];
                b[z]=temp;
            }

        }

    }

    cout<<"sorted(increasing order)array elements are:"<<endl;
    for(int y=0;y<n;y++)
    {
        cout<<b[y]<<endl;
    }
}
.

```



## Output:

```
C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 01.exe
enter size:
3
3
2
1
sorted(increasing order)array elements are:
3
2
1
-----
Process exited after 10.82 seconds with return value 0
Press any key to continue . . .
```

## 2. Pass by Reference

```
#include<iostream>
using namespace std;
void calling(int *b[],int n);
int main()
{
    int size;
    cout<<"enter size:"<<endl;
    cin>>size;
    int A[size];
    for(int i=0;i<size;i++)

{
    cin>>A[i];
}
calling(&A,size);
}
void calling(int *b[],int n)
{
    int temp;
    for(int y=0;y<n;y++)

{
    for(int z=y+1;z<n;z++)
    {
```



```

        if(b[y]<*b[z])
        {
temp=*b[y];
        *b[y]=*b[z];
        *b[z]=temp;
    }

    }

}

cout<<"sorted(increasing order)array elements are:"<<endl;
for(int y=0;y<n;y++)
{
    cout<<*b[y]<<endl;
}
}

```

lab 01 - [lab 01.dev] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug

lab 01

```

1  #include<iostream>
2  using namespace std;
3  void calling(int *b[],int n);
4  int main()
5  {
6      int size;
7      cout<<"enter size:"<<endl;
8      cin>>size;
9      int A[size];
10     for(int i=0;i<size;i++)
11     {
12         cin>>A[i];
13     }
14     calling(&A,size);
15 }
16 void calling(int *b[],int n)
17 {
18     int temp;
19     for(int y=0;y<n;y++)
20     {
21     }
22 }

```

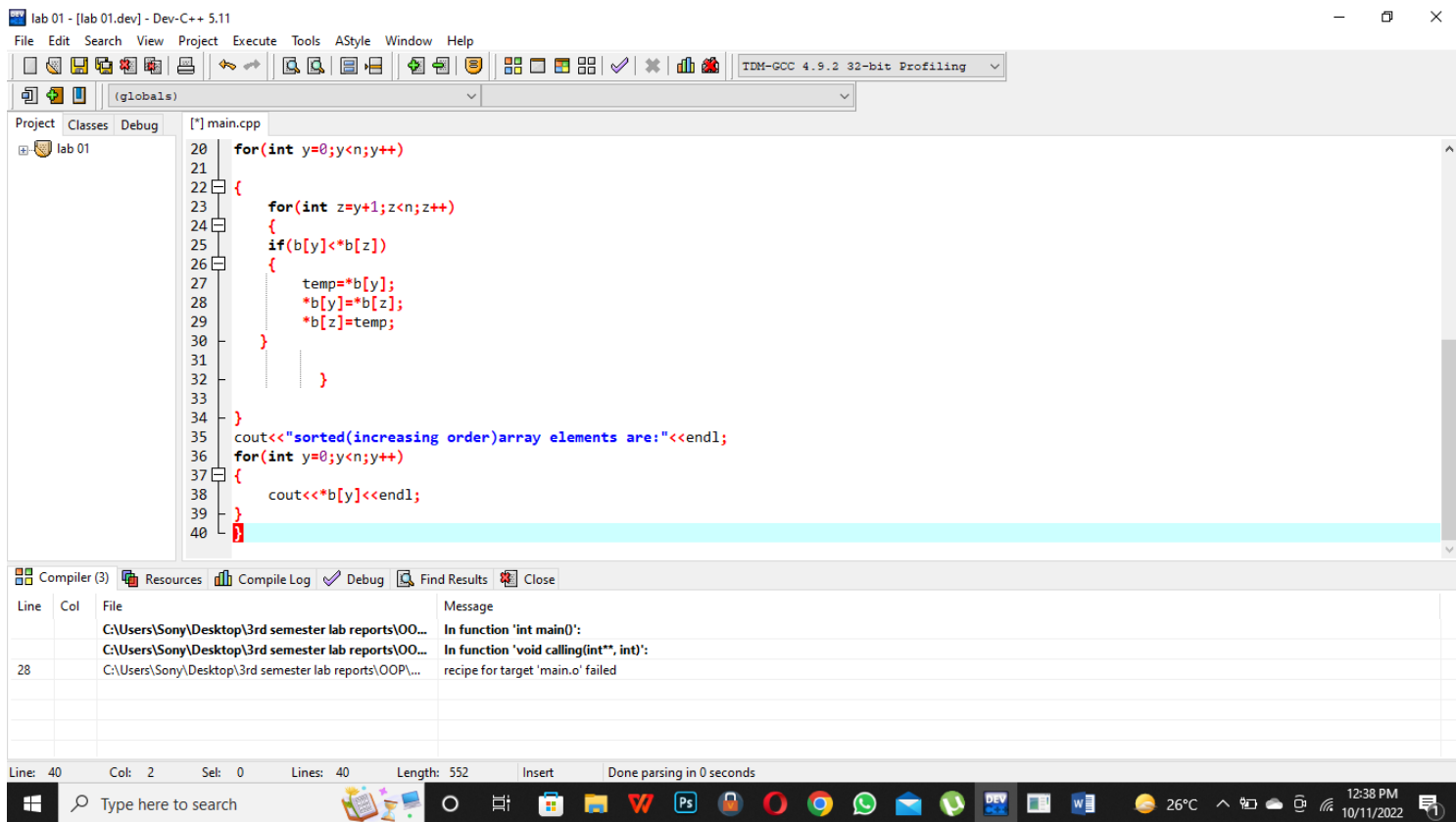
Compiler (3) Resources Compile Log Debug Find Results Close

Line	Col	File	Message
		C:\Users\Sony\Desktop\3rd semester lab reports\OO...	In function 'int main()':
		C:\Users\Sony\Desktop\3rd semester lab reports\OO...	In function 'void calling(int**, int)':
28		C:\Users\Sony\Desktop\3rd semester lab reports\OOP\...	recipe for target 'main.o' failed

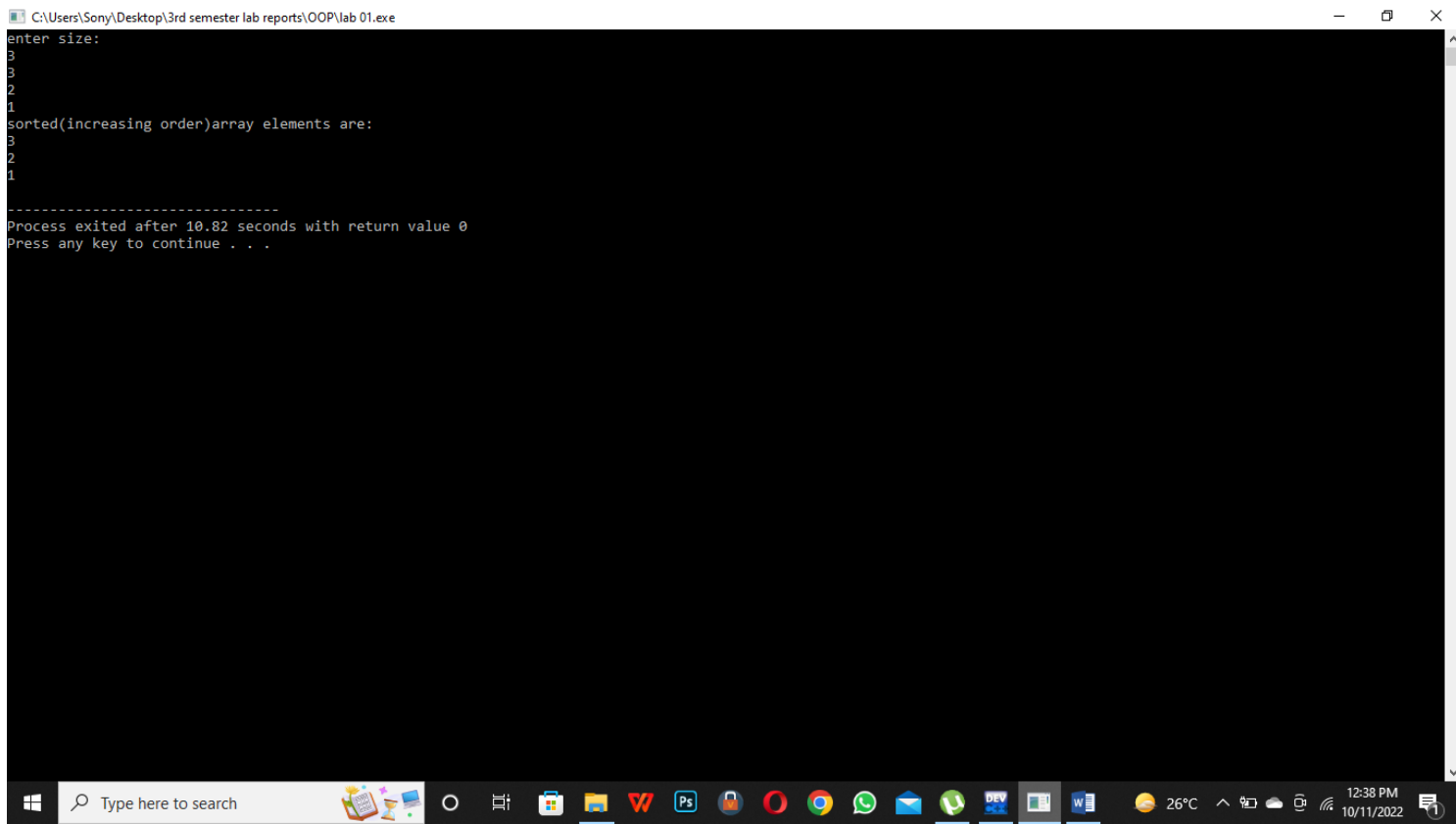
Line: 40 Col: 2 Sel: 0 Lines: 40 Length: 552 Insert Done parsing in 0 seconds

Type here to search

26°C 12:38 PM 10/11/2022



## Output:



### **Critical Analysis:**

In this lab we learned c ++ syntax and we learn how to call function in c ++ and how

To call function by value and by reference. We have done swapping of two numbers.

Moreover we learned how to make and declare structure with its structure tag and attributes

In c ++ and we learned the program how to take string values from user and displays it in

Reverse using pointer.