



**Data Structures and Algorithms-
Lab
Assignment No 1**

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A

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Program No 1:

```
#include <iostream>

using namespace std;

void change(int *n1, int *n2) {

    int temp;

    temp = *n1;

    *n1 = *n2;

    *n2 = temp;

}

int main() {

    int num1, num2;

    cout<<"Enter the first number : ";

    cin>>num1;

    cout<<"\nEnter the Second number : ";

    cin>>num2;

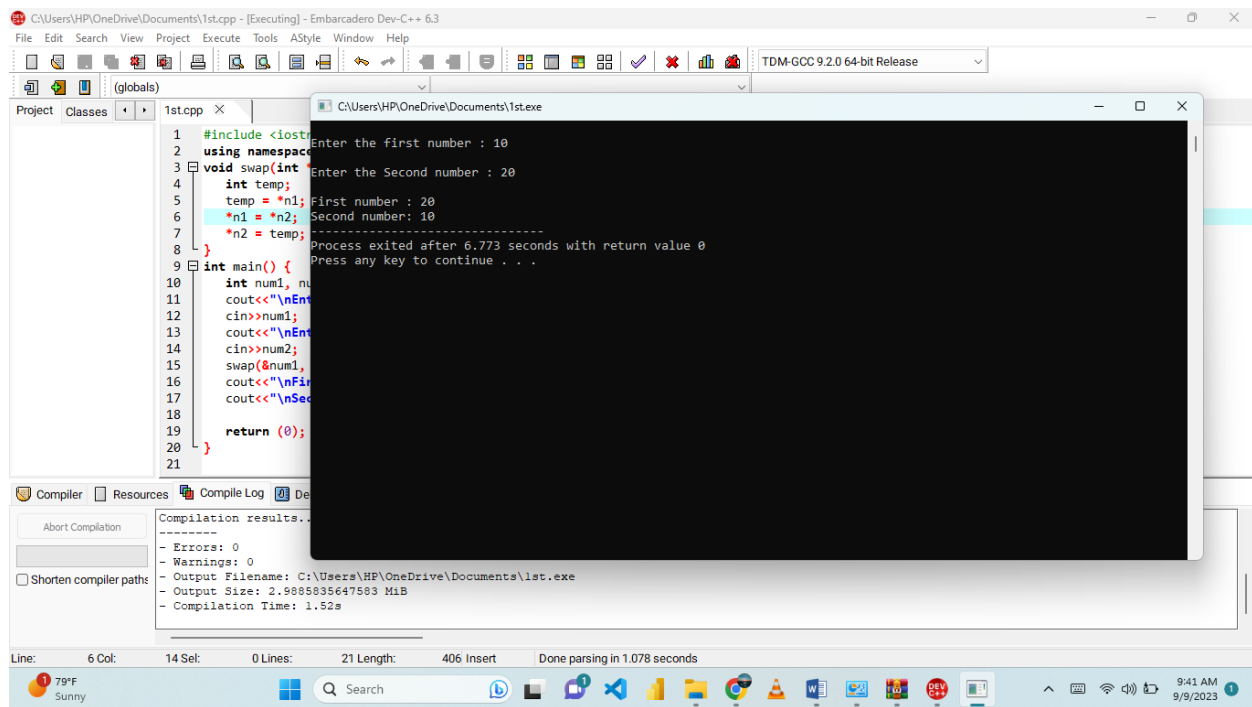
    change(&num1, &num2);

    cout<<"\nFirst number : "<< num1;

    cout<<"\nSecond number: "<<num2;

    return (0);

}
```



Program No 2:

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int ar[5], i, sum = 0;
```

```
    int *ptr;
```

```
    cout << "Enter any 5 numbers :";
```

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

```
        cin >> ar[i];
```

```
    }
```

```
    ptr = ar;
```

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

```

        sum = sum + *(ptr + i);

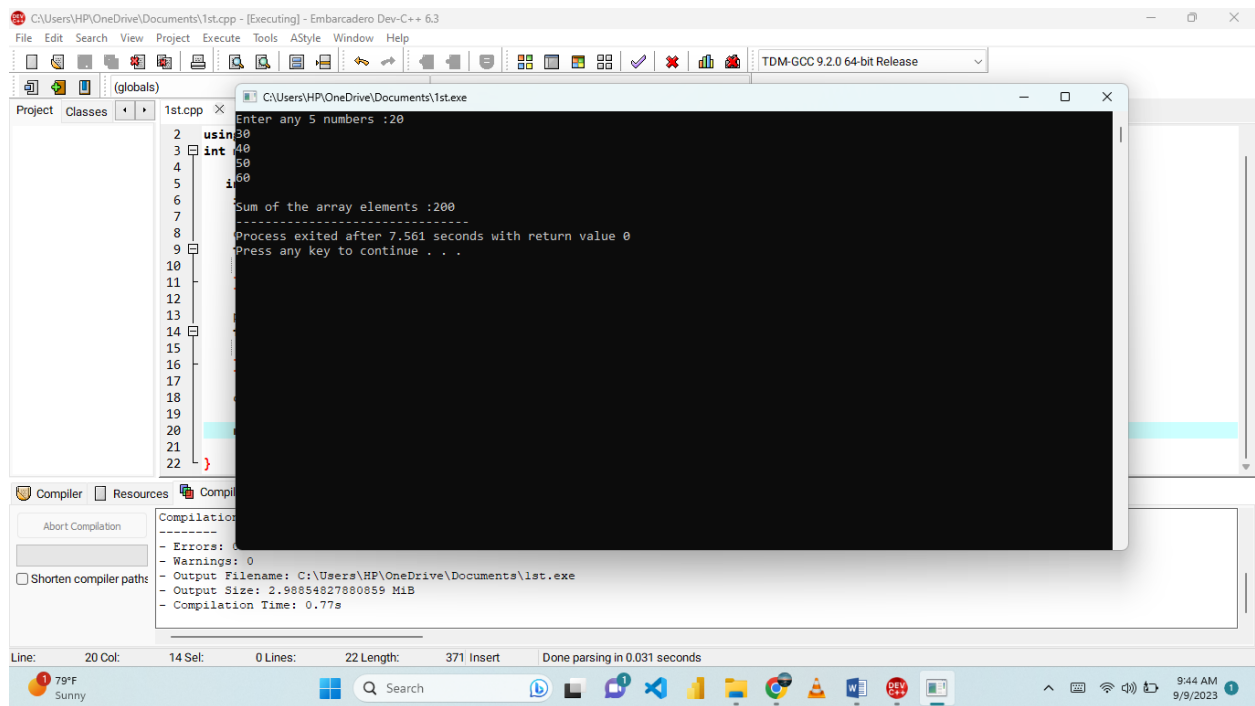
    }

    cout << "\nSum of the array elements : " << sum;

    return 0;

}

```



Program No 3:

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int arr[5],i;
```

```

int *p=arr;

cout<<"Enter five numbers :";

cin>>*p>>*(p+1)>>*(p+2)>>*(p+3)>>*(p+4);

cout<<"Numer in reverse order are:\n";

for(i=4;i>=0;i--)

    cout<<*(p+i)<<endl;

return 0;

}

```

The screenshot shows an IDE window titled "C:\Users\HP\OneDrive\Documents\1st.cpp - [Executing] - Embarcadero Dev-C++ 6.3". The main window displays the source code of a C++ program. A smaller window titled "C:\Users\HP\OneDrive\Documents\1st.exe" shows the program's output. The output prompts the user to "Enter five numbers :", and the user has entered the numbers 54, 76, 98, 45, and 2. The program then displays "Numer in reverse order are:" followed by the numbers 45, 98, 76, 54, and 2. The IDE also shows a status bar at the bottom with the text "Line: 17 Col: 2 Sel: 0 Lines: 17 Length: 306 Insert Done parsing in 0.016 seconds".

```

C:\Users\HP\OneDrive\Documents\1st.cpp - [Executing] - Embarcadero Dev-C++ 6.3
File Edit Search View Project Execute Tools AStyle Window Help
C:\Users\HP\OneDrive\Documents\1st.exe
Enter five numbers :2
54
76
98
45
2
Numer in reverse order are:
45
98
76
54
2
-----
Process exited after 5.22 seconds with return value 0
Press any key to continue . . .
-----
Errors: 0
Warnings: 0
Output Filename: C:\Users\HP\OneDrive\Documents\1st.exe
Output Size: 2.98873424530029 MiB
Compilation Time: 0.75s
Line: 17 Col: 2 Sel: 0 Lines: 17 Length: 306 Insert Done parsing in 0.016 seconds
79°F Sunny
9:47 AM 9/9/2023

```

Program No 4:

```
#include <iostream>
```

```
#include<conio.h>

using namespace std;

void circlearea(float *v, float *r) {

    *r = 3.14 * (*v) * (*v);

}


int main() {

    float radius, area;

    cout << "Enter the radius of Circle : ";

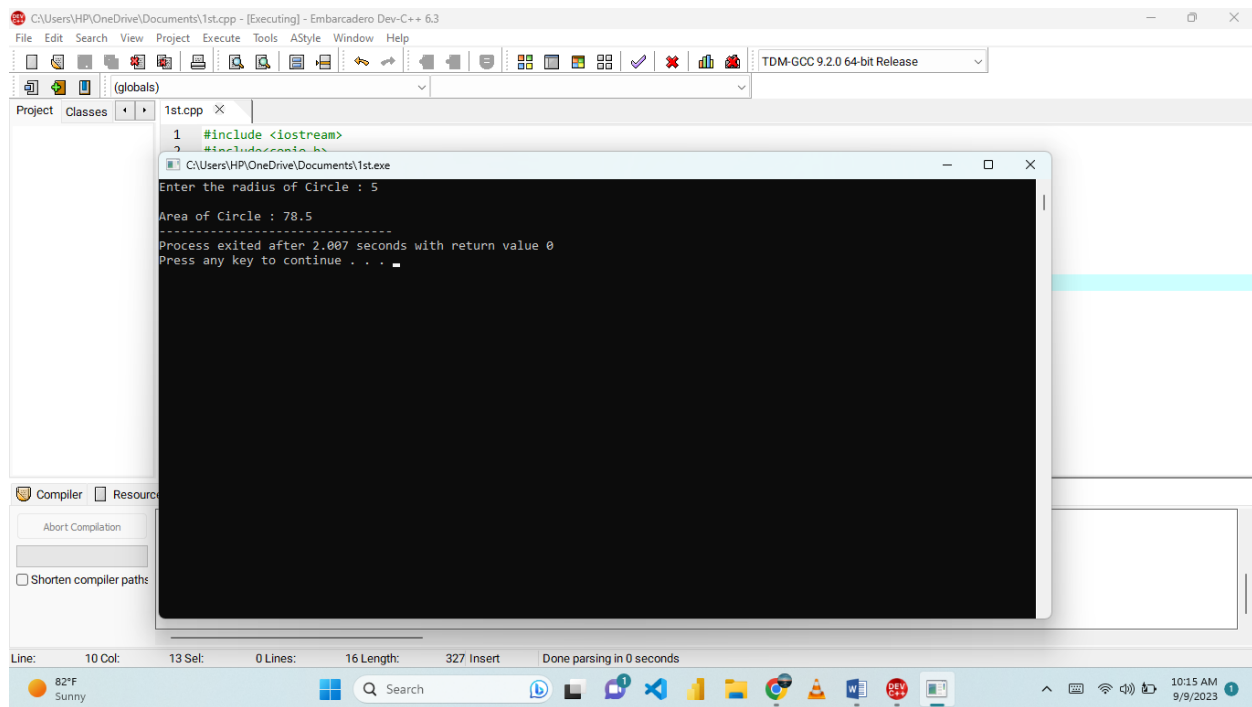
    cin>>radius;

    circlearea(&radius, &area);

    cout << "\nArea of Circle : " << area;

    return 0;

}
```



Program No 5:

```
#include <iostream>
```

```
#include<conio.h>
```

```
using namespace std;
```

```
int main() {
```

```
    char str[20], *pt;
```

```
    int i = 0;
```

```
    cout << "Calculate Length of String \n";
```

```
    cout << "Enter Any string [below 20 chars] : ";
```

```
    cin>>str;
```

```
    pt = str;
```

```

while (*pt != '\0') {

    i++;

    pt++;

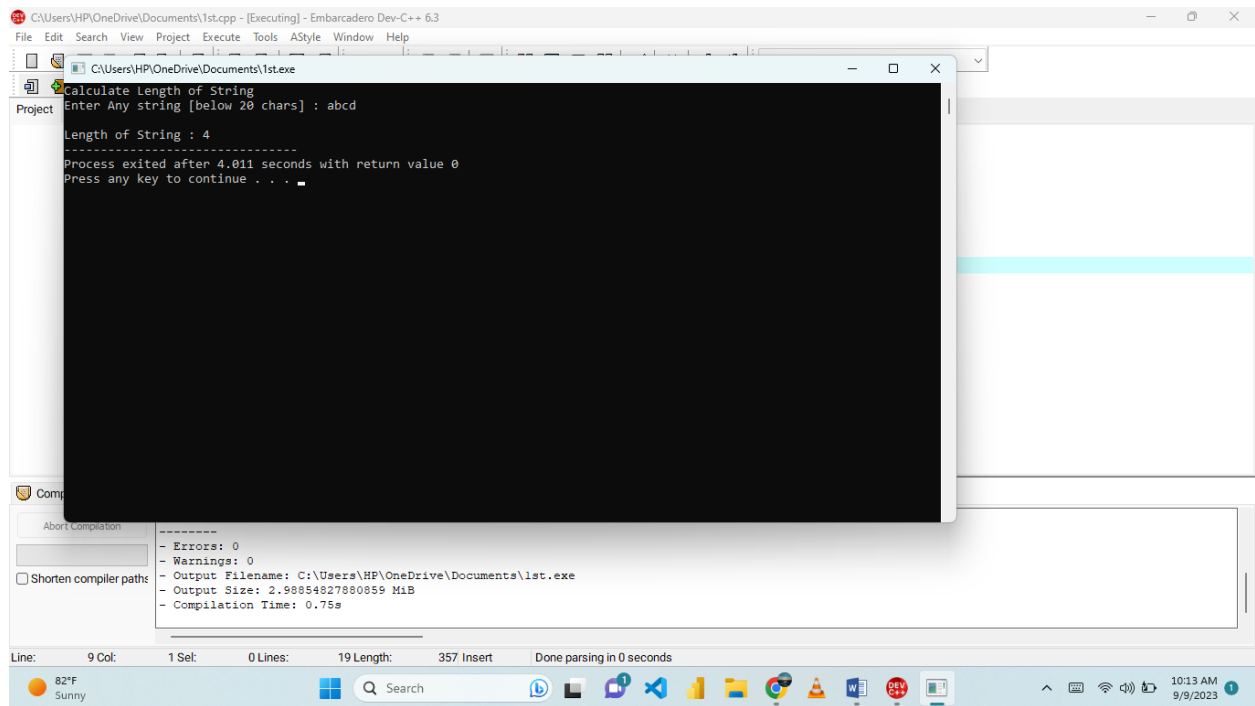
}

cout << "\nLength of String : " << i;

return 0;

}

```



Program No 6:

```

#include <iostream>

#include<conio.h>

using namespace std;

int main() {

    char str[20], *pt;

```



```

int i = 0, c = 0;

cout << " Program to Count vowels in String \n";

cout << "Enter Any string [below 20 chars] : ";

cin>>str;

pt = str;

while (*pt != '\0') {

    if (*pt == 'a' || *pt == 'e' || *pt == 'i' || *pt == 'o' || *pt == 'u' || *pt == 'A' || *pt == 'E' || *pt == 'I' ||
*pt == 'O' || *pt == 'U')

        c++;

    i++;

    pt++;

}

cout << "\nLength of String : " << i;

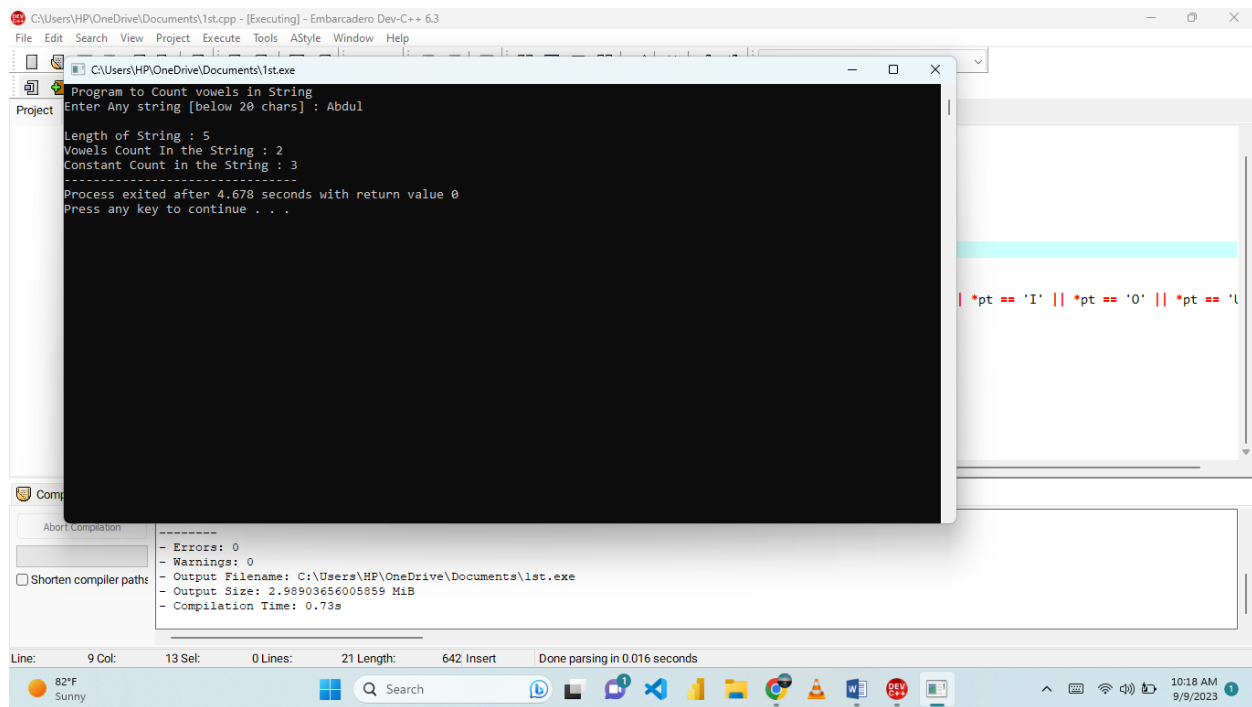
cout << "\nVowels Count In the String : " << c;

cout << "\nConstant Count in the String : " << (i - c);

return 0;

}

```



Program No 7:

```
#include <iostream>
```

```
#include<conio.h>
```

```
using namespace std;
```

```
int main() {
```

```
    char str[30], *pt;
```

```
    cout << "Enter Any string [below 30 chars] : ";
```

```
    cin>>str;
```

```
    pt = str;
```

```
    while (*pt != '\0') {
```

```

    cout << *pt;

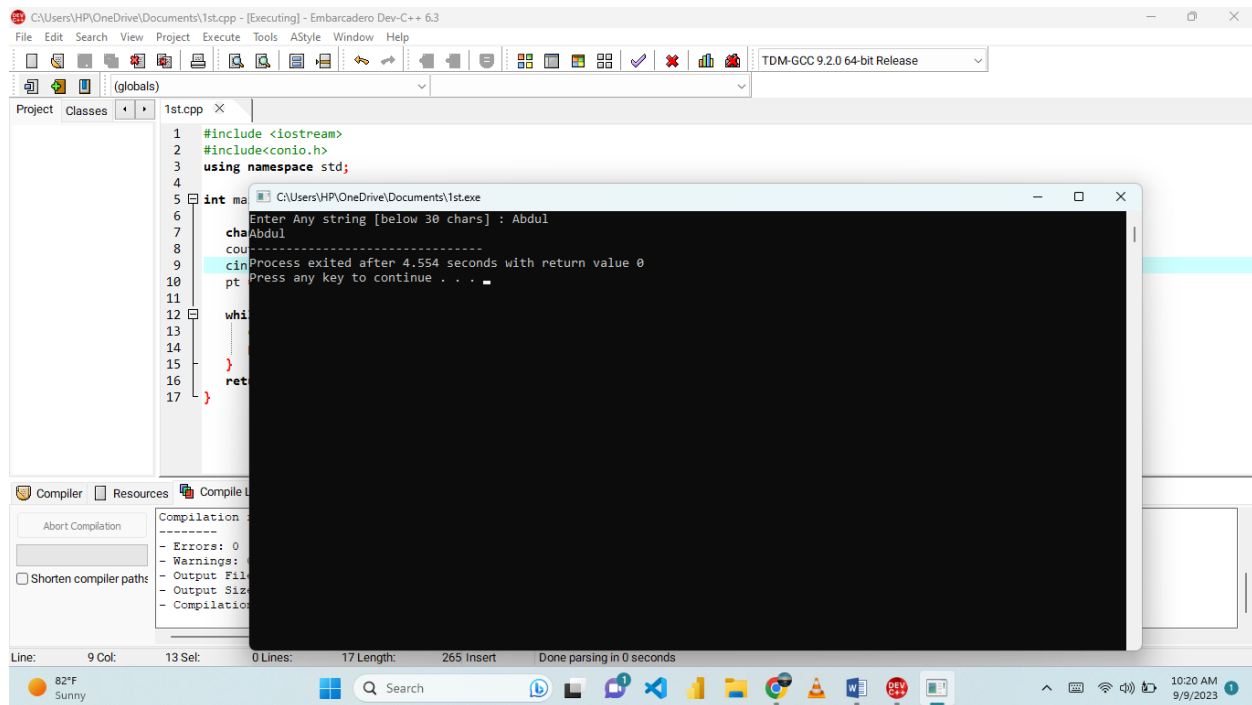
    pt++;

}

return 0;

}

```



Program no 8:

```
#include <iostream>
```

```
#include<conio.h>
```

```
using namespace std;
```

```
int main() {
```

```
    int *p1, *p2;
```

```
    int num1, num2, d;
```

```
    cout << "\nEnter Two Numbers for Find a Difference : \n";
```

```

cin>>num1;

cin>>num2;

p1 = &num1;

p2 = &num2;

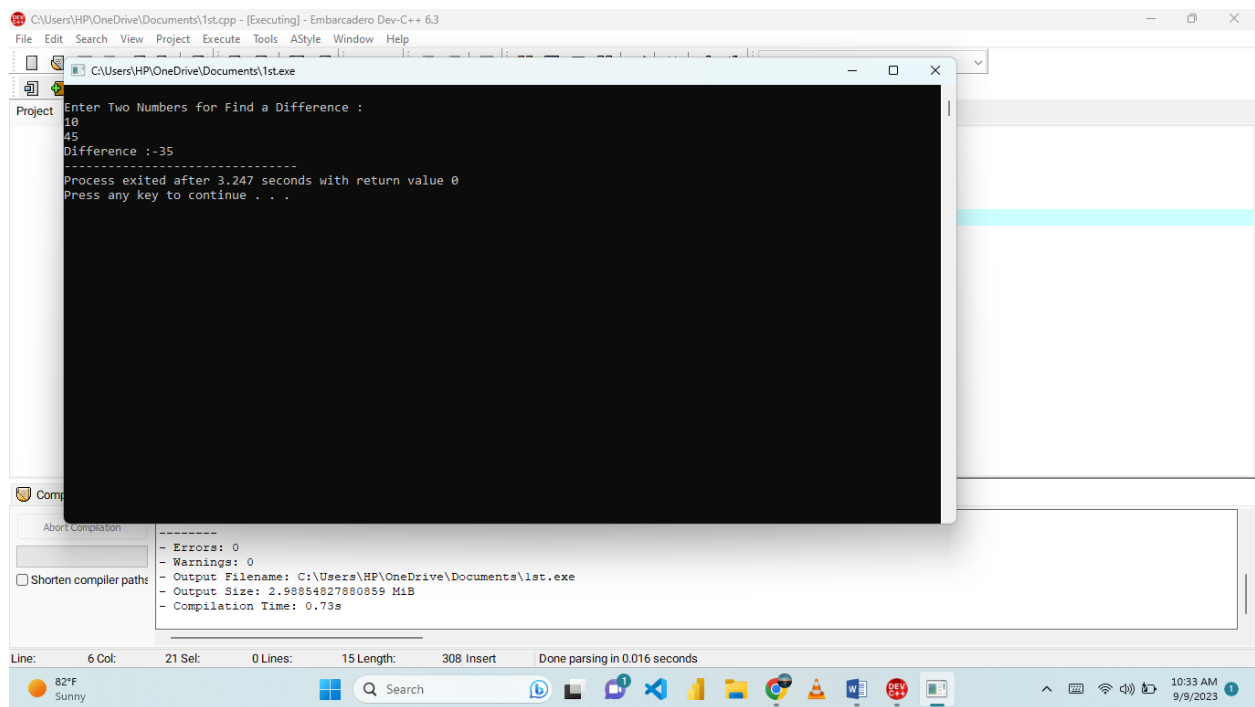
d = *p1 - *p2;

cout << "Difference : " << d;

return 0;

}

```



Program No 9:

```

#include <iostream>

#include<conio.h>

using namespace std;

int main() {

```

```
int a;

int *ptrr;

a = 10;

ptrr = &a;

(*ptrr)++;

cout << "Increment Value of A = " << a;

++(*ptrr);

cout << "\nIncrement Value of A = " << a;

(*ptrr)--;

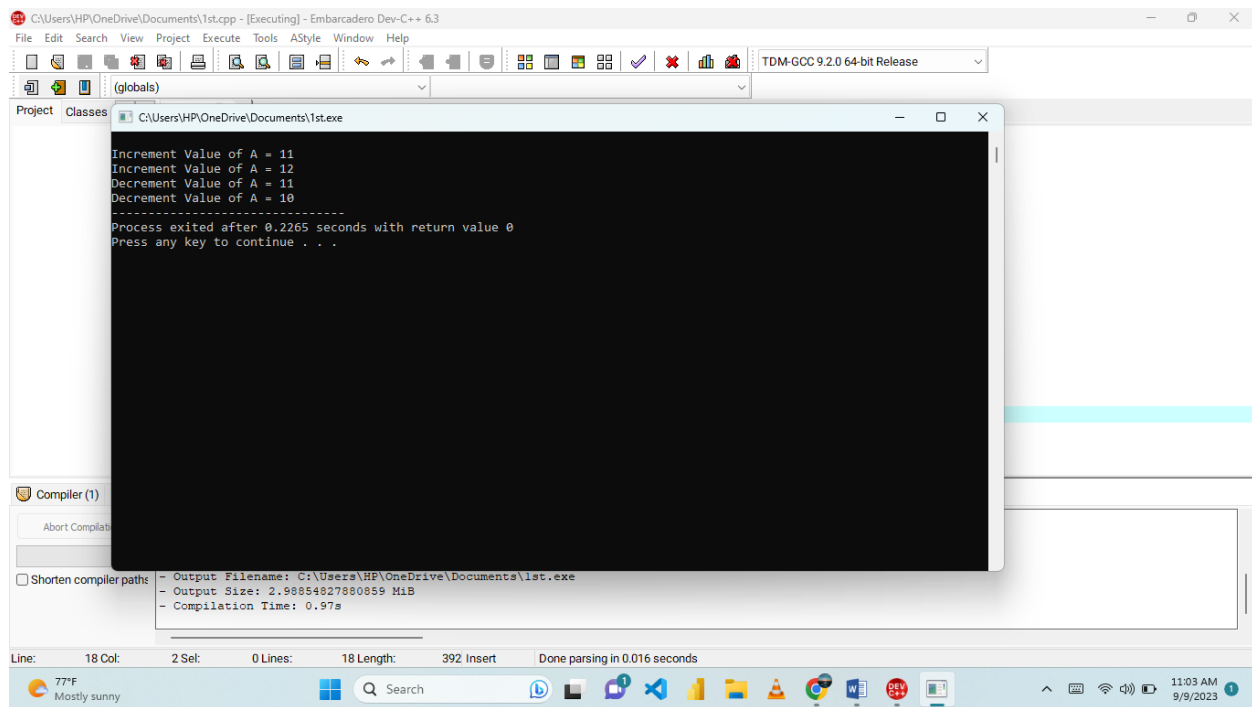
cout << "\nDecrement Value of A = " << a;

--(*ptrr);

cout << "\nDecrement Value of A = " << a;

return 0;

}
```



Program No 10:

```
#include <iostream>
```

```
#include<conio.h>
```

```
using namespace std;
```

```
int main() {
```

```
    int a = 20;
```

```
    int *pa = &a;
```

```
    char b = 'x';
```

```
    char *pb = &b;
```

```
    float c = 20.02;
```

```
    float *pc = &c;
```

```
    double d = 20.01;
```

```
    double *pd = &d;
```

```
long e = 20.02;

long *pe = &e;

cout << "sizeof(a): = " << sizeof (a);

cout << "\nsizeof(*pa) : = " << sizeof (*pa);


cout << "\nsizeof(b) : = " << sizeof (b);

cout << "\nsizeof(*pb): = " << sizeof (*pb);


cout << "\nsizeof(c) : = " << sizeof (c);

cout << "\nsizeof(*pc) : = " << sizeof (*pc);


cout << "\nsizeof(d): = " << sizeof (d);

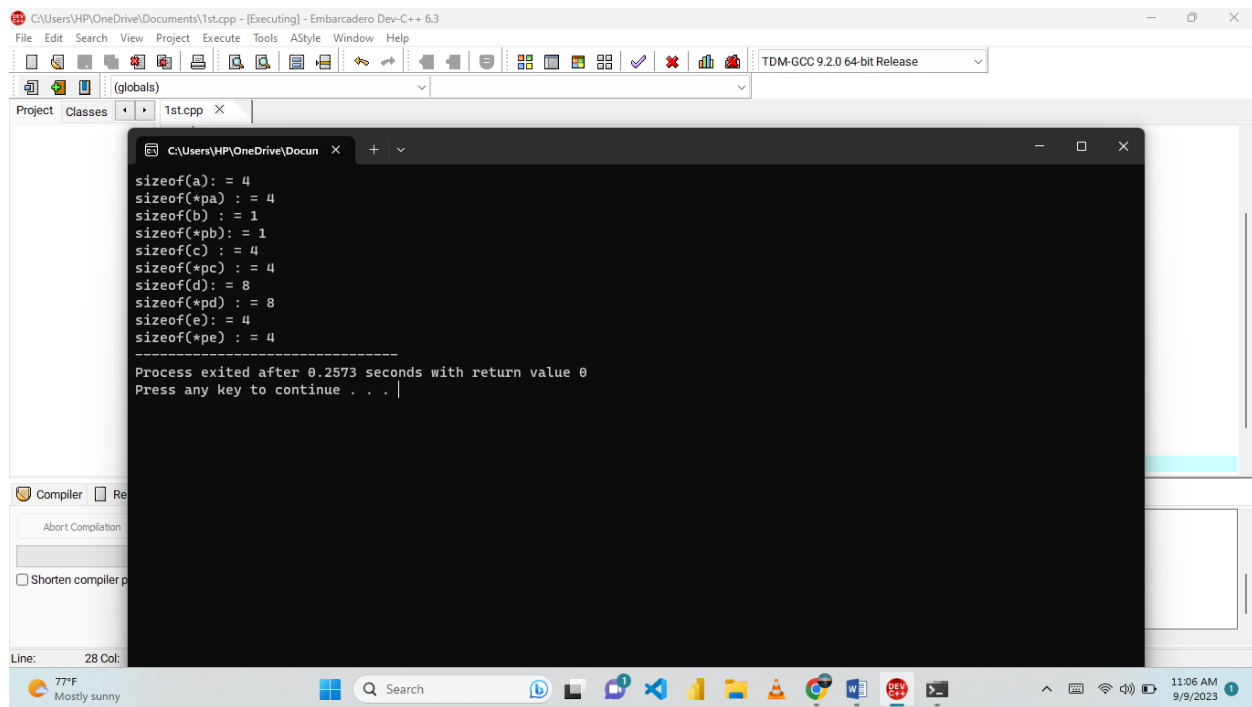
cout << "\nsizeof(*pd) : = " << sizeof (*pd);


cout << "\nsizeof(e): = " << sizeof (e);

cout << "\nsizeof(*pe) : = " << sizeof (*pe);


return 0;

}
```



Program no 11:

```
#include <iostream>
```

```
#include<conio.h>
```

```
using namespace std;
```

```
int main() {
```

```
    int a;
```

```
    int *pt;
```

```
    a = 560;
```

```
    pt = &a;
```

```
    cout << "a:Value of A = " << a;
```



```

cout << "\n*pt: Value of A = " << *pt;

cout << "\n&a :Address of A = " << &a;

cout << "\npt:Address of A = " << pt;

cout << "\n&pt:Address of pt = " << &pt;

cout << "\npt: Value of pt = " << pt;

return 0;

}

```

```

C:\Users\HP\OneDrive\Documents\1st.cpp - [Executing] - Embarcadero Dev-C++ 6.3
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 9.2.0 64-bit Release
C:\Users\HP\OneDrive\Docu...
a:Value of A = 560
*pt:Value of A = 560
&a :Address of A = 0x78fe1c
pt:Address of A = 0x78fe1c
&pt:Address of pt = 0x78fe10
pt:Value of pt = 0x78fe1c
-----
Process exited after 0.2601 seconds with return value 0
Press any key to continue . . .

```

Program No 12:

```

#include <iostream>

#include<conio.h>

using namespace std;

int main() {

    float a;

```

```

float *pt;

a = 564.01;

pt = &a;

(*pt)++;

cout << "Increment Value of A = " << a;

++(*pt);

cout << "Increment Value of A = " << a;

(*pt)--;

cout << "Decrement Value of A = " << a;

--(*pt);

cout << "Decrement Value of A = " << a;

return 0;

}

```

The screenshot shows a C++ IDE window titled "C:\Users\HP\OneDrive\Documents\Untitled1.cpp - [Executing] - Embarcadero Dev-C++ 6.3". The IDE has a menu bar (File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help) and a toolbar. The main editor area displays the C++ code from the previous block. Below the editor, there is a "Compiler" tab with an "Abort Compilation" button and a checkbox for "Shorten compiler path". A black console window is overlaid on the IDE, showing the output of the program:

```

increment decrement using floating point
Increment Value of A = 565.01
Increment Value of A = 566.01
Decrement Value of A = 565.01
Decrement Value of A = 564.01
-----
Process exited after 0.1342 seconds with return value 0
Press any key to continue . . .

```

The Windows taskbar at the bottom shows the system clock as 12:18 PM on 9/9/2023, and the weather as 88°F Mostly sunny.

Program No 13:

```
#include <iostream>

using namespace std;

int main()
{
    int num1, num2;

    int *ptr1, *ptr2;

    int mul;

    cout << "Enter first number: ";

    cin >> num1;

    cout << "\n Enter second number: ";

    cin >> num2;

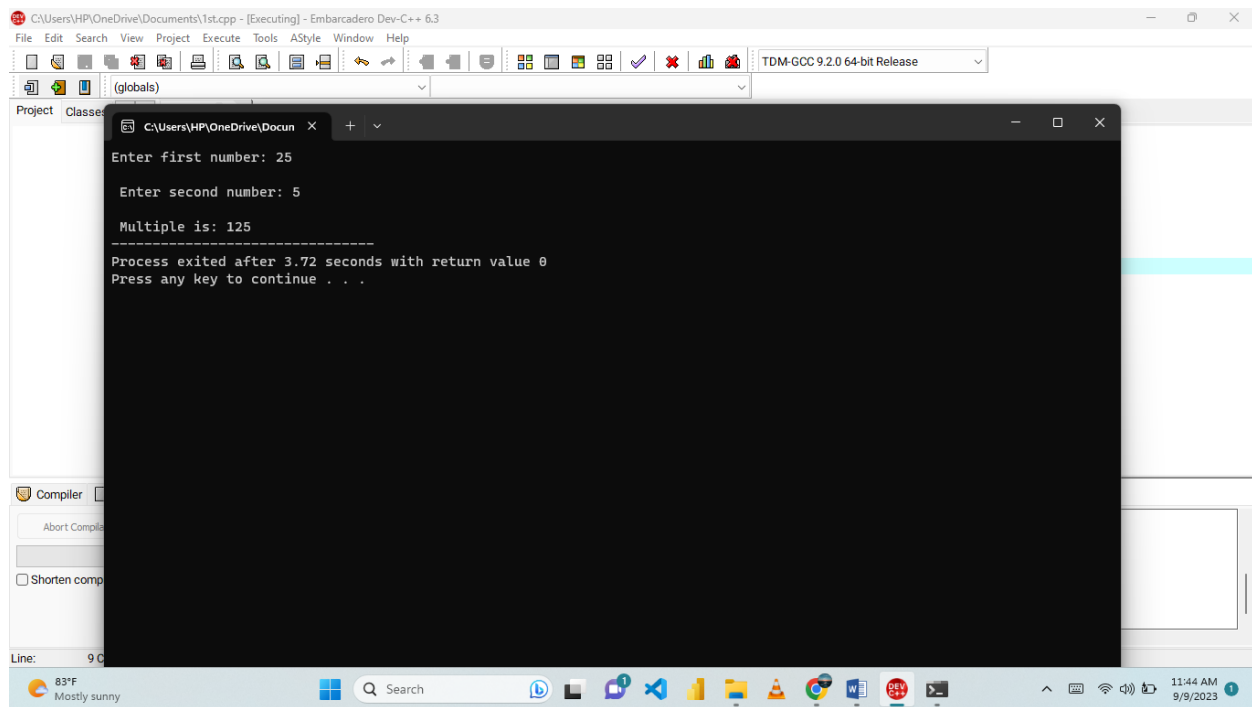
    ptr1 = &num1;

    ptr2 = &num2;

    mul = *ptr1 * *ptr2;

    cout << "\n Multiple is: " << mul;

    return 0;
}
```



Program no 14:

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    float num1, num2;
```

```
    float *ptr1, *ptr2;
```

```
    float div;
```

```
    cout << "Enter first number: ";
```

```
    cin >> num1;
```

```
    cout << "\nEnter second number: ";
```

```
    cin >> num2;
```

```
    ptr1 = &num1;
```

```

ptr2 = &num2;

if(*ptr1>*ptr2){

    div = *ptr1 / *ptr2;

    cout << "\nDivide is: " << div;

}

else{

    cout<<"Cant divide by small number";

}

return 0;

}

```

The screenshot shows the Embarcadero Dev-C++ 6.3 IDE. The main window displays the source code of a C++ program. The console window, titled 'C:\Users\HP\OneDrive\Documents\Untitled1.cpp - [Executing] - Embarcadero Dev-C++ 6.3', shows the program's execution. It prompts for 'Enter first number: 65' and 'Enter second number: 3'. The output is 'Divide is: 21.6667'. Below the output, it states 'Process exited after 1.815 seconds with return value 0' and 'Press any key to continue . . .'. The status bar at the bottom indicates 'Line: 24 Col: 1 Sel: 0 Lines: 24 Length: 442 Insert Done parsing in 0.016 seconds'. The Windows taskbar at the bottom shows the date and time as 11:56 AM on 9/9/2023.

Program No 15:

```

#include <iostream>

#include <conio.h>

using namespace std;

int main()

{

    int i,*ptr;

    ptr=&i;

    for(*ptr=0; *ptr<=1000; *ptr=*ptr+5)

    {

        cout<<*ptr<<" ";

    }

    return 0;

}

```

The screenshot shows the execution of the provided C++ code in the Embarcadero Dev-C++ 6.3 IDE. The output window displays the following text:

```

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 17
5 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 32
5 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 47
5 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 62
5 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 77
5 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 92
5 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000

Process exited after 0.1728 seconds with return value 0
Press any key to continue . . .

```

The IDE interface shows the file path 'C:\Users\HP\OneDrive\Documents\Untitled1.cpp' and the compiler 'TDM-GCC 9.2.0 64-bit Release'. The status bar at the bottom indicates 'Line: 11 Col: 6 Sel: 0 Lines: 14 Length: 205 Insert Done parsing in 0.016 seconds'.