

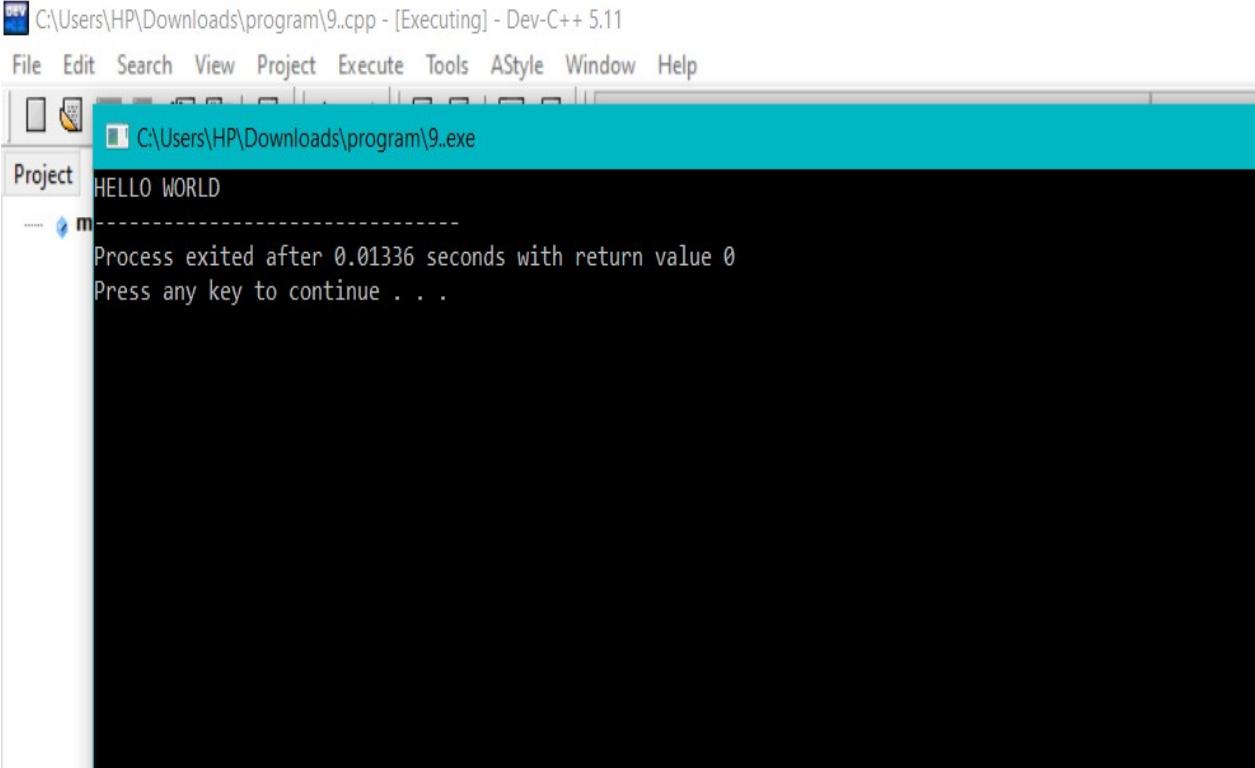
C++ ASSIGNMENT 1.1

1. Write a program to print “Hello World” on the screen.

INPUT

```
#include<iostream>
using namespace std;
int main()
{
    cout<<"HELLO WORLD";
    return 0;
}
```

OUTPUT



The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and Exit. The left sidebar has tabs for Project, Files, and Output. The Project tab is selected, showing "C:\Users\HP\Downloads\program\9.exe" and "HELLO WORLD". The main window displays the terminal output: "Process exited after 0.01336 seconds with return value 0" followed by "Press any key to continue . . ." The background of the main window is black.

2. Write a program that generate the following output

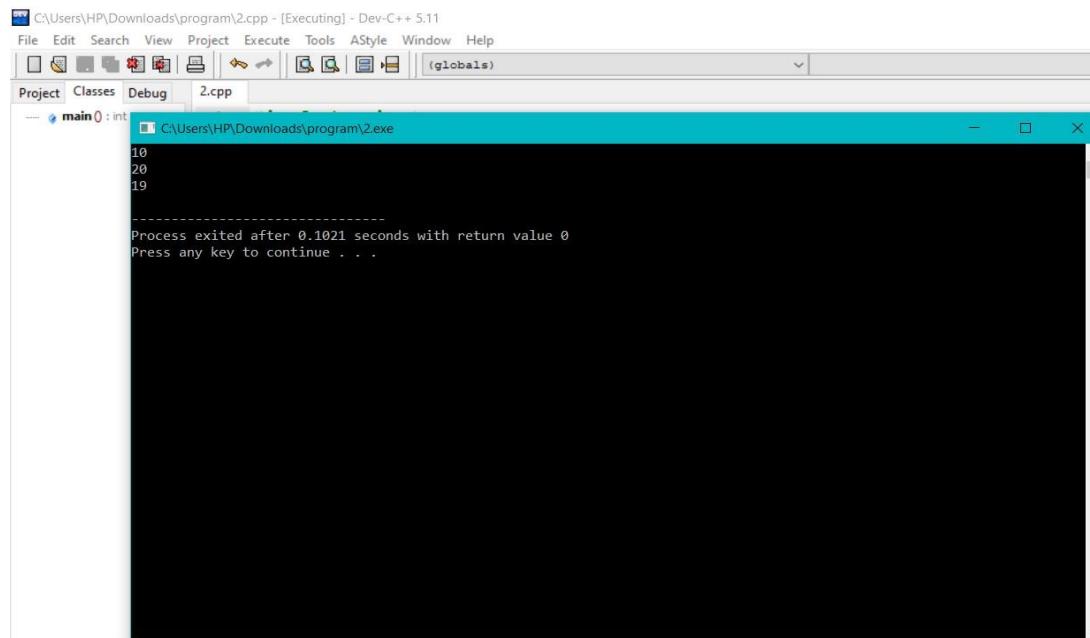
10, 20, 19

Use an integer constant for 10, an arithmetic C++ ASSIGNMENT operator to generate the 20, and a decrement operator to generate 19

Input

```
#include <iostream>
using namespace std;
int main()
{
    int a=10;
    cout << a << endl;
    a= (a*2);
    cout << a-- << endl;
    cout << a << endl;
    return 0;
}
```

Output



The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\2.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The project manager shows "main 0 : int" under the "Project" tab. The code editor shows the C++ code above. The terminal window shows the output:

```
10
20
19

Process exited after 0.1021 seconds with return value 0
Press any key to continue . . .
```

2. Write a program that asks the user to enter a radius value and then compute the volume of a sphere with the input radius.

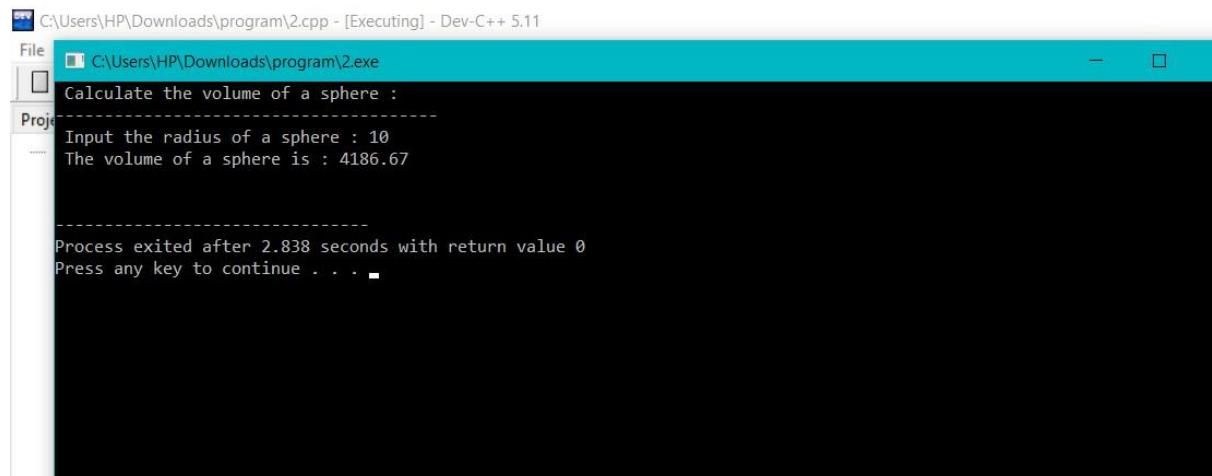
INPUT

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

int main()
{
    int rad1;
    float volsphere;

    cout << " Calculate the volume of a sphere :" << endl;
    cout << "-----\n";
    cout << " Input the radius of a sphere : ";
    cin >> rad1;
    volsphere = (4 * 3.14 * rad1 * rad1 * rad1) / 3;
    cout << " The volume of a sphere is : " << volsphere << endl;
    cout << endl;
    return 0;
}
```

OUTPUT



The screenshot shows a Dev-C++ window titled 'C:\Users\HP\Downloads\program\2.cpp - [Executing] - Dev-C++ 5.11'. The window displays the following text:

```
File C:\Users\HP\Downloads\program\2.exe
Project Project 1
Calculate the volume of a sphere :
Input the radius of a sphere : 10
The volume of a sphere is : 4186.67

Process exited after 2.838 seconds with return value 0
Press any key to continue . . .
```

3. Write a program that takes three input of sides of a triangle. The program should indicate whether the triangle would be formed or not. If it can be formed it also indicates the type.

INPUT

```
#include <iostream>
using namespace std;
int main()
{
int a1, a2, a3;

cout<< "Write the length of the side 1:";
cin >> a1;

cout<< "Write the length of the side 2:";
cin >> a2;

cout<< "write the length of the side 3:";
cin >> a3;

if (a1+a2>a3 || a2+a3>a1 || a1+a3>a2){

    cout<< "Triangle can form" << endl;
}

else {

    cout<<"Triangle cannot form" << endl;
}

if (a1 == a2 && a1 == a3)

{
    cout << "The triangle is an Equilateral triangle";
}

else if (a1==a2 && a1!=a3) {

    cout << "The triangle is an Isoceles triangle";
}

else if (a1!=a2 && a1!=a3) {
```

```

cout << "The triangle is an Scalene triangle";

}

return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\4.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 4.cpp
--- main() : int
C:\Users\HP\Downloads\program\4.exe
Write the length of the side 1:30
Write the length of the side 2:40
write the length of the side 3:60
Triangle can form
The triangle is an Scalene triangle
-----
Process exited after 4.613 seconds with return value 0
Press any key to continue . . .

```

- 4. Write a program that takes one input as number and it will display whether the number is +ve, -ve or zero. If the number is +ve, then it will display whether the number is odd or even.**

INPUT

```

#include <iostream>
using namespace std;

int main()

```

```
{  
    signed long num1 = 0;  
  
    cout << "\n\n Check whether a number is positive, negative or zero  
:\n";  
  
    cout << " Input a number : ";  
    cin >> num1;  
    if(num1 > 0)  
  
{  
  
    cout << " The entered number is positive.\n\n";  
    if (num1 % 2 == 0)  
    {  
        cout << "Given number is EVEN" << endl;  
    }  
    else  
    {  
        cout << "Given number is ODD" << endl;  
    }  
}  
else if(num1 < 0)  
{  
    cout << " The entered number is negative.\n\n";  
}  
else
```

```

{
    std::cout << " The number is zero.\n\n";
}

return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\7.cpp - [Executing] - Dev-C++ 5.11
File C:\Users\HP\Downloads\program\7.exe
Project
Check whether a number is positive, negative or zero :
Input a number : 31
The entered number is positive.

Given number is ODD

-----
Process exited after 4.939 seconds with return value 0
Press any key to continue . . .

```

5. Write a program which takes username as input and it greets to user with his name.

INPUT

```

#include <iostream>

using namespace std;

int main()
{
    string name;

    cout << "Enter the name: ";
    cin >> name;
}

```

```

cout << "Entered name is: Hello " <<
name;
return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\8.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project C:\Users\HP\Downloads\program\8.exe
Enter the name: DANISH
Entered name is:Hello DANISH
Process exited after 4.186 seconds with return value 0
Press any key to continue . . .

```

6. Write a program, which takes two integer numbers as input and it shows their exchanged value. (Don't use third variable)

INPUT

```

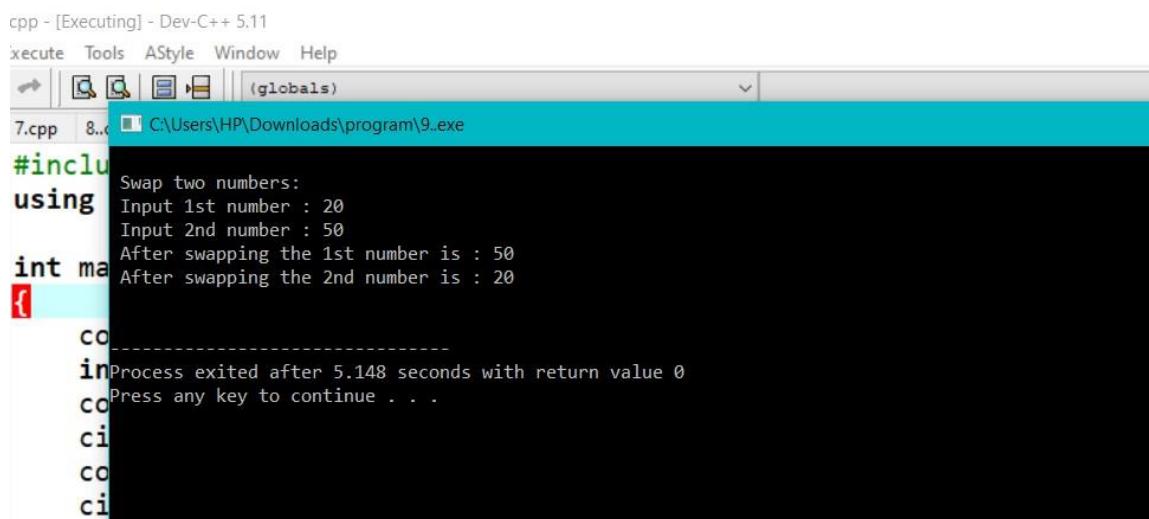
#include <iostream>
using namespace std;
int main()
{
    cout << "\n Swap two numbers:\n";
    int num1, num2, temp;
    cout << " Input 1st number : ";
    cin >> num1 ;
    cout << " Input 2nd number : ";
    cin >> num2;
    num2=num2+num1;
    num1=num2-num1;
    num2=num2-num1;

    cout << " After swapping the 1st number is : "<< num1 <<"\n" ;
    cout << " After swapping the 2nd number is : "<< num2 <<"\n\n" ;
}

```

```
    return 0;  
}
```

OUTPUT



```
Swap two numbers:  
Input 1st number : 20  
Input 2nd number : 50  
After swapping the 1st number is : 50  
After swapping the 2nd number is : 20  
Process exited after 5.148 seconds with return value 0  
Press any key to continue . . .
```

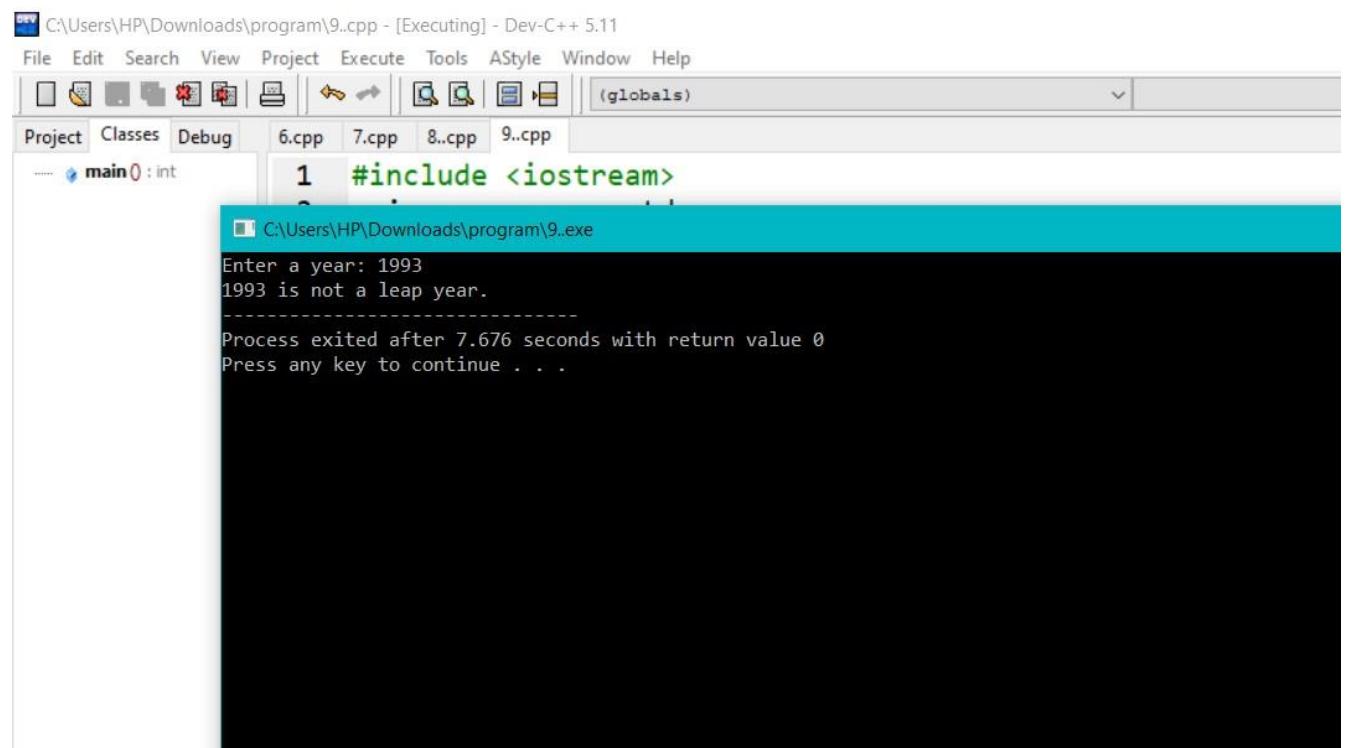
7. WAP to check Leap Year.

INPUT

```
#include <iostream>  
  
using namespace std;  
  
int main() {  
  
    int year;  
    cout << "Enter a year: ";  
    cin >> year;  
  
    if (year % 400 == 0) {  
        cout << year << " is a leap year.";  
    }  
  
    else if (year % 100 == 0) {  
        cout << year << " is not a leap year.";  
    }  
}
```

```
else if (year % 4 == 0) {  
    cout << year << " is a leap year.";  
}  
  
else {  
    cout << year << " is not a leap year.";  
}  
  
return 0;  
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11  
File Edit Search View Project Execute Tools AStyle Window Help  
Project Classes Debug 6.cpp 7.cpp 8..cpp 9..cpp (globals)  
---- main() : int  
1 #include <iostream>  
C:\Users\HP\Downloads\program\9.exe  
Enter a year: 1993  
1993 is not a leap year.  
-----  
Process exited after 7.676 seconds with return value 0  
Press any key to continue . . .
```

8. WAP for finding remainder of division of 2 numbers.

INPUT

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

int main()
{
    int divisor, dividend, quotient, remainder;

    cout << "Enter dividend: ";
    cin >> dividend;

    cout << "Enter divisor: ";
    cin >> divisor;

    quotient = dividend / divisor;
    remainder = dividend % divisor;

    cout << "Quotient = " << quotient << endl;
    cout << "Remainder = " << remainder;

    return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp 7.cpp 8.cpp 9.cpp (globals)
main 0 : int
1 #include <iostream>
C:\Users\HP\Downloads\program\9.exe
Enter dividend: 32
Enter divisor: 21
Quotient = 1
Remainder = 11
-----
Process exited after 2.326 seconds with return value 0
Press any key to continue . . .
```

9. WAP to calculate Area of Rectangle

INPUT

```
#include <iostream>
using namespace std;
int main()
{
    int length, breadth, area;

    cout << "Enter the length of the rectangle: ";
    cin >> length;
    cout << "Enter the breadth of the rectangle: ";
    cin >> breadth;

    area = length * breadth;

    cout << "Area of Rectangle: " << area;
    return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)

Project Class C:\Users\HP\Downloads\program\9.exe
main
Enter the length of the rectangle: 10
Enter the breadth of the rectangle: 20
Area of Rectangle: 200
-----
Process exited after 3.815 seconds with return value 0
Press any key to continue . . .
```

10. WAP to calculate Area of Square.

INPUT

```
#include <iostream>
using namespace std;
int main()
{
    int side, area;

    cout << "Enter the side of square: ";
    cin >> side;

    area = side * side;

    cout << "Area of square of side " << side << " is: " << area;
    return 0;
}
```

OUTPUT

C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Class C:\Users\HP\Downloads\program\9.exe

main() Enter the side of square: 23
Area of square of side 23 is: 529

Process exited after 6.994 seconds with return value 0
Press any key to continue . . .

11. WAP to calculate the area of Triangle.

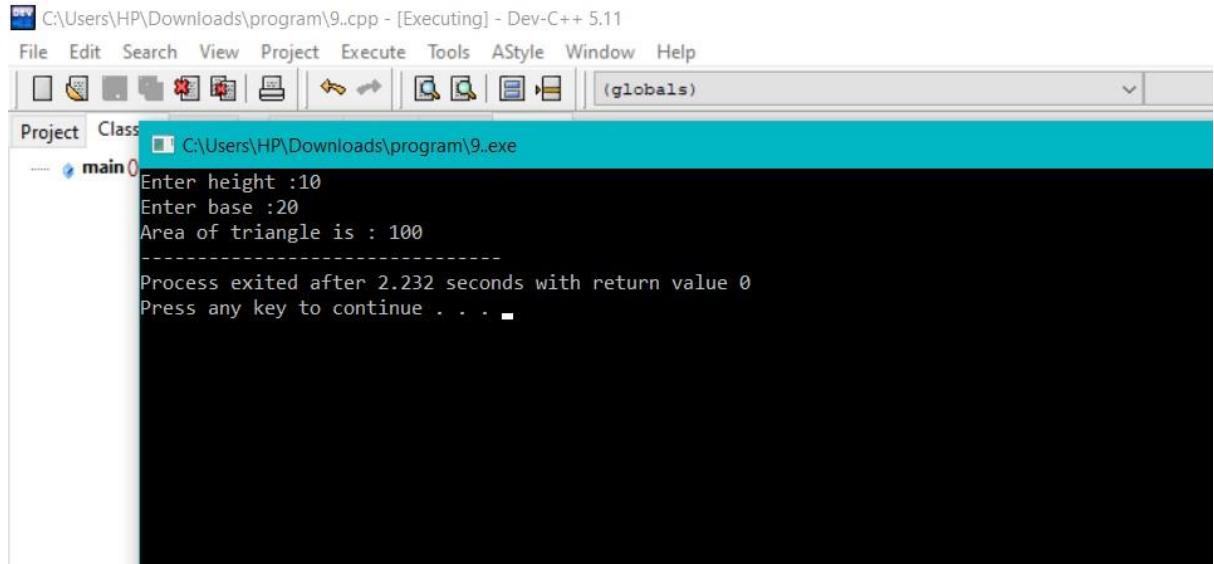
INPUT

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

int main()
{
    int height, base;
    float ans;
    cout<<"Enter height :";
    cin>>height;
    cout<<"Enter base :";
    cin>>base;
    ans= (0.5)*height*base;

    cout<<"Area of triangle is : "<<ans;
    return 0;
}
```

OUTPUT



The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help. Below the menu is a toolbar with various icons. The main window has tabs for "Project" and "Class". The "main.o" tab is selected, showing the code and its output. The output window displays:

```
C:\Users\HP\Downloads\program\9..exe
Enter height :10
Enter base :20
Area of triangle is : 100
-----
Process exited after 2.232 seconds with return value 0
Press any key to continue . . .
```

12. WAP to calculate Area and Circumference of Circle.

INPUT

```
#include <iostream>
#define PI 3.14159
using namespace std;

int main()
{
    float radius, area, circum;
    cout << "\n Type a Number to find area and circumference of any circle :";
    cin>>radius;

    circum = 2*PI*radius;
    area = PI*(radius*radius);
    cout<<" The area of the circle is :"<< area << endl;
    cout<<" The circumference of the circle is :"<< circum << endl;

    cout << endl;
    return 0;
}
```

OUTPUT

The screenshot shows a Dev-C++ window with the title bar "C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes "File" and "Project". The main window displays the following output:

```
Type a Number to find area and circumference of any circle :35
The area of the circle is : 3848.45
The circumference of the circle is : 219.911

-----
Process exited after 1.837 seconds with return value 0
Press any key to continue . . .
```

13. WAP for two item's weight (floating points' values) and number of purchase (floating points' values) and calculate the average value of the items.

Test Data:

Weight - Item1: 15

No. of item1: 5

Weight - Item2: 25

No. of item2: 4

Expected Output:

Average Value = 19.444444

INPUT

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
{
    double wi1, ci1, wi2, ci2, result;
    cout<<"Weight - Item1: ";
    cin>>wi1;
    cout<<"No. of item1: ";
    cin>>ci1;
    cout<<"Weight - Item2: ";
    cin>>wi2;
    cout<<"No. of item2: ";
    cin>>ci2;
    result = ((wi1 * ci1) + (wi2 * ci2)) / (ci1 + ci2);
    cout<<"Average Value = %f\n", result);
    return 0;
}
```

OUTPUT

```
Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11
File View Project Execute Tools AStyle Window Help
s Debug 6.cpp C:\Users\HP\Downloads\program\9.exe
1 No. of item1: 5
2 Weight - Item2: 25
3 No. of item2: 4
4 19.4444
5 -----
6 Process exited after 29.28 seconds with return value 0
7 Press any key to continue . . .
8
9
10
11
12
```

14. WAP to calculate a bike's average consumption from the given total distance (integer value) travelled (in km) and spent fuel.

Test Data:

Input total distance in km: 350

Input total fuel spent in litres: 5

Expected Output:

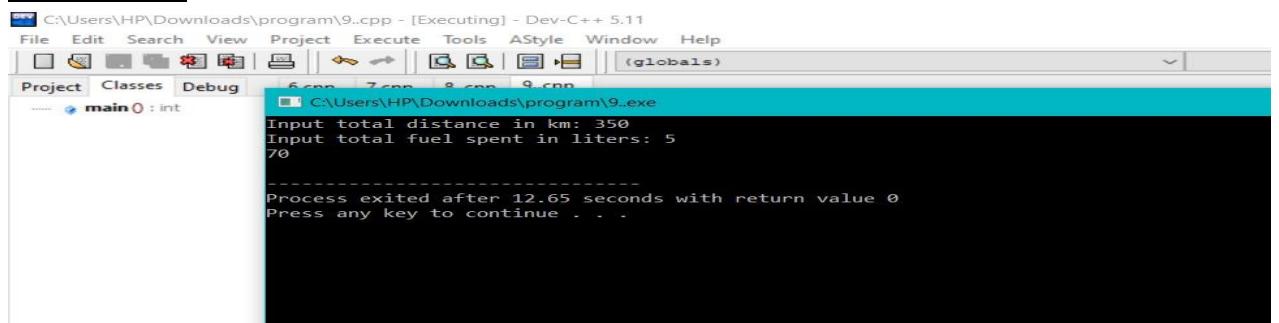
Average consumption (km/lt) 70.00

INPUT

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

```
int main()
{
    int x;
    float y;
    cout<<"Input total distance in km: ";
    cin>>x;
    cout<<"Input total fuel spent in liters: ";
    cin>>y;
    cout<<("Average consumption (km/lt) %.3f ",x/y);
    cout<<("\n");
    return 0;
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug
main() : int
C:\Users\HP\Downloads\program\9.exe
Input total distance in km: 350
Input total fuel spent in liters: 5
70
Process exited after 12.65 seconds with return value 0
Press any key to continue . . .
```

15. Write a program that will give the grade of the student based on the percentage he got in the course.

Use the following criteria for assigning grades:

Grade = A (when percentage ≥ 60)

Grade = B (when percentage ≥ 50 and percentage < 60)

Grade = C (when percentage ≥ 40 and percentage < 50)

Grade = D (when percentage ≥ 30 and percentage < 40)

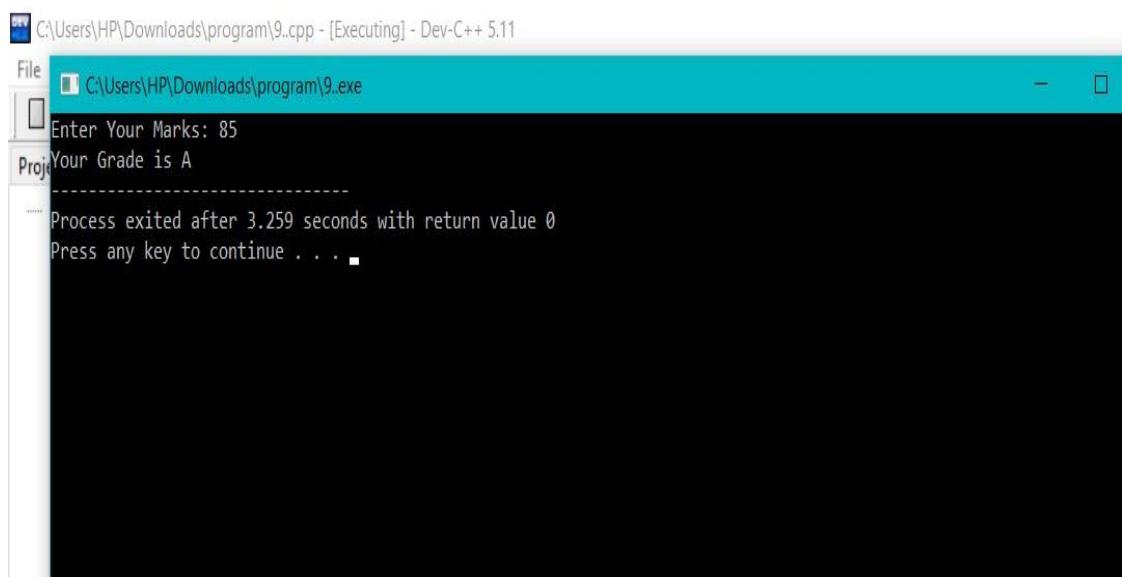
INPUT

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

int main()
{
    int marks;
    cout<<"Enter Your Marks: ";
    cin>>marks;
    if (marks  $\geq 90$ ){
        cout<<"Your Grade is A+";
    }
    else if (marks  $\geq 80$ ){
        cout<<"Your Grade is A";
    }
    else if (marks  $\geq 70$ ){
        cout<<"Your Grade is B+";
    }
}
```

```
else if (marks >= 60){  
    cout<<"Your Grade is B";  
}  
  
else if (marks >= 50){  
    cout<<"Your Grade is C";  
}  
  
else if (marks >= 40){  
    cout<<"Your Grade is D";  
}  
  
else if (marks >= 30){  
    cout<<"Your Grade is E";  
}  
  
else if (marks <= 30){  
    cout<<"Your Grade is F";  
}  
  
else{  
    cout<<"Enter Valid Marks";  
}  
  
return 0;  
}
```

OUTPUT



The screenshot shows a Dev-C++ terminal window with the following text:

```
C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11  
File C:\Users\HP\Downloads\program\9.exe  
Enter Your Marks: 85  
Your Grade is A  
-----  
Process exited after 3.259 seconds with return value 0  
Press any key to continue . . .
```

16. WAP to check whether a number is divisible by 5.

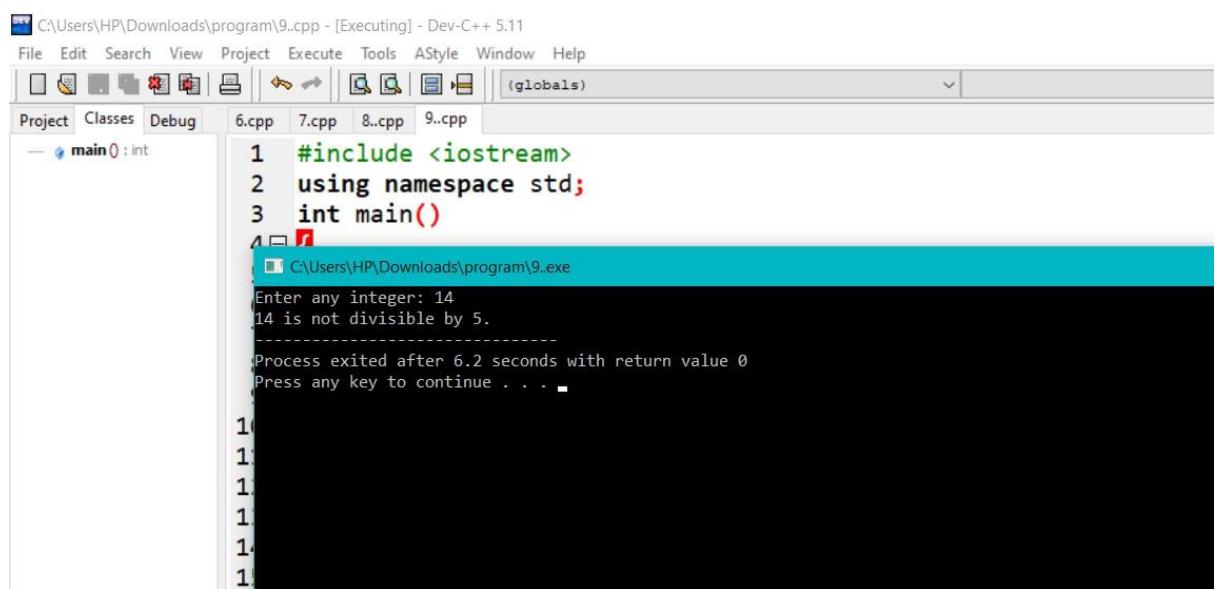
INPUT

```
#include <iostream>
using namespace std;
int main()
{
    int num;

    cout << "Enter any integer: ";
    cin >> num;

    if (num % 5 == 0){
        cout << num << " is divisible by 5.";
    }
    else {
        cout << num << " is not divisible by 5.";
    }
    return 0;
}
```

OUTPUT



The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\9.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The global status bar shows "(globals)". The project tab bar has tabs for 6.cpp, 7.cpp, 8..cpp, and 9..cpp, with 9..cpp currently selected. The code editor window displays the C++ code. The terminal window at the bottom shows the execution results:

```
C:\Users\HP\Downloads\program\9.exe
Enter any integer: 14
14 is not divisible by 5.

Process exited after 6.2 seconds with return value 0
Press any key to continue . . .
```

The terminal window also contains several "1" characters, likely from previous executions or noise.

17. WAP to input basic salary of an employee and calculate its Gross salary according to following:

Basic Salary <= 10000 : HRA = 20%, DA = 80%

Basic Salary <= 20000 : HRA = 25%, DA = 90%

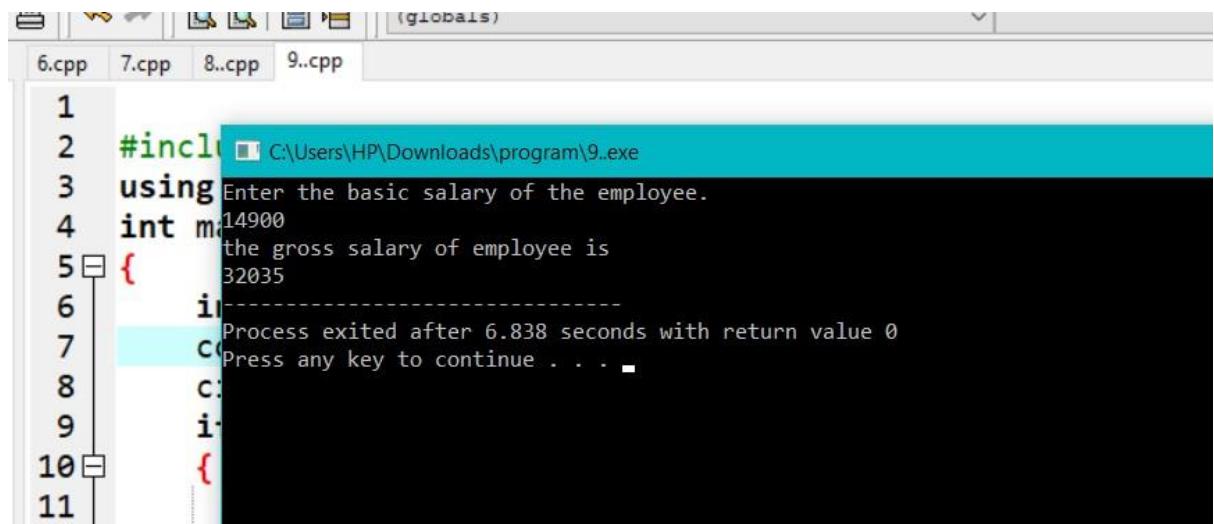
Basic Salary > 20000 : HRA = 30%, DA = 95%

INPUT

```
#include<iostream>
using namespace std;
int main ()
{
    int salary,gross,hra,da;
    cout<<"Enter the basic salary of the employee."<<endl;
    cin>>salary;
    if(salary<= 10000)
    {
        da=salary*20/100;
        hra=salary*80/100;
        gross=salary+da+hra;
        cout<<"the gross salary of the employee is"<<endl<<gross;
    }
    if(salary<= 20000)
    {
        da=salary*25/100;
        hra=salary*90/100;
        gross=salary+da+hra;
        cout<<"the gross salary of employee is"<<endl<<gross;
    }
    else if(salary>20000)
    {
        da=salary*30/100;
        hra=salary*95/100;
        gross=salary+da+hra;
        cout<<"the gross salary of employee is"<<endl<<gross;
    }
    else
    {
        cout<<"you have no salary"<<endl;
```

```
    }  
}
```

OUTPUT



```
1  
2 #include <iostream>  
3 using namespace std;  
4 int main()  
5 {  
6     int basic_salary;  
7     cout << "Enter the basic salary of the employee." << endl;  
8     cin >> basic_salary;  
9     float gross_salary = basic_salary + (basic_salary * 0.07);  
10    cout << "the gross salary of employee is " << gross_salary << endl;  
11 }
```

C:\Users\HP\Downloads\program\9..exe
Enter the basic salary of the employee.
14900
the gross salary of employee is
32035

Process exited after 6.838 seconds with return value 0
Press any key to continue . . .

18. WAP to input electricity unit charges and calculate total electricity bill according to the given condition:

For first 50 units Rs. 0.50/unit

For next 100 units Rs. 0.75/unit

For next 100 units Rs. 1.20/unit

For unit above 250 Rs. 1.50/unit

An additional surcharge of 20% is added to the bill

INPUT

```
#include<iostream>
using namespace std;
int main()
{
    int unit;
    float amount,total_amount,s_charge;
    cout<<"enter the number of units you consumed"<<endl;
    cin>>unit;
    switch(unit<=50)
    {
        case 1:
            amount=unit*0.50;
            break;
        case 0:
            switch(unit<=150)
            {
                case 1:
                    amount=25+(unit-50)*0.75;
                    break;
                case 0:
                    switch(unit<=250)
                    {
                        case 1:
                            amount=100+(unit-150)*1.20 ;
                            break;
                        case 0:
                            amount=220+(unit-250)*1.50;
                            break;
                    }
            }
    }
}
```

```

    }
break;
}
break;
}
s_charge=amount*0.20;
total_amount=amount+s_charge;
cout<<"your total bill is Rs"<<total_amount;
}

```

OUTPUT

DEV C:\Users\HP\Downloads\program\9..cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

Project Classes Debug 6.cpp 7.cpp 8..cpp 9..cpp (globals)

main 0 : int

```

1
2 #include<iostream>
3 using namespace std;
4 int main()
5 {
6     cout << "enter the number of units you consumed" << endl;
7     int units;
8     cin >> units;
9     float amount = 5.5;
10    float s_charge = amount * 0.20;
11    float total_amount = amount + s_charge;
12    cout << "your total bill is Rs" << total_amount;
13 }

```

C:\Users\HP\Downloads\program\9..exe

enter the number of units you consumed
78
your total bill is Rs55.2

Process exited after 3.992 seconds with return value 0
Press any key to continue . . .

1
1
1
1

C++ ASSIGNMENT 1.2

1. WAP for printing all natural numbers till 20.

INPUT

```
#include <iostream>
```

```

using namespace std;

int main()
{
    int i;

    cout << "\n\n first 20 natural numbers are:\n";
    cout << "-----\n";
    cout << " The natural numbers are: \n";
    for (i = 1; i <= 20; i++)
    {
        cout << i << endl;
    }
    cout << endl;
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The project name is 'new.cpp'. The terminal window displays the following output:

```

1 #include <iostream>
2 using namespace std;
3 int main()
4 {
5     cout << "-----\n";
6     cout << " The natural numbers are: \n";
7     for (int i = 1; i <= 20; i++)
8     {
9         cout << i << endl;
10    }
11
12
13
14
15
16
17
18
19
20
-----
```

Process exited after 0.116 seconds with return value 0
Press any key to continue . . .

- WAP for printing all natural numbers in reverse order starting from 20.

INPUT

```

#include <iostream>
using namespace std;
int main()
{
    int i;
```

```

cout << "\n\n All natural numbers in reverse order starting from 20:\n";
cout << "-----\n";
cout << " The natural numbers are: \n";
for (i = 20; i >= 1; i--)
{
    cout << i << endl;
}
cout << endl;
}

```

OUTPUT

```

All natural numbers in reverse order starting from 20:
-----
The natural numbers are:
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

```

Process exited after 0.01519 seconds with return value 0
Press any key to continue . . .

3. WAP for printing all even numbers from 1 to 20.

Input

```

#include<iostream>
using namespace std;

```

```
int main()
```

```
{

```

```
    int i;
```

```

    cout << "\nList of Even Numbers from 1 to 20 " << endl;
    for (i = 1; i <= 20; i++)
    {

```

```

        if ( i % 2 == 0 )
        {
            cout << i << endl;
        }
    }

    return 0;
}

```

Output

```

1 #include<iostream>
2 using namespace std;
3
4 int main()
5 {
6     int i;
7
8     cout << "List of Even Numbers from 1 to 20" << endl;
9
10    for (i = 2; i <= 20; i += 2)
11    {
12        cout << i << endl;
13    }
14
15    cout << endl;
16
17    cout << "Process exited after 0.1317 seconds with return value 0" << endl;
18
19    return 0;
}

```

4. WAP for printing all odd numbers from 1 to 20.

INPUT

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

```
int main()
```

```
{
```

```
    int i;
```

```
    cout << "\nList of Even Numbers from 1 to 20 " << endl;
```

```
    for (i = 1; i <= 20; i++)
    {
```

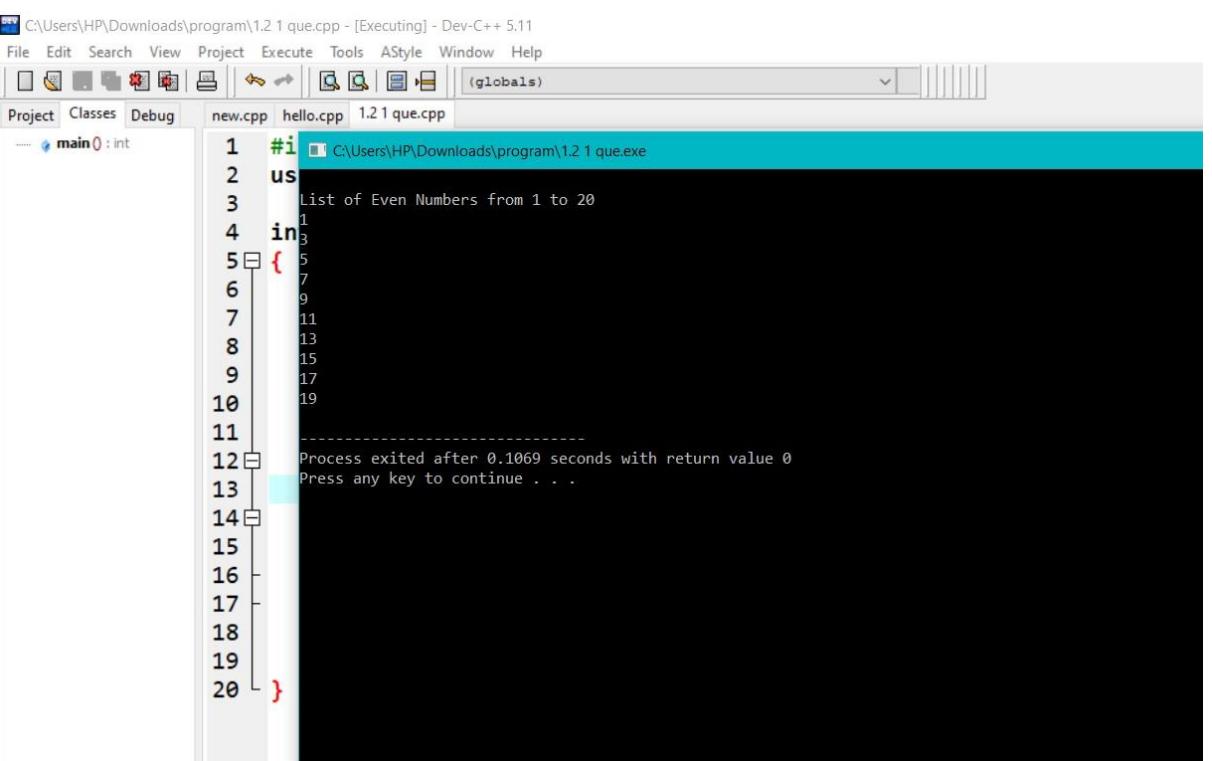
```
        if ( i % 2 != 0 )
    {
```

```
            cout << i << endl;
    }
```

```
}
```

```
}
```

```
        return 0;  
    }  
OUTPUT
```



```
C:\Users\HP\Downloads\program\1.2.1 que.cpp - [Executing] - Dev-C++ 5.11  
File Edit Search View Project Execute Tools AStyle Window Help  
(globals)  
Project Classes Debug new.cpp hello.cpp 1.2.1 que.cpp  
--- main() : int  
1 #include <iostream>  
2 using namespace std;  
3 int main()  
4 {  
5     int i,sum=0;  
6     cout << "\n\n Find the first 20 natural numbers:\n";  
7     cout << "-----\n";  
8     cout << " The natural numbers are: \n";  
9     for (i = 1; i <= 20; i++)  
10    {  
11        cout << i << " ";  
12        sum=sum+i;  
13    }  
14    cout << "\n The sum of 20 natural numbers are: "<<sum << endl;  
15 }  
Process exited after 0.1069 seconds with return value 0  
Press any key to continue . . .
```

5. WAP for adding all numbers from 1 to 20.

INPUT

```
#include <iostream>  
using namespace std;  
int main()  
{  
    int i,sum=0;  
    cout << "\n\n Find the first 20 natural numbers:\n";  
    cout << "-----\n";  
    cout << " The natural numbers are: \n";  
    for (i = 1; i <= 20; i++)  
    {  
        cout << i << " ";  
        sum=sum+i;  
    }  
    cout << "\n The sum of 20 natural numbers are: "<<sum << endl;  
}
```

OUTPUT

The screenshot shows a C++ IDE interface with a menu bar (Search, View, Project, Execute, Tools, AStyle, Window, Help) and a toolbar with icons for file operations. Below the toolbar, tabs show 'new.cpp', 'hello.cpp', '1.21 que.cpp', and '(globals)'. The main window displays the following text:

```
1 #include <iostream>
C:\Users\HP\Downloads\program\1.21 que.exe

Find the first 20 natural numbers:
-----
The natural numbers are:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
The sum of 20 natural numbers are: 210

-----
Process exited after 0.111 seconds with return value 0
Press any key to continue . . .
```

6. WAP for finding sum of all even numbers till 20.

INPUT

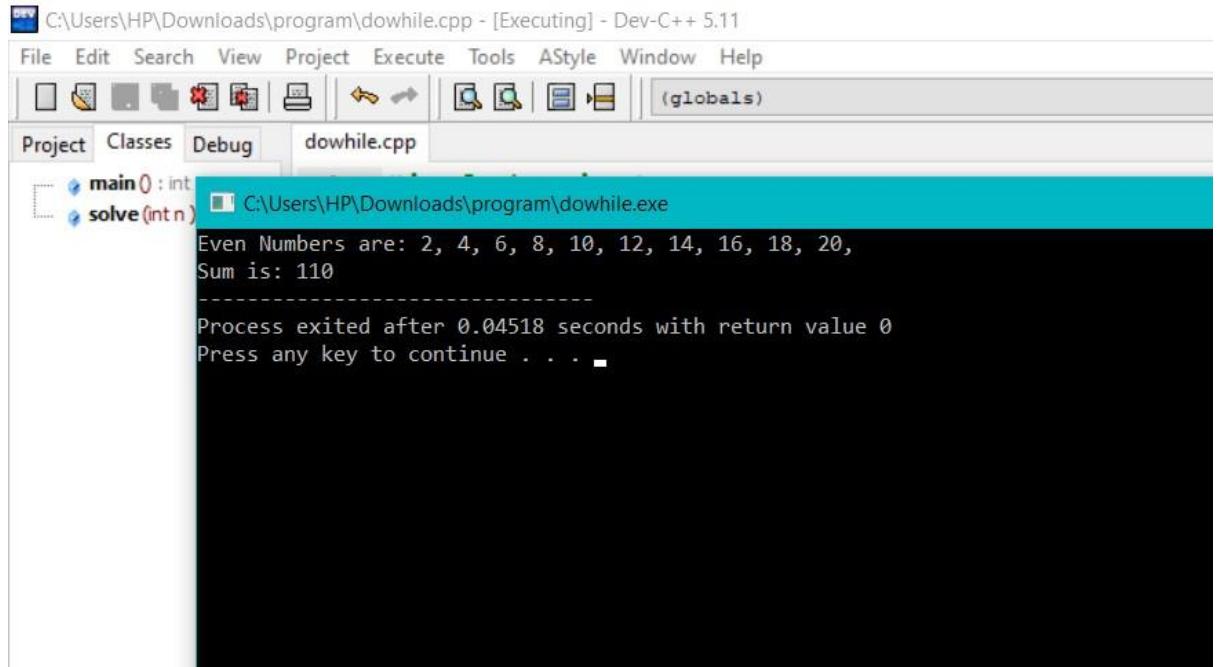
```
#include <iostream>
using namespace std;

int solve( int n ) {
    int i;
    int sum = 0;
    cout << "Even Numbers are: ";
    for( i = 1; i <= n; i++ ) {
        if( i % 2 == 0 ) {
            cout << i << ", ";
            sum = sum + i;
        }
    }

    cout << endl;
    return sum;
}

int main(){
    int sum = solve( 20 );
    cout << "Sum is: " << sum;
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\dowhile.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug dowhile.cpp
main() : int
solve(int n)
Even Numbers are: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20,
Sum is: 110
-----
Process exited after 0.04518 seconds with return value 0
Press any key to continue . . .
```

7. WAP for finding sum of all odd numbers till 20.

INPUT

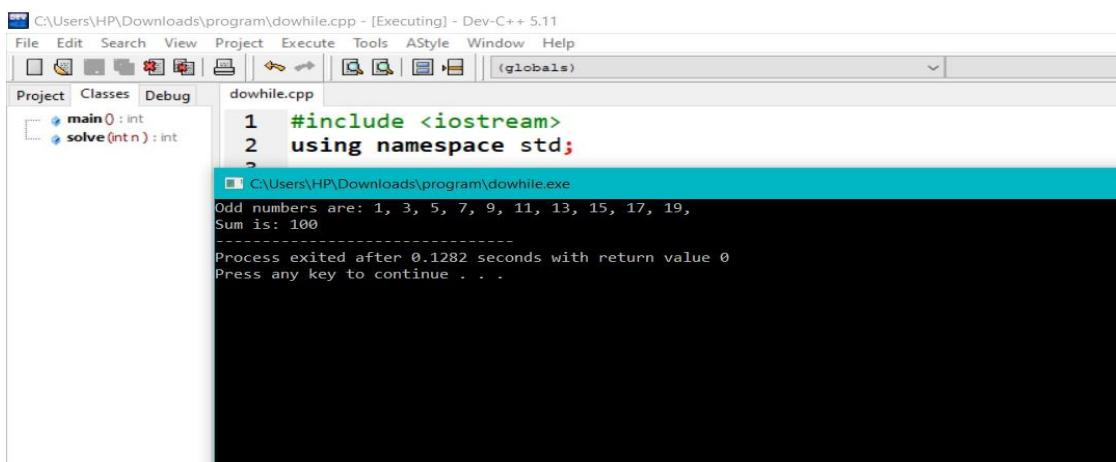
```
#include <iostream>
using namespace std;

int solve( int n )
{
    int i;
    int sum = 0;
    cout << "Odd numbers are: ";
    for( i = 1; i <= n; i++ )
    {
        if( i % 2 == 1 ) {
            cout << i << ", ";
            sum = sum + i;
        }
    }

    cout << endl;
    return sum;
}

int main(){
    int sum = solve( 20 );
    cout << "Sum is: " << sum;
}
```

OUTPUT



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

int main() {
    solve(10);
}

int solve(int n) : int {
    if (n == 1)
        return 1;
    else
        return n + solve(n - 2);
}
```

8. WAP for printing multiplication table of a number. For eg. Display should be “ 2 X 1 = 2”

INPUT

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

```
int main() {
    int n;

    cout << "Enter a positive integer: ";
    cin >> n;

    for (int i = 1; i <= 10; ++i)
    {
        cout << n << " * " << i << " = " << n * i << endl;
    }

    return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\dowhile.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)

Project Classes Debug [*] dowhile.cpp
main 0 : int C:\Users\HP\Downloads\program\dowhile.exe

Enter a positive integer: 10
10 * 1 = 11
10 * 2 = 12
10 * 3 = 13
10 * 4 = 14
10 * 5 = 15
10 * 6 = 16
10 * 7 = 17
10 * 8 = 18
10 * 9 = 19
10 * 10 = 20

-----
Process exited after 2.185 seconds with return value 0
Press any key to continue . . .
```

9. WAP to calculate factorial of a number.

INPUT

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

int factorial(int n);

int main() {

    int n;

    cout << "Enter a positive integer: ";
    cin >> n;

    cout << "Factorial of " << n << " = " << factorial(n);

    return 0;
}

int factorial(int n) {
    if(n > 1)
        return n * factorial(n - 1);
    else
        return 1;
}
```

OUTPUT

```
1
2 #include<iostream>
3 using namespace std;
4
5 C:\Users\HP\Downloads\program\dowhile.exe
6 Enter a positive integer: 5
7 Factorial of 5 = 120
8 -----
9 Process exited after 2.344 seconds with return value 0
10 Press any key to continue . . .
```

10. WAP to check whether a number is prime or not.

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

int main() {

    int i, n;
    bool is_prime = true;

    cout << "Enter a positive integer: ";
    cin >> n;

    if (n == 0 || n == 1) {
        is_prime = false;
    }

    for (i = 2; i <= n/2; ++i) {
        if (n % i == 0) {
            is_prime = false;
            break;
        }
    }

    if (is_prime)
        cout << n << " is a prime number";
    else
        cout << n << " is not a prime number";

    return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\dowhile.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes C:\Users\HP\Downloads\program\dowhile.exe
main 0 : int
Enter a positive integer: 7
7 is a prime number
-----
Process exited after 1.558 seconds with return value 0
Press any key to continue . . .
```

11. WAP to print all digits of a number and their sum.

INPUT

```
#include<iostream>
using namespace std;
int main()
{
    int x, s = 0;
    cout << "Enter the number : ";
    cin >> x;
    while (x != 0) {
        s = s + x % 10;
        x = x / 10;
    }
    cout << "\nThe sum of the digits : "<< s;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\dowhile.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug dowhile.cpp
main 0 : int
C:\Users\HP\Downloads\program\dowhile.exe
Enter the number : 999
The sum of the digits : 27
-----
Process exited after 2.384 seconds with return value 0
Press any key to continue . . .
```

12. WAP to print reverse of a number.

INPUT

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

int main()
{
    int n, reversed_number = 0, remainder;

    cout << "Enter an integer: ";
    cin >> n;

    while(n != 0) {
        remainder = n % 10;
        reversed_number = reversed_number * 10 + remainder;
        n /= 10;
    }

    cout << "Reversed Number = " << reversed_number;

    return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\dowhile.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)

Project Class C:\Users\HP\Downloads\program\dowhile.exe
main() Enter an integer: 123
Reversed Number = 321
-----
Process exited after 3.521 seconds with return value 0
Press any key to continue . . .
```

13. WAP to check whether the number is Armstrong or not.

INPUT

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

int main() {
    int num, originalNum, remainder, result = 0;
    cout << "Enter a three-digit number: ";
    cin >> num;
    originalNum = num;

    while (originalNum != 0)
    {

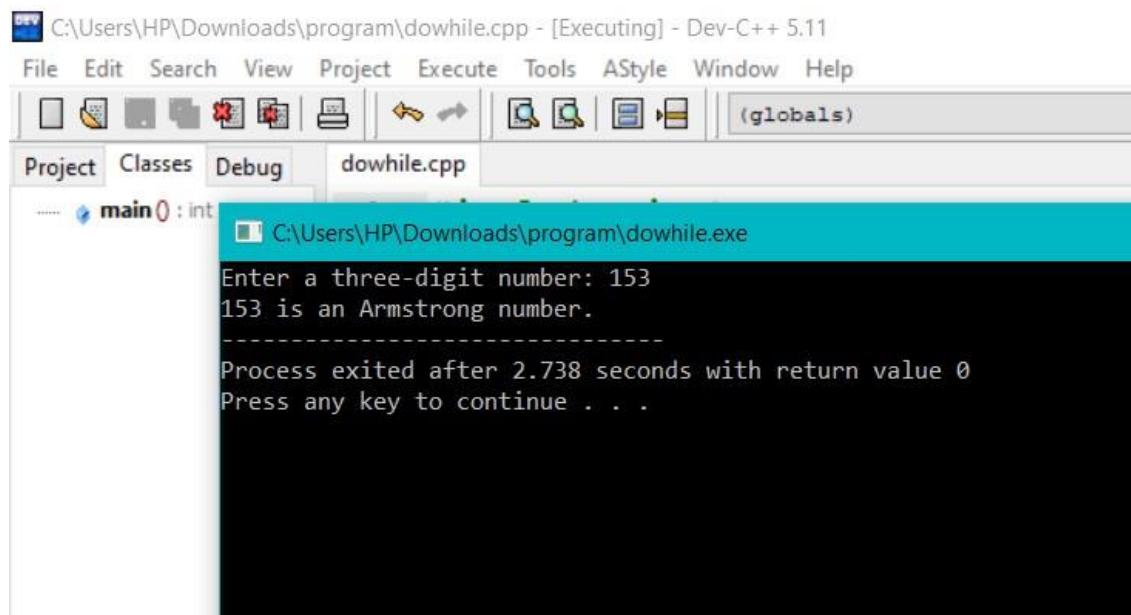
        remainder = originalNum % 10;
        result += remainder * remainder * remainder;

        originalNum /= 10;
    }

    if (result == num)
        cout << num << " is an Armstrong number.";
    else
        cout << num << " is not an Armstrong number.';

    return 0;
}
```

OUTPUT



```
main 0 : int C:\Users\HP\Downloads\program\dowhile.exe
Enter a three-digit number: 153
153 is an Armstrong number.

Process exited after 2.738 seconds with return value 0
Press any key to continue . . .
```

14. WAP to print the Fibonacci series in a given range.

INPUT

```

#include <iostream>
using namespace std;

int main() {
    int n, t1 = 0, t2 = 1, nextTerm = 0;

    cout << "Enter a number :";
    cin >> n;

    cout << "Fibonacci Series: \n";

    for (int i = 1; i <= n; ++i) {

        if(i == 1) {
            cout << t1 << ", ";
            continue;
        }
        if(i == 2) {
            cout << t2 << ", ";
            continue;
        }
        nextTerm = t1 + t2;
        t1 = t2;
        t2 = nextTerm;

        cout << nextTerm << ", ";
    }
    return 0;
}

```

OUTPUT

15. WAP to check whether the number entered is palindrome or not.

INPUT

```

#include <iostream>
using namespace std;

int main()
{
    int n, num, digit, rev = 0;

```

```

cout << "Enter a number: ";
cin >> num;

n = num;

do
{
    digit = num % 10;
    rev = (rev * 10) + digit;
    num = num / 10;
} while (num != 0);

cout << " The reverse of the number is: " << rev << endl;

if (n == rev)
    cout << " The number is a palindrome.";
else
    cout << " The number is not a palindrome./";

return 0;
}

```

OUTPUT

C:\Users\HP\Downloads\program\dowhile.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug dowhile.cpp

.... main 0 : int

7

C:\Users\HP\Downloads\program\dowhile.exe

Enter a number: 10

The reverse of the number is: 1

The number is not a palindrome.

Process exited after 1.94 seconds with return value 0

Press any key to continue . . .

C++ ASSIGNMENT 1.3

1. WAP to print following kind of pattern

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

INPUT

```
#include <iostream>  
using namespace std;  
  
void star(int n)  
{  
  
    for (int i = 0; i < n; i++)  
    {  
  
        for (int j = 0; j <= i; j++)  
        {  
  
            cout << "* ";  
        }  
  
        cout << endl;  
    }  
}
```

```
}

}

int main()
{
    int n = 5;
    star(n);
    return 0;
}
```

OUTPUT

```
ds\program\pyramid.cpp - [Executing] - Dev-C++ 5.11
w Project Execute Tools AStyle Window Help
pyramid.cpp (globals) ▾
1 #include <iostream>
2 C:\Users\HP\Downloads\program\pyramid.exe
3 *
4 * *
5 * * *
6 * * * *
7 -----
8 [Process exited after 0.1173 seconds with return value 0
9 Press any key to continue . . . ]
```

```
2.      *
      **
      ***
      ****
      *****
```

INPUT

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

int main()
{
    int n = 5;
    for (int i = n; i > 0; i--)
    {
        for (int j = 1; j <= n; j++)
        {
            if (j >= i) {
                cout << "* ";
            }
            else {
                cout << " ";
            }
        }
    }
}
```

```
    }  
}  
cout << endl;  
}  
return 0;  
}
```

OUTPUT

A screenshot of a C++ development environment. The menu bar includes 'File', 'View', 'Project', 'Execute', 'Tools', 'AStyle', 'Window', and 'Help'. The toolbar contains icons for file operations like Open, Save, and Build. A tab bar shows '(globals)' and 'pyramid.cpp'. The code editor window displays the following content:

```
1 #include <iostream>
2
3 int main()
4 {
5     cout << " * "
6     cout << " * * "
7     cout << " * * * "
8     cout << " * * * * "
9
10    cout << "-----"
11
12    cout << endl;
13
14    cout << endl;
15 }
```

The terminal window shows the execution results:

```
C:\Users\HP\Downloads\program\pyramid.exe
*
*
*
*
*
-----
Process exited after 0.1599 seconds with return value 0
Press any key to continue . . .
```

```
3.      *
***  
*****  
*****  
*****
```

INPUT

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

```
void pyramid(int n)
```

```
{
```

```
    int i = 0, j = 0, k = 0;
```

```
    while (i < n) {
```

```
        while (k <= n - i - 2) {
```

```
            cout << " ";
```

```
            k++;
```

```
}
```

```
    k = 0;
```

```
    while (j <= i) {
```

```
        cout << "* ";
```

```
        j++;
```

```
}
```

```
    j = 0;
```

```
    i++;
```

```
    cout << endl;
```

```
}
```

```
}
```

```
int main()
```

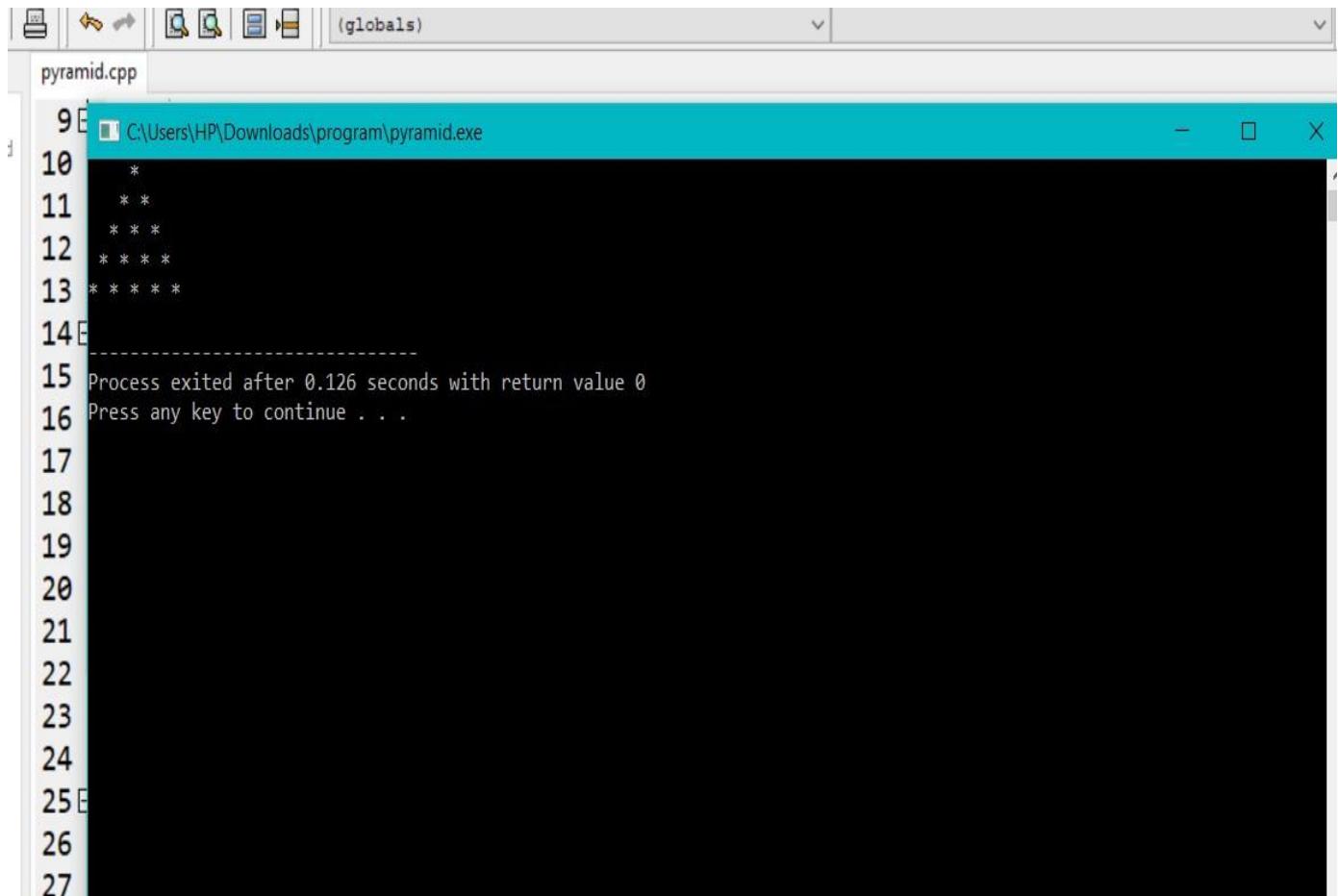
```
{
```

```
    int n = 5;
```

```
    pyramid(n);
```

```
return 0;  
}
```

OUTPUT



```
pyramid.cpp  
9 E C:\Users\HP\Downloads\program\pyramid.exe  
10 *  
11 **  
12 ***  
13 ****  
14 *****  
15 Process exited after 0.126 seconds with return value 0  
16 Press any key to continue . . .  
17  
18  
19  
20  
21  
22  
23  
24  
25 E  
26  
27
```

4. *****
**** * ***
*** ***
** **
* *

INPUT

```
#include <iostream>
using namespace std;
int main()
{
    int i, j, n=5;
    for(i = 0; i < n; i++)
    {
        for(j = 0; j < (2 * n); j++)
        {
            if(i + j <= n - 1)
                cout << "*";
            else
                cout << " ";
            if((i + n) <= j)
                cout << "*";
            else
                cout << " ";
        }
        cout << "\n";
    }
    return 0;
}
```

OUTPUT

```
am\pyramid.cpp - [Executing] - Dev-C++ 5.11
File Execute Tools AStyle Window Help
(globals)
pyramid.cpp
1 #include <iostream>
2 using namespace std;
3 C:\Users\HP\Downloads\program\pyramid.exe
4 * * * * *
5 * * *
6 * *
7 *
8 -----
9 Process exited after 0.1423 seconds with return value 0
Press any key to continue . . .
```

5. ABCD

ABC
AB
A

INPUT

```
#include <bits/stdc++.h>
using namespace std;

int main()
{
    int i, j, n = 4;
    for (i = 1; i <= n; i++)
    {
        for (j = i; j <= n; j++)
        {
            cout << (char)('A' - 1 + j) << " ";
        }
        cout << endl;
    }
    return 0;
}
```

OUTPUT

```
ramid.cpp - [Executing] - Dev-C++ 5.11
xecute Tools AStyle Window Help
cpp | (globals) | v | v |
cpp
#include <bits/stdc++.h>
u C:\Users\HP\Downloads\program\pyramid.exe
A B C D
B C D
C D
D
-----
Process exited after 0.1386 seconds with return value 0
Press any key to continue . . .
```

6. 1
12
123
1234
12345
123456

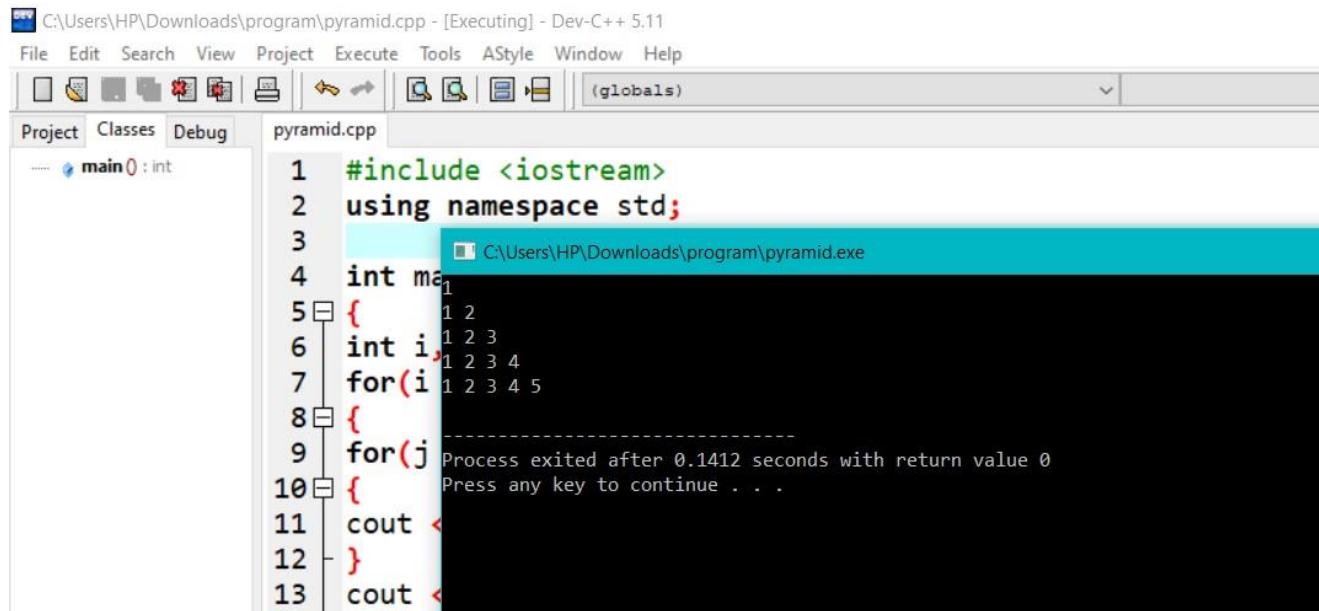
INPUT

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

int main()
{
int i, j, n=5;
for(i = 1; i <= n; i++)
{
for(j = 1; j <= i; j++)
{
cout << j << " ";
}
cout << endl;
}
```

```
return 0;  
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\pyramid.cpp - [Executing] - Dev-C++ 5.11  
File Edit Search View Project Execute Tools AStyle Window Help  
(globals)  
Project Classes Debug pyramid.cpp  
.... main() : int  
1 #include <iostream>  
2 using namespace std;  
3  
4 int main()  
5 {  
6     int i;  
7     for(i=1; i<=5; i++)  
8     {  
9         for(j=1; j<=i; j++)  
10        {  
11            cout << j;  
12        }  
13    cout << endl;  
14 }  
15 cout << endl;  
16 }  
17  
C:\Users\HP\Downloads\program\pyramid.exe  
1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5  
Process exited after 0.1412 seconds with return value 0  
Press any key to continue . . .
```

7. ABCDEEDCBA
- ABCD DCBA
- ABC CBA
- AB BA
- A A

INPUT

```
#include<iostream>  
  
using namespace std;  
  
int main()  
{  
    int i,j,k,l,m;  
    for(i=2;i<=6;i++)  
    {  
        for(k=65;k<=71-i;k++)  
            cout<<(char)k;  
  
        for(j=2;j<=i*2-1;j++)
```

```
    cout<<" ";

for(l=71-i;l>=65;l--)
    if(l!=71)
        cout<<(char)l;
    cout<<" "<<endl;
}

return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface with the file 'pyramid.cpp' open. The code prints a right-angled triangle pattern of characters A through E. The output window shows the following text:

```
2 ABCDE EDCBA
3 ABCD DCBA
4 ABC CBA
5 AB BA
6 A A
-----
8 Process exited after 0.1157 seconds with return value 0
9
10
11
12
13
```

C++ ASSIGNMENT 3 (RECURSION)

1. WAP to calculate factorial of a number.

INPUT

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

int factor(int n);

int main()
{
    int n;

    cout << "Enter a number: ";
    cin >> n;

    cout << "Factorial of " << n << " = " << factor(n);

    return 0;
}

int factor(int n) {
    if(n > 1)
        return n * factor(n - 1);
    else
        return 1;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 123.cpp
factor(int n)
main() : int
Enter a number: 25
Factorial of 25 = 2076180480
-----
Process exited after 2.97 seconds with return value 0
Press any key to continue . . .
```

2. WAP to print all digits of a number and their sum.

INPUT

```
#include <iostream>
```

```
using namespace std;
```

```
int sum_of_digit(int n)
```

```
{
```

```
    if (n == 0)
```

```
        return 0;
```

```
        return (n % 10 + sum_of_digit(n / 10));
```

```
}
```

```
int main()
```

```
{
```

```
    int num;
```

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

```
    cin>>num;
```

```
    int result = sum_of_digit(num);
```

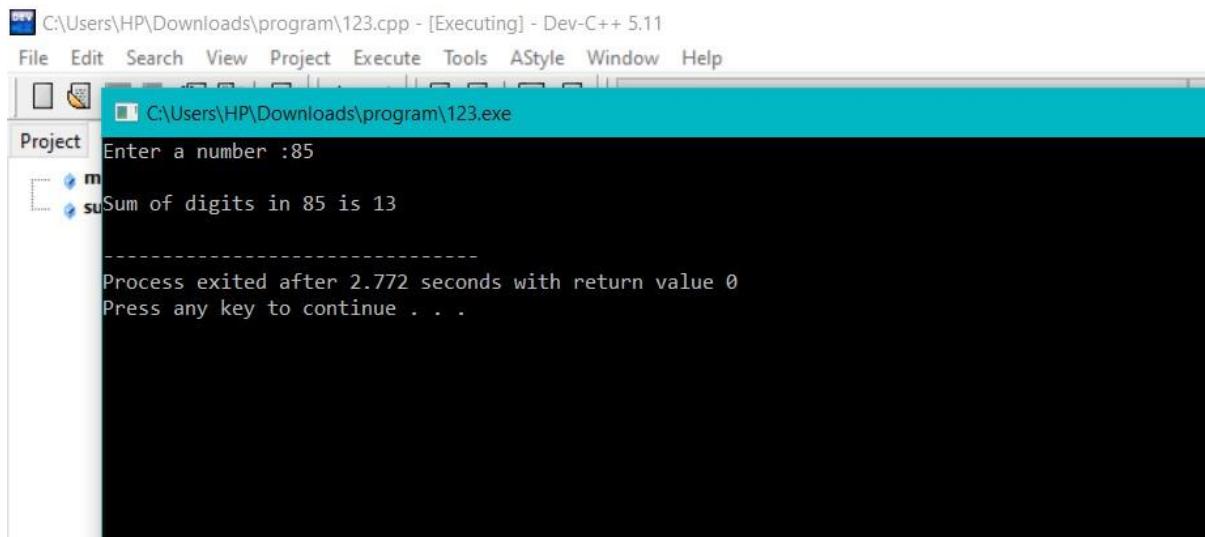
```
    cout << endl << "Sum of digits in "<< num
```

```
        <<" is "<<result << endl;
```

```
    return 0;
```

```
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project C:\Users\HP\Downloads\program\123.exe
m
suSum of digits in 85 is 13

-----
Process exited after 2.772 seconds with return value 0
Press any key to continue . . .
```

3. WAP to print reverse of a number.

INPUT

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

```
void reverse(int n)
{
```

```
    if (n < 10)
    {
        cout<<n;
        return;
    }
```

```
else{
    cout<<n%10;
    reverse(n/10);
}
```

```
int main()
{
```

```

int n;

cout<<"Enter A Number :";

cin>>n;

reverse(n);

return 0;

}

```

OUTPUT

```

C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 123.cpp
3 C:\Users\HP\Downloads\program\123.exe
4 Enter A Number :9857
5 7589
6 -----
7 Process exited after 3.846 seconds with return value 0
8 Press any key to continue . . .
9
10
11
12

```

4. WAP to check whether the number is Armstrong or not.

INPUT

```

#include<iostream>
#include<math.h>
using namespace std;
int ArmstrongNumber(int num)
{
    if(num>0)
        return (pow(num%10,3) +ArmstrongNumber(num/10));
}
int main()
{
    int num;
    cout<<"Enter a number:";
    cin>>num;
    if(ArmstrongNumber(num)==num)
        cout<<"It is Armstrong Number";
    else
        cout<<"It is not Armstrong Number";
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. Below the menu is a toolbar with icons for file operations like Open, Save, and Build. The main window has tabs for Project, Classes, Debug, and 123.cpp. The code editor shows the following C++ code:

```
1 #include<iostream>
2 #
3 u Enter a number:153
4 i It is Armstrong Number
5 {
6 Process exited after 2.915 seconds with return value 0
7 Press any key to continue . . .
```

5. WAP to print the Fibonacci series in a given range.

INPUT

```
#include <iostream>
using namespace std;
int fibo(int x)
{
    if((x==1) | |(x==0))
    {
        return(x);
    }else {
        return(fibo(x-1)+fibo(x-2));
    }
}
int main()
{
    int x , i=0;
    cout << "Enter a number : ";
    cin >> x;
    cout << "\nGiven number Fibonacci Series are : ";
    while(i < x)
    {
        cout << " " << fibo(i);
        i++;
    }
    return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The left sidebar has tabs for Project, Classes, and Debug, with '123.cpp' selected. The code editor window shows the following C++ code:

```
1 #include <iostream>
2 using namespace std;
3 int fibo(int x) : int
4 {
5     cout << "Enter a number : ";
6     int n;
7     cin >> n;
8     cout << "Given number Fibonacci Series are : ";
9     for (int i = 0; i < n; i++)
10    {
11        int f = 0;
12        if (i == 0)
13            f = 0;
14        else if (i == 1)
15            f = 1;
16        else
17            f = fibo(i - 1) + fibo(i - 2);
18        cout << f << " ";
19    }
20    cout << endl;
21 }
```

The output window shows the program's execution:

```
C:\Users\HP\Downloads\program\123.exe
Enter a number : 10
Given number Fibonacci Series are : 0 1 1 2 3 5 8 13 21 34
Process exited after 6.699 seconds with return value 0
Press any key to continue . . .
```

6. WAP to check whether the number entered is palindrome or not.

INPUT

```
#include <iostream>
using namespace std;
int revrsnum(int num1, int num2)
{
    if (num1 == 0)
    {
        return num2;
    }
    num2 *= 10;
    num2 += (num1 % 10);
    num1 = num1/10;
    return revrsnum(num1, num2);
}
int main()
{
    int num;
    cout<<"Enter A Number :";
    cin>>num;
    int num2 = revrsnum(num,0);
    if (num == num2)
    {
        cout <<num<<" is Palindrome Number!";
    }
    else
    {
        cout <<num<<" is not a Palindrome Number!";
    }
    return 0;
}
```

OUTPUT

DEV C++ C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

Project Classes Debug 123.cpp

```
1 #include <iostream>
2 .
3 Enter A Number :5
4 5 is Palindrome Number!
5 -----
6 Process exited after 2.458 seconds with return value 0
7
8
9
10
```

C++ ASSIGNMENT 4 (ARRAYS)

1. Write a program that asks the user to take array of 10 integers. The program must compute and write how many integers are greater than or equal to 10

INPUT

```
#include <iostream>
using namespace std;
int main()
{
    int a[10], min=0;
    for(int i=0; i<10; i++)
    {
        cout<<"Enter a number"<<endl;
        cin>>a[i];
    }
    for(int j=0; j<10; j++)
    {
        if(a[j]>=10)
            min++;
    }
    cout<<"NUMBERS GREATER THAN EQUAL TO 10 IS:"<<min<<endl;
    return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ 5.11 IDE interface. The title bar says "C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The status bar at the bottom shows "Process exited after 10.44 seconds with return value 0" and "Press any key to continue . . .". The code editor window displays the following:

```
#include <iostream>
using namespace std;
int main()
{
    int a[10];
    cout << "Enter a number" << endl;
    cin >> a[0];
    cout << "Enter a number" << endl;
    cin >> a[1];
    cout << "Enter a number" << endl;
    cin >> a[2];
    cout << "Enter a number" << endl;
    cin >> a[3];
    cout << "Enter a number" << endl;
    cin >> a[4];
    cout << "Enter a number" << endl;
    cin >> a[5];
    cout << "Enter a number" << endl;
    cin >> a[6];
    cout << "Enter a number" << endl;
    cin >> a[7];
    cout << "Enter a number" << endl;
    cin >> a[8];
    cout << "Enter a number" << endl;
    cin >> a[9];
    cout << "NUMBERS GREATER THAN EQUAL TO 10 IS:" << min << endl;
    return 0;
}
```

1. Write a program that asks the user to take array of 10 integers. The program must output the largest element in the array, and the index at which that element was found.

INPUT

```
#include <iostream>
```

```

using namespace std;
int main()
{
    int a[10],i,b,l,l;
    cout<<"Enter 10 NUMBERS :"<<' ';
    for(int i=0; i<10; i++)
    {
        cin>>a[i];
    }
    l=a[0];
    for( b=0; b<10; b++)
    {
        if(a[b]>l)
        {
            l=a[b];
            b=l;
        }
    }
    cout<<"largest no is "<< ' '<<l<<' '<<"at the INDEX of "<< ' '<<l<<endl;
    return 0;
}

```

OUTPUT

C:\Users\HP\Downloads\program\123.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug 123.cpp

main() : int

```

1 #include <iostream>
2 using namespace std;
3 int a[10];
4 for(int i=0; i<10; i++)
5 {
6     cout << "Enter 10 NUMBERS :" << endl;
7     cin >> a[i];
8 }
9 cout << "largest no is " << a[9] << endl;
10 cout << "at the INDEX of " << 9 << endl;
11 cout << endl;
12 cout << "-----" << endl;
13 cout << "Process exited after 10.39 seconds with return value 0" << endl;
14 cout << "Press any key to continue . . ." << endl;
15
16

```

3. Write a program that asks the user to take array of 10 integers. The program will then sort the array in descending order and display it.

INPUT

```

#include<iostream>
using namespace std;
int main ()
{
    int a[10];

```

```

int i, j, desc;

cout<<" Enter 10 Numbers :"<<endl;
cout<<" ";
for (i = 0; i < 10; ++i)
cin>>a[i];

for (i = 0; i < 10; ++i)
{
    for (j = i + 1; j < 10; ++j)
    {
        if (a[i] < a[j])
        {
            desc = a[i];
            a[i] = a[j];
            a[j] = desc;
        }
    }
}
cout<<" Numbers in Descending Order :"<<endl ;
for (i = 0; i < 10; ++i)
{
    cout<<" ";
    cout<<a[i];
    cout<<"\n";
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface during the execution of a program named 7.cpp. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The project tab shows 'main' selected. The code editor displays the sorting algorithm. The output window shows the user input and the sorted output.

```

C:\Users\HP\Downloads\program\7.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug [*] 123.cpp 7.cpp
main() : int
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

Select C:\Users\HP\Downloads\program\7.exe
Enter 10 Numbers :
1
54
7
85
6954
852
458
3
6
4
Numbers in Descending Order :
6954
852
458
85
54
7
6
4
3
1
Process exited after 10.24 seconds with return value 0
Press any key to continue . . .

```

4. Write a program that asks the user to take array of 10 integers. The program will then display either "the array is growing", "the array is decreasing", "the array is constant", or "the array is growing and decreasing."

INPUT

```
#include <iostream>
using namespace std;
int main(int argc,char*argv[])
{
    int a[10],i,grow=0,decrease=0,constant=0;
    for(i=0; i<10; i++)
    {
        cout<< "Enter a Number"<<' ';
        cin>>a[i];
    }
    for(i=0; i<10; i++)
    {

        if(a[i]<a[i+1])
        {
            grow++;
        }
        if(a[i]>a[i+1])
        {
            decrease++;
        }
        if(a[i]==a[i+1])
        {
            constant++;
        }
    }
    if(grow==9)
    {
        cout<<"The ARRAY is growing";
    }
    else if(decrease==9)
    {
        cout<<"The ARRAY is decreasing";
    }
    else if(constant==9)
    {
        cout<<"The ARRAY is Constant";
    }
    else
    {
        cout<<"The ARRAY is growing and decreasing";
    }
    return 0;
}
```

OUTPUT

```
23 main(int argc, char* argv)
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
```

C:\Users\HP\Downloads\program\123.exe

Enter a Number 1
Enter a Number 2
Enter a Number 3
Enter a Number 4
Enter a Number 5
Enter a Number 6
Enter a Number 7
Enter a Number 8
Enter a Number 9
Enter a Number 10
The ARRAY is growing and decreasing

Process exited after 7.41 seconds with return value 0
Press any key to continue . . .

5. Write a program which takes 2 arrays of 10 integers each, a and b. c is an array with 20 integers. The program should put into c the appending of b to a, the first 10 integers of c from array a, the latter 10 from b. Then the program should display c

INPUT

```
#include <iostream>
using namespace std;
int main()
{
    int a[10], b[10], c[20];
    int sizeOfa = sizeof(a)/sizeof(a[0]);
    int sizeOfb = sizeof(b)/sizeof(b[0]);
    int sizeOfc = sizeof(c)/sizeof(c[0]);

    for (int i = 0; i < sizeOfa; ++i)
    {
        cout << "Enter element " << i+1 << ":";
        cin >> a[i];
        c[i] = a[i];
    }

    cout << "Enter element for array b:" << endl;
    for (int i = 0; i < sizeOfb; ++i)
    {
        cout << "Enter element" << i+1 << ":";
        cin >> b[i];
    }

    for (int x = 0; x < 20; x++)
    {
```

```

if (x < 10)
{
    c[x] = a[x];
}

else
{
    c[x] = b[x- 10];
}

for (int x = 0; x < 20; x++)
{
    cout << c[x] << ' ';
}

int minimum = c[0];

cout<<"\nArray C is given by\n";
for(int i=0; i<20; ++i) {
    cout<<c[i]<<"\t";
    if (c[i]<minimum)
        minimum = c[i];
}
cout<<"\nMinimum value in the Array C is "<<minimum<<endl;

return 0 ;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
--- main() : int
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74 }

Enter element 1:1
Enter element 2:2
Enter element 3:3
Enter element 4:4
Enter element 5:5
Enter element 6:6
Enter element 7:7
Enter element 8:8
Enter element 9:9
Enter element 10:10
Enter element for array b:
Enter element1:11
Enter element2:22
Enter element3:33
Enter element4:44
Enter element5:55
Enter element6:66
Enter element7:77
Enter element8:88
Enter element9:99
Enter element10:100
1 2 3 4 5 6 7 8 9 10
Array C is given by
1      2      3      4      5      6      7      8      9      10
66      77      88      99      100
minimum value in the Array C is 1
Process exited after 19.25 seconds with return value 0
Press any key to continue . . .

```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\HP\Downloads\program\6.exe

Shorten compiler paths

6. Write a program that asks the user to take an array of 10 integer and an integer value V and an index value i between 0 and 9. The program must put the value V at the place i in the array, shifting each element right and dropping off the last element. The program must then write the final array.

INPUT

```
#include <iostream>
```

```
using namespace std;
```

```
const int size = 10;
```

```
int main()
```

```
{
```

```
int arr[size];
```

```
int V;
```

```
int index;
```

```
cout << " Enter 10 integers: " << endl;
```

```
for (int i = 0; i < size; i++)
```

```
{
```

```
cin >> arr[i];
```

```
}
```

```
cout << "Enter V: ";
```

```
cin >> V;
```

```
cout << "Enter index: ";
```

```
cin >> index;
```

```
for (int i = size; i > index+1; i--)
```

```
{
```

```
arr[i]=arr[i-1];
```

```

    }
    arr[index]=V;
    for (int i = 0; i < size; i++)
    {
        cout<<arr[i];
    }
    return 0;
}

```

OUTPUT

```

1 #include <iostream>
2
3 using namespace std;
4
5 C:\Users\HP\Downloads\program\2.exe
6 Enter 10 integers:
7 1
8 2
9 3
10 4
11 5
12 6
13 7
14 8
15 9
16 10
17 Enter V: 20
18 Enter index: 8
19 123456782010
20 -----
21 Process exited after 11.41 seconds with return value 0
22 Press any key to continue . . .

```

7. Write a program to handle the command line arguments entered by the user.

INPUT

```

#include <iostream>
using namespace std;

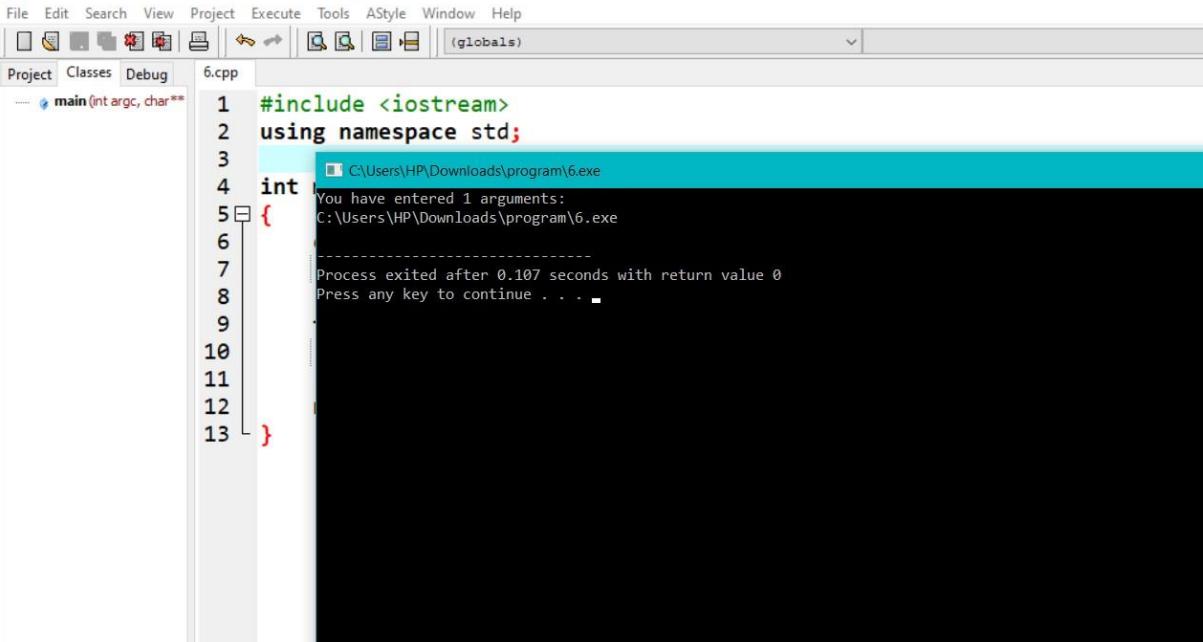
int main(int argc, char** argv)
{
    cout << "You have entered " << argc << " arguments:"
    << "\n";

    for (int i = 0; i < argc; ++i)
        cout << argv[i] << "\n";

    return 0;
}

```

OUTPUT



```
#include <iostream>
using namespace std;
int main()
{
    int argc, argv;
    cout << "You have entered " << argc << " arguments:" << endl;
    for (int i = 0; i < argc; i++)
        cout << argv[i] << endl;
    cout << "Process exited after 0.107 seconds with return value 0" << endl;
}
```

8. Write a program to add 2 matrices.

INPUT

```
#include<iostream>
using namespace std;
int main()
{
    int mat1[2][2], mat2[2][2], i, j, mat3[2][2];
    cout<<"Enter First Matrix: "<<endl;
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            cin>>mat1[i][j];
    }
    cout<<"Enter Second Matrix: "<<endl;
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            cin>>mat2[i][j];
    }
    cout<<"\nAdding the Two Given Matrix...\n";
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            mat3[i][j] = mat1[i][j]+mat2[i][j];
    }
    cout<<"Addition Result of Two Given Matrix is:\n";
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            cout << mat3[i][j] << " ";
        cout << endl;
    }
}
```

```

        cout<<mat3[i][j]<<" ";
        cout<<endl;
    }
    return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
--- main() : int
1 #include<iostream>
2
3 Enter First Matrix:
4 1
5 2
6 3
7 4
8 Enter Second Matrix:
9 5
10 6
11 7
12 8
13
14 Adding the Two Given Matrix...
15 Addition Result of Two Given Matrix is:
16 6 8
17 10 12
18
19
20 -----
21
22

```

9. Write a program to multiply 2 matrices.

INPUT

```

#include<iostream>
using namespace std;
int main()
{
    int mat1[2][2], mat2[2][2], i, j, mat3[2][2];
    cout<<"Enter First Matrix: "<<endl;
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            cin>>mat1[i][j];
    }
    cout<<"Enter Second Matrix: "<<endl;
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            cin>>mat2[i][j];
    }
    cout<<"\nAdding the Two Given Matrix...\n";
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)

```

```

        mat3[i][j] = mat1[i][j]*mat2[i][j];
    }
    cout<<"Addition Result of Two Given Matrix is:\n";
    for(i=0; i<2; i++)
    {
        for(j=0; j<2; j++)
            cout<<mat3[i][j]<<" ";
        cout<<endl;
    }
    return 0;
}

```

OUTPUT

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

Project Classes Debug 6.cpp

main() : int

```

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

```

Enter First Matrix:
1
2
3
4
Enter Second Matrix:
5
6
7
8
Adding the Two Given Matrix...
Addition Result of Two Given Matrix is:
5 12
21 32

Process exited after 6.471 seconds with return value 0
Press any key to continue . . .

10. Write a program to implement sorting an array.

INPUT

```

#include<iostream>
using namespace std;
void selectionSort(int a[], int n)
{
    int i, j, min, temp;
    for (i = 0; i < n - 1; i++)
    {
        min = i;
        for (j = i + 1; j < n; j++)
            if (a[j] < a[min])
                min = j;
        temp = a[i];
        a[i] = a[min];
        a[min] = temp;
    }
}
int main()
{
    int a[] = { 1,3,4,9,2,8,7,6,11,18 };

```

```

int n = sizeof(a)/ sizeof(a[0]);
int i;
cout<<"Given array is:"<<endl;
for (i = 0; i < n; i++)
cout<< a[i] << " ";
cout<<endl;
selectionSort(a, n);
printf("\nSorted array is: \n");
for (i = 0; i < n; i++)
cout<< a[i] << " ";
return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
main() : int
selectionSort(int a[])
Given array is:
1 3 4 9 2 8 7 6 11 18
Sorted array is:
1 2 3 4 6 7 8 9 11 18
Process exited after 0.1579 seconds with return value 0
Press any key to continue . . .

```

11. Write a program in C to calculate the square of the number using inline functions and macros both.

INPUT

```
#include<iostream>
```

```
using namespace std;
```

```
class square
```

```
{
```

```
private:
```

```
int n,r;
```

```
float n1,r1;
```

```
public:
```

```
void input();
```

```
void calc();
void display();

};

inline void square::input()
{
    cout<<"Enter an integer :: ";
    cin>>n;
    cout<<"\nEnter a float no. :: ";
    cin>>n1;

}

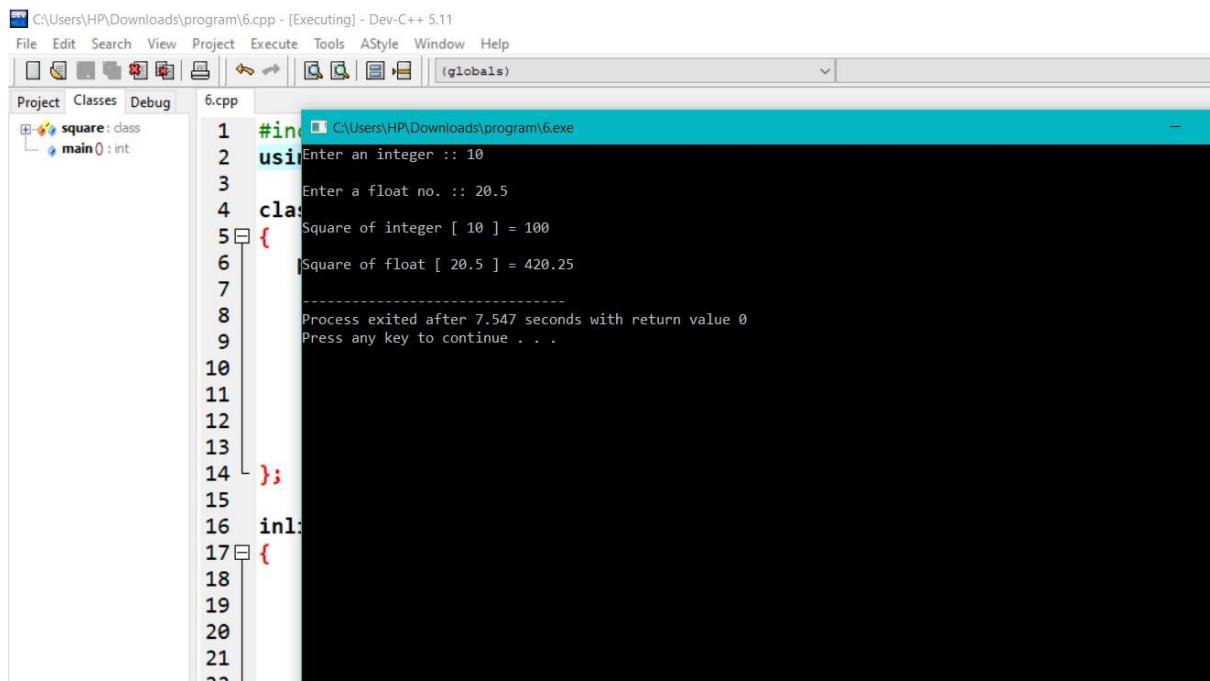
inline void square::calc()
{
    r=n*n;
    r1=n1*n1;
}

inline void square::display()
{
    cout<<"\nSquare of integer [ "<<n<<" ] = "<<r<<"\n";
    cout<<"\nSquare of float [ "<<n1<<" ] = "<<r1<<"\n";
}

int main ()
{
    square s;
    s.input();
    s.calc();
    s.display();
```

```
    return 0;  
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11  
File Edit Search View Project Execute Tools AStyle Window Help  
Project Classes Debug 6.cpp C:\Users\HP\Downloads\program\6.exe  
square: class  
main() : int  
1 #include <iostream>  
2 using namespace std;  
3  
4 class square {  
5 public:  
6     int integer;  
7     float floatNo;  
8     void calculateSquare();  
9 };  
10  
11 void square::calculateSquare()  
12 {  
13     cout << "Enter an integer :: ";  
14     cin >> integer;  
15     cout << "Enter a float no. :: ";  
16     cin >> floatNo;  
17     cout << "Square of integer [ " << integer << " ] = " << integer * integer << endl;  
18     cout << "Square of float [ " << floatNo << " ] = " << floatNo * floatNo << endl;  
19 }  
20  
21 int main()  
22 {  
23     square s;  
24     s.calculateSquare();  
25 }
```

12. Write a program in C to calculate area of all figures using the concept of function overloading.

INPUT

```
#include<iostream>  
using namespace std;  
  
int area(int);  
  
int area(int,int);  
  
float area(float);  
  
float area(float,float);  
  
int main()  
{  
    int s,l,b;  
  
    float r,bs,ht;  
  
    cout<<"Enter side of a square:";  
    cin>>s;  
  
    cout<<"Enter length and breadth of rectangle:";  
    cin>>l>>b;  
  
    cout<<"Enter radius of circle:";
```

```
cin>>r;  
cout<<"Enter base and height of triangle:";  
cin>>bs>>ht;  
cout<<"Area of square is "<<area(s);  
cout<<"\nArea of rectangle is "<<area(l,b);  
cout<<"\nArea of circle is "<<area(r);  
cout<<"\nArea of triangle is "<<area(bs,ht);  
}  
  
int area(int s)  
{  
    return(s*s);  
}  
  
int area(int l,int b)  
{  
    return(l*b);  
}  
  
float area(float r)  
{  
    return(3.14*r*r);  
}  
  
float area(float bs,float ht)  
{  
    return((bs*ht)/2);  
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar contains icons for new file, open, save, cut, copy, paste, find, and others. The project navigation bar shows 'Project', 'Classes', 'Debug', and '6.cpp'. The code editor window displays the following C++ code:

```
1 #include<iostream>
2 using namespace std;
3 int area(int s) : int
4 int area(int l, int b) : int
5 int area(float r) : float
6 int area(float bs, float ht) : float
7 int main() {
8     int s, l, b, r, bs, ht;
9     float area;
10    cout << "Enter side of a square:" << endl;
11    cin >> s;
12    cout << "Enter length and breadth of rectangle:" << endl;
13    cin >> l >> b;
14    cout << "Enter radius of circle:" << endl;
15    cin >> r;
16    cout << "Enter base and height of triangle:" << endl;
17    cin >> bs >> ht;
18    area = s * s;
19    cout << "Area of square is" << area << endl;
20    area = l * b;
21    cout << "Area of rectangle is" << area << endl;
22    area = 3.14 * r * r;
23    cout << "Area of circle is" << area << endl;
24    area = 0.5 * bs * ht;
25    cout << "Area of triangle is" << area << endl;
26    cout << "-----" << endl;
27 }
```

The output window shows the program's execution results:

```
Enter side of a square:6
Enter length and breadth of rectangle:12
Enter radius of circle:24
Enter base and height of triangle:25
Area of square is36
Area of rectangle is 276
Area of circle is 1808.64
Area of triangle is 287.5
-----
Process exited after 15.03 seconds with return value 0
Press any key to continue . . .
```

C++ ASSIGNMENT 5 (STRING HANDLING)

1. Write a program to find the length of string

INPUT

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

int main()
{
    string str = "HELLO WORLD";
    cout << "Name of String :- " << str << endl;
    cout << "The Length of String is :- ";
    cout << str.size();

    return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\14.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. Below the menu is a toolbar with various icons. The main window has tabs for Project, Classes, and Debug, with "14.cpp" selected. In the code editor, line 1 shows "main 0 : int". Lines 2-5 of the code are visible, followed by a dashed line and lines 6-12. The output window shows the program's execution: "Name of String :- HELLO WORLD", "The Length of String is :- 11", "Process exited after 0.1522 seconds with return value 0", and "Press any key to continue . . .".

2. Write a program to display string from backward.

INPUT

```
#include <iostream>
using namespace std ;
int main()
{
    string str;
    char temp;
    cout<<"Enter a string :";
    getline (cin, str);

    int len = str.length();

    for (int i = 0; i < len / 2; i++)
    {
        temp = str[i];
        str[i] = str[len - i - 1];
        str[len - i - 1] = temp;
    }
    cout <<"The Reverse Srtng is : ";
    cout<<str << endl;
    return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ 5.11 IDE interface. The title bar reads "C:\Users\HP\Downloads\program\14.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for file operations like Open, Save, and Build. The global status bar at the bottom says "(globals)". The main window has tabs for Project, Classes, Debug, and 14.cpp. The code editor shows a C++ program with the following code:

```
1 #include <iostream>
2 using namespace std;
3 int main()
4 {
5     string str;
6     cout << "Enter a string : ";
7     cin >> str;
8     cout << "The Reverse String is : " << str << endl;
9 }
10
11
12 }
```

The output window displays the program's execution results:

```
C:\Users\HP\Downloads\program\14.exe
Enter a string : danish
The Reverse String is : hsinad
Process exited after 4.872 seconds with return value 0
Press any key to continue . . .
```

3. Write a program to count number of words in string

INPUT

```
#include<iostream>
#include<string.h>
using namespace std;
int main ()
{
    char str[40];
    int count = 0, i;
    cout << "Enter a string : ";
    gets(str);
    for (i = 0; str[i] != '\0'; i++)
    {
        if (str[i] == ' ')
            count++;
    }
    cout << "Number of words in the string are: " << count + 1;
    return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The left sidebar has tabs for Project, Classes, and Debug, with "6.cpp" selected. The code editor window shows the following C++ code:

```
1 #include<iostream>
2 #include<string.h>
3 U C:\Users\HP\Downloads\program\6.exe
4 i Enter a string : Danish Raza
5 { Number of words in the string are: 2
6 -----
7 Process exited after 10.66 seconds with return value 0
8
9
10
11
12
13
14
15
16
17 }
```

The output window below the code editor shows the program's execution. It prompts the user to enter a string ("Enter a string : Danish Raza"), counts the words ("Number of words in the string are: 2"), and then exits.

4. Write a program to concatenate one string contents to another.

INPUT

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

```
int main()
{
    string s1, s2, result;

    cout << "Enter string s1: ";
    cin >> s1;

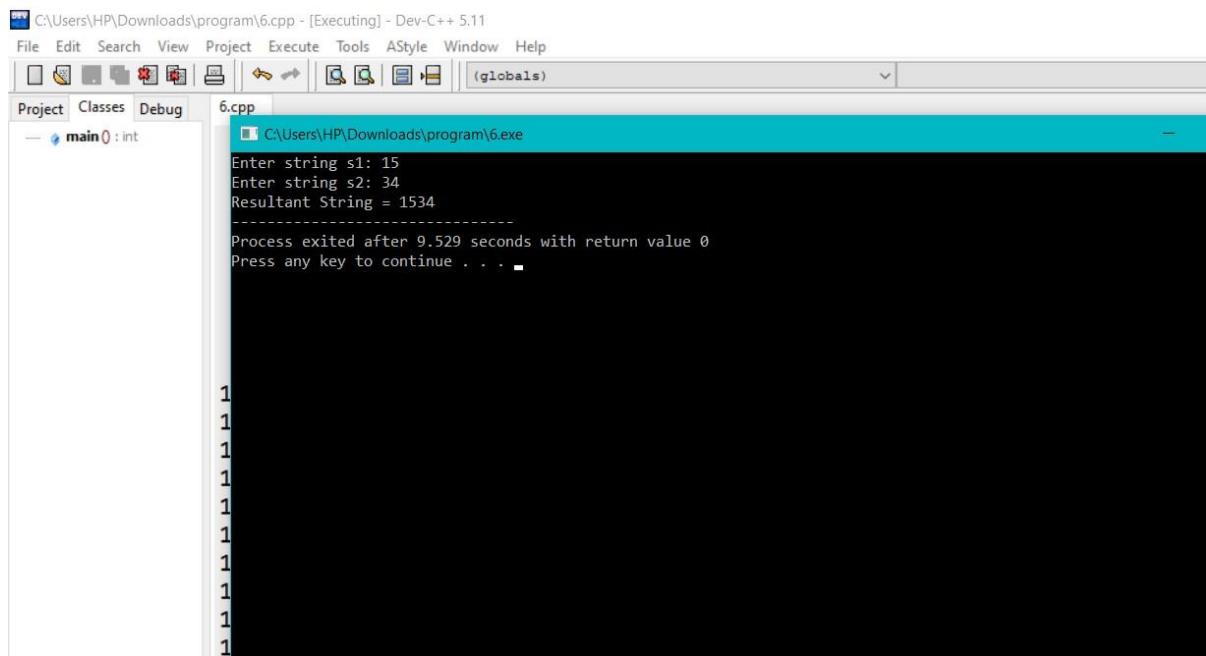
    cout << "Enter string s2: ";
    cin >> s2;

    result = s1 + s2;

    cout << "Resultant String = " << result;
```

```
    return 0;  
}
```

OUTPUT



```
Enter string s1: 15
Enter string s2: 34
Resultant String = 1534
-----
Process exited after 9.529 seconds with return value 0
Press any key to continue . . .

1
1
1
1
1
1
1
1
```

5. Write a program to compare two strings they are exact equal or not.

INPUT

```
#include <iostream>
#include<string>

using namespace std;

int main()
{
    string s1,s2;

    cout<<"Enter First string\n";
    cin>>s1;

    cout<<"Enter Second string\n";
    cin>>s2;

    if(s1.length()!=s2.length())
        cout<<"The given strings are unequal";
    else
```

```

{ int ctr=0;

for(int i=0;i<s1.length();++i)

{ if(s1[i]!=s2[i])

{ ctr=1;

break;

}

if(ctr==0)

cout<<"The given Strings are equal\n";

else

cout<<"The given strings are unequal";

}

return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
--- main() : int
1 #include <iostream>
2 #include <string>
3 using namespace std;
4 int main()
5 {
6     cout << "Enter First string" << endl;
7     string s1;
8     cin >> s1;
9     cout << "Enter Second string" << endl;
10    string s2;
11    cin >> s2;
12    if(s1 == s2)
13    {
14        cout << "The given Strings are equal" << endl;
15    }
16    else
17    {
18        cout << "The given Strings are not equal" << endl;
19    }
20
21    return 0;
22}

```

The given Strings are equal

6. Write a program to check a string is palindrome or not

INPUT

```

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

```

```
int main()
{
    string str, temp;
    int i = 0, j;

    cout << "Enter a string to check for Palindrome: ";
    cin >> str;

    temp = str;

    j = str.length() - 1;

    while (i < j)
    {
        swap(str[i], str[j]);
        i++;
        j--;
    }

    if (temp == str)
    {
        cout << "The string is a palindrome." << endl;
    }
    else
    {
        cout << "The string is not a palindrome." << endl;
    }

    return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
main0 : int
1 #include <iostream>
2 #include <string>
3 us C:\Users\HP\Downloads\program\6.exe
4 Enter a string to check for Palindrome: 15
5 The string is not a palindrome.
6 in
7 -----
8
9
10
11
12
13
14
15
16
17
18
19
20
```

7. Write a program to find a substring within a string. If found display its starting position

INPUT

```
#include<iostream>

using namespace std;

int main()

{
    int i,j,temp;

    char str[100]={"This is a pattern matching"};
    char substr[20]={"pattern"};

    for(i=0;str[i]!='\0';i++)
    {
        j=0;
        if(str[i]==substr[j])
        {
            temp=i+1;
            while(str[i]==substr[j])
            {
                i++;
                j++;
            }
            cout<<"The starting position of the pattern is "<<temp<<endl;
        }
    }
}
```

```

if(substr[j]=='\0')
{
    cout<<"The substring is present in given string at position "<<temp<<"\n";
    exit(0);
}

else
{
    i=temp;
    temp=0;
}

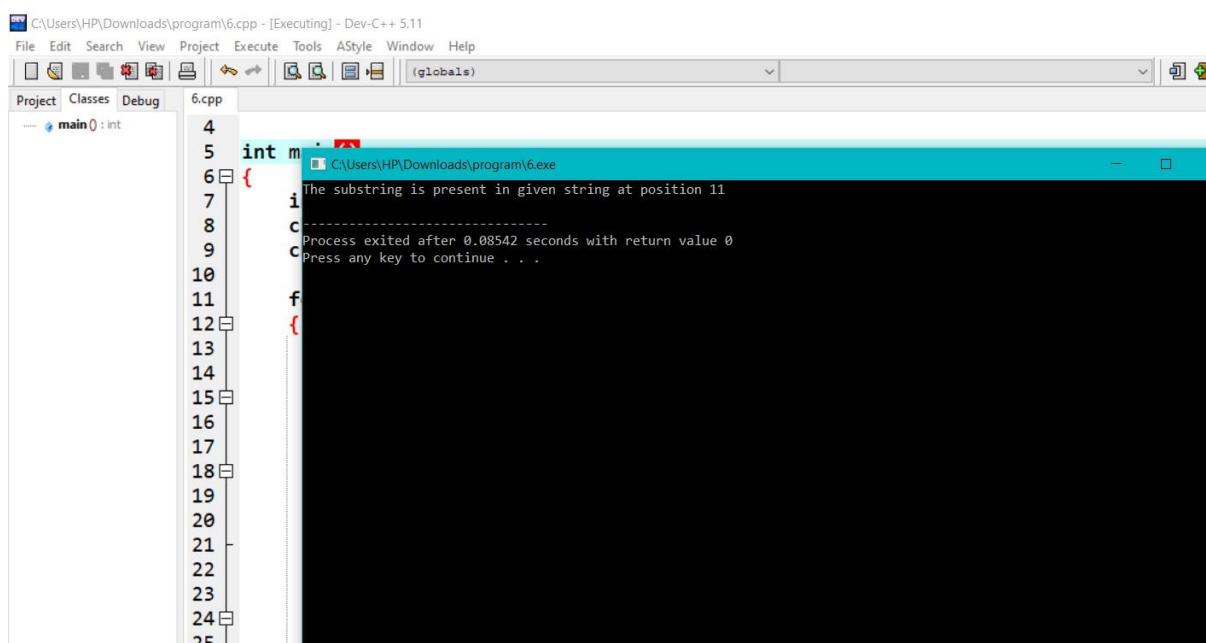
}

if(temp==0)
{
    cout<<"The substring is not present in given string\n";
}

return 0;
}

```

OUTPUT



The screenshot shows the Dev-C++ IDE interface with the following details:

- Title Bar:** C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
- Menu Bar:** File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help
- Toolbar:** Standard icons for file operations like Open, Save, Print, etc.
- Project Explorer:** Shows a single project item: main 0 : int
- Code Editor:** Displays the C++ code above.
- Output Window:** Shows the execution results:
 - Line 6: The substring is present in given string at position 11
 - Line 10: -----
 - Line 11: Process exited after 0.08542 seconds with return value 0
 - Line 12: Press any key to continue . . .

8. Write a program to reverse a string.

INPUT

```
#include<iostream>
#include<string.h>
using namespace std;

int main ()
{
    char str[50], temp;
    int i, j;
    cout << "Enter a string : ";
    gets(str);
    j = strlen(str) - 1;
    for (i = 0; i < j; i++,j--)
    {
        temp = str[i];
        str[i] = str[j];
        str[j] = temp;
    }
    cout << "\nReverse string : " << str;
    return 0;
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface during the execution of a program named '6.cpp'. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The project tree on the left shows a single file 'main() : int'. The code editor window displays the C++ code for reversing a string. The output window shows the program's execution:

```
C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
--- main() : int
1 #include<iostream>
2 #include<string.h>
3 using namespace std;
4 int main()
5 {
6     char str[50], temp;
7     int i, j;
8     cout << "Enter a string : ";
9     gets(str);
10    j = strlen(str) - 1;
11    for (i = 0; i < j; i++,j--)
12    {
13        temp = str[i];
14        str[i] = str[j];
15        str[j] = temp;
16    }
17    cout << "\nReverse string : " << str;
18
19 }
```

The output window shows the user input 'Enter a string : 12345', the reversed string '54321', and the message 'Process exited after 2.763 seconds with return value 0'. The cursor is at the end of the reversed string '54321'.

1. Write a program to convert a string in lowercase

INPUT

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    char X;
```

```
    cout<<"Enter a character:";
```

```
    cin>>X;
```

```
    X=X+32;
```

```
    cout<<"Converted character to Lowercase:";
```

```
    cout<<X;
```

```
    return 0;
```

```
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     char c;
7     cout << "Enter a character: ";
8     cin >> c;
9
10    c = c + 32;
11
12    cout << "Converted character to Lowercase: ";
13    cout << c;
14
15    return 0;
16 }
```

```
Enter a character: d
Converted character to Lowercase:d
Process exited after 3.651 seconds with return value 0
Press any key to continue . . .
```

10. Write a program to convert a string in uppercase.

INPUT

```
#include <iostream>
```

```

using namespace std;

int main()
{
    char X;
    cout<<"Enter a character:";

    cin>>X;
    X=X-32;
    cout<<"Converted character to UPPERCASE:";

    cout<<X;
    return 0;
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The global status bar at the bottom shows '(globals)'. The project navigation bar has tabs for Project, Classes, and Debug, with '6.cpp' selected. The code editor shows the C++ code. The terminal window below shows the program's output:

```

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
main() : int
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     char c;
7     cout << "Enter a character: ";
8     cin >> c;
9     cout << "Converted character to UPPERCASE: ";
10    cout << static_cast<char>(c - 32);
11
12    return 0;
13 }

```

The terminal output shows:

```

Enter a character:d
Converted character to UPPERCASE:D
Process exited after 6.677 seconds with return value 0
Press any key to continue . . .

```

C++ ASSIGNMENT 6 (USING POINTERS)

1. Write a program to find the length of string.

INPUT

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

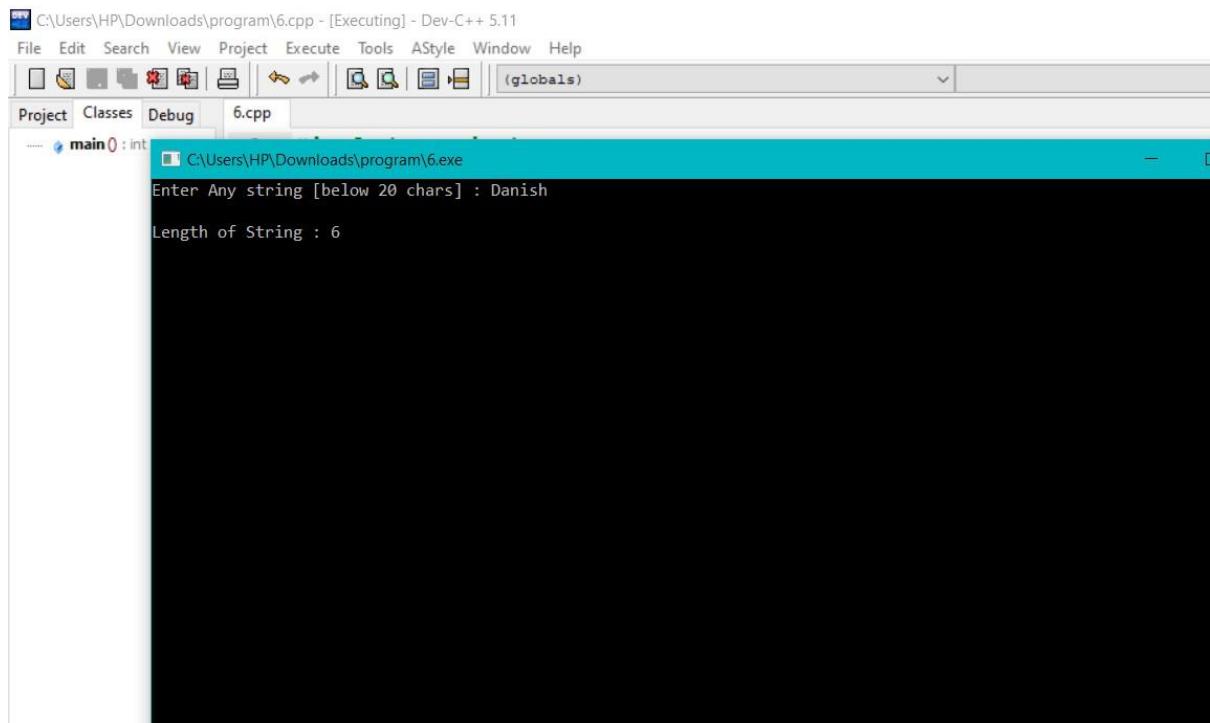
using namespace std;

int main()
{
    char str[20], *pt;
    int i = 0;
    cout << "Enter Any string [below 20 chars] : ";
    cin>>str;

    pt = str;
    while (*pt != '\0') {
        i++;
        pt++;
    }
    cout << "\nLength of String : " << i;

    getch();
    return 0;
}
```

OUTPUT



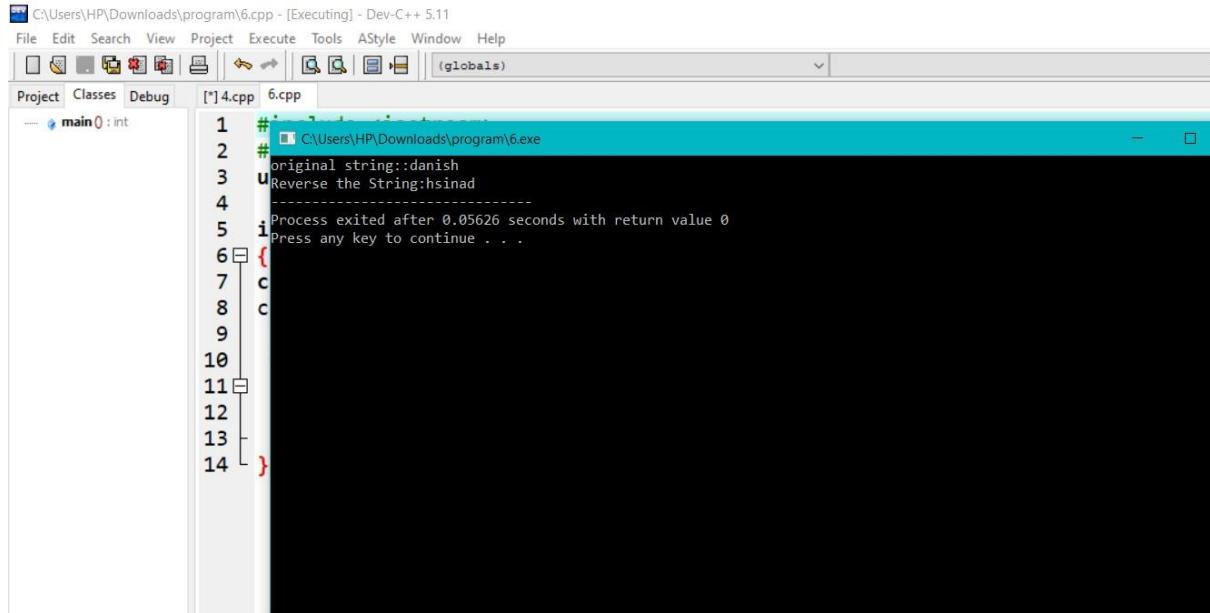
2. Write a program to display string from backward.

INPUT

```
#include <iostream>
#include <string.h>
using namespace std;

int main()
{
    char *str="danish";
    cout<<"original string:"<<str;
    cout<<endl<<"Reverse the String:";
    for(int i=(strlen(str)-1);i>=0;i--)
    {
        cout<<str[i];
    }
}
```

OUTPUT



```
1 #include<iostream>
2 #include<stdio.h>
3 using namespace std;
4
5 int main()
6 {
7     char a[100];
8     int i, count = 1;
9
10    cout << "Enter a string:";
11    gets(a);
12
13    for(i=0; a[i]!='\0'; ++i)
14    {
15        if(a[i]==' ')
16            count++;
17    }
18
19    cout << "Original String: " << a;
20    cout << endl;
21
22    cout << "Reversed String: ";
23    for(i=0; i<count; i++)
24    {
25        cout << a[count-i-1];
26    }
27    cout << endl;
28 }
```

3. Write a program to count number of words in string

INPUT

```
#include<iostream>
```

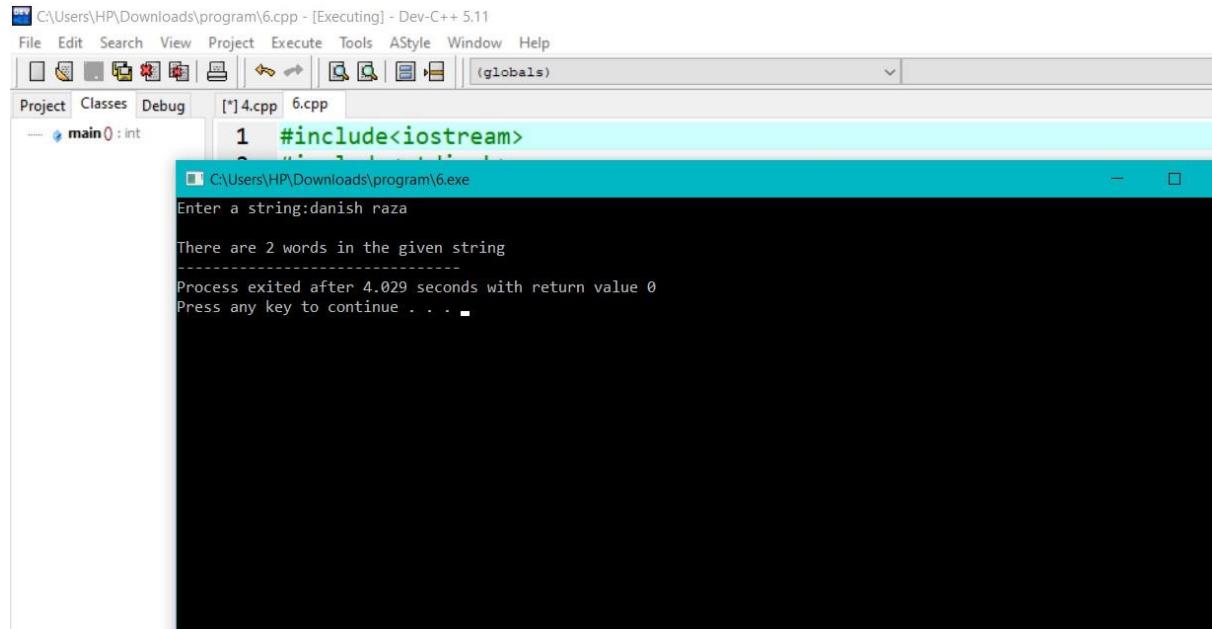
```
#include<stdio.h>
```

```
using namespace std;
```

```
int main()
{
    char a[100];
    int i, count = 1;
    cout << "Enter a string:";
    gets(a);
    for(i=0; a[i]!='\0'; ++i)
    {
        if(a[i]==' ')
            count++;
    }
}
```

```
cout<<"\nThere are "<<count<<" words in the given string";  
  
return 0;  
}
```

OUTPUT



```
C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11  
File Edit Search View Project Execute Tools AStyle Window Help  
Project Classes Debug [*] 4.cpp 6.cpp  
--- main() : int  
1 #include<iostream>  
-----  
C:\Users\HP\Downloads\program\6.exe  
Enter a string:danish raza  
There are 2 words in the given string  
-----  
Process exited after 4.029 seconds with return value 0  
Press any key to continue . . .
```

4. Write a program to concatenate one string contents to another.

INPUT

```
#include <iostream>  
  
#define MAX_SIZE 100  
  
using namespace std;  
  
int main() {  
  
    char str1[MAX_SIZE], str2[MAX_SIZE];  
  
    char * s1 = str1;  
  
    char * s2 = str2;  
  
    cout<<"Enter first string: ";  
    cin>>str1;
```

```

cout<<"Enter second string: ";
cin>>str2;

while(*(++s1));

while(*(s1++) = *(s2++));

cout<<"Concatenated string:"<<str1;

return 0;
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The project tab shows "Project", "Classes", "Debug", "[*] 4.cpp", and "6.cpp". The code editor window displays the following C++ code:

```

1 #include <iostream>
2 #include <conio.h>
3 int main()
4 {
5     char str1[50], str2[50];
6     clrscr();
7     cout << "Enter first string: ";
8     cin >> str1;
9     cout << "Enter second string: ";
10    cin >> str2;
11    cout << "Concatenated string:" << str1 << str2;
12    getch();
13 }

```

The output window shows the execution results:

```

Enter first string: danish
Enter second string: raza
Concatenated string:danishraza
Process exited after 7.749 seconds with return value 0
Press any key to continue . . .

```

5. Write a program to compare two strings they are exact equal or not.

INPUT

```

#include <iostream>
using namespace std;

bool compare(char *str1, char *str2)

```

```

{
    while (*str1 == *str2)
    {
        if (*str1 == '\0' && *str2 == '\0')
            return true;
        str1++;
        str2++;
    }

    return false;
}

int main()
{
    char str1[] = " ";
    cout << "enter a name : ";
    cin >> str1;
    char str2[] = " ";
    cout << "enter 2nd name : ";
    cin >> str2;

    if (compare(str1, str2) == 1)
        cout << str1 << " " << str2 << " are Equal";
    else
        cout << str1 << " " << str2 << " are not Equal";
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for file operations like Open, Save, and Build. The tabs at the top show 'Project', 'Classes', 'Debug', '4.cpp', and '6.cpp'. The code editor displays the following C++ code:

```
if (*str1 == '\0' && *str2 == '\0')  
{  
    cout << "enter a name : Danish"  
    cout << "enter 2nd name : Danish"  
    cout << "Danish Danish are Equal  
-----"  
    cout << "Process exited after 9.087 seconds with return value 0"  
    cout << "Press any key to continue . . ."  
}  
int main()  
{  
}
```

The output window shows the program's execution:

```
C:\Users\HP\Downloads\program\6.exe  
enter a name : Danish  
enter 2nd name : Danish  
Danish Danish are Equal  
-----  
Process exited after 9.087 seconds with return value 0  
Press any key to continue . . .
```

6. Write a program to check a string is palindrome or not.

INPUT

```
#include <iostream>  
#include <string.h>  
using namespace std;  
  
int main()  
{  
    char string1[20];  
    int i, length;  
    int flag = 0;  
  
    cout << "Enter a string: ";  
    cin >> string1;  
  
    length = strlen(string1);  
  
    for(i=0;i < length ;i++)  
    {  
        if(string1[i] != string1[length-i-1])
```

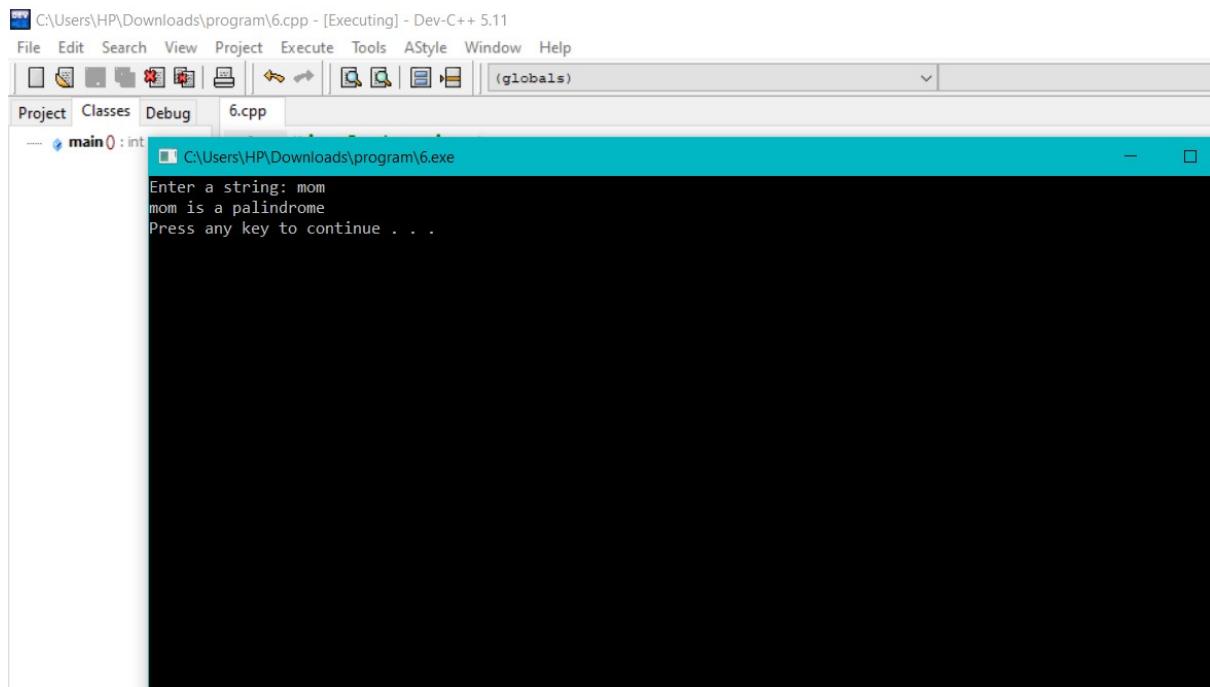
```

    {
        flag = 1;
        break;
    }
}

if (flag)
{
    cout << string1 << " is not a palindrome" << endl;
}
else {
    cout << string1 << " is a palindrome" << endl;
}
system("pause");
return 0;
}

```

OUTPUT



The screenshot shows the Dev-C++ IDE interface. The title bar reads "C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11". The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The global status bar at the bottom says "(globals)". The main window shows the code above. In the terminal window, the output is:

```

main() : int C:\Users\HP\Downloads\program\6.exe
Enter a string: mom
mom is a palindrome
Press any key to continue . . .

```

7. Write a program to find a substring within a string. If found display its starting position

INPUT

```
#include<iostream>
#include <string.h>
using namespace std;
```

```
int main( )
{
    char str1[80], str2[80];

    cout<<"Enter first string: ";
    cin.getline(str1, 80);

    cout<<"Enter second string: ";
    cin.getline(str2, 80);
```

```
int l = 0;
```

```
for(l = 0; str2[l] != '\0'; l++);
```

```
int i, j;
```

```
for(i = 0, j = 0; str1[i] != '\0' && str2[j] != '\0'; i++)
```

```
{
```

```
    if(str1[i] == str2[j])
```

```
{
```

```
    j++;
}
```

```
else
```

```
{
```

```
    j = 0;
}
```

```
}
```

```
if(j == l)
```

```

cout<<"Substring found at position "<< i - j + 1;
else
    cout<<"Substring not found";

return 0;
}

```

OUTPUT

```

C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
--- main() : int
18
19
20
21
22 int i, j;
23
24 Enter first string: Danish
25 Enter second string: ish
26 Substring found at position 4
27 -----
28 Process exited after 24.38 seconds with return value 0
29
30
31
32
33
34
35
36
37
38

```

8. Write a program to reverse a string.

INPUT

```

#include <iostream>
#include<string.h>
using namespace std;

void reverseString(char* str)
{
    int l, i;
    char *begin_ptr, *end_ptr, ch;
    l = strlen(str);

```

```
begin_ptr = str;  
end_ptr = str + l - 1;  
for (i = 0; i < (l - 1) / 2; i++)  
{
```

```
    ch = *end_ptr;  
    *end_ptr = *begin_ptr;  
    *begin_ptr = ch;
```

```
    begin_ptr++;  
    end_ptr--;  
}
```

```
}
```

```
int main()  
{  
  
    char str[100];  
    cout<<"Enter a String : "<<str;  
    cin>>str;  
    reverseString(str);  
    cout<<"Reverse of the string:\n"<< str;
```

```
    return 0;  
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The project navigation bar shows 'Project', 'Classes', 'Debug' and '6.cpp'. The code editor window displays the following C++ code:

```
13 main()
14 {
15     reverseString(char*)
16
17     Enter a String :Danish
18     Reverse of the string:
19     hsniaD
20
21 }
22
23
24 int
25 {
26     char
27     co
28     ci
29     re
30 }
```

The output window shows the program's execution:

```
C:\Users\HP\Downloads\program\6.exe
Enter a String :Danish
Reverse of the string:
hsniaD
```

Process exited after 4.715 seconds with return value 0
Press any key to continue . . .

9. Write a program to convert a string in lowercase.

INPUT

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

void lower_string(string str)
{
    for(int i=0;str[i]!='\0';i++)
    {
        if (str[i] >= 'A' && str[i] <= 'Z')
            str[i] = str[i] + 32;
    }
    cout<<"\n The string in lower case : "<< str;
}

int main()
{
    string str;
    cout<<"Enter the string: ";
```

```
getline(cin,str);
lower_string(str);

return 0;
}
```

OUTPUT

```
C:\Users\HP\Downloads\program\6.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
Project Classes Debug 6.cpp
lower_string(string s)
main() : int

1 #include <iostream>
2 using namespace std;
3
4 void lower(string &s)
5 {
6     for(int i=0; i<s.length(); i++)
7     {
8         if(s[i]>'A' && s[i]<'Z')
9             s[i] = s[i] + 32;
10    }
11    cout<<s;
12 }
13
14 int main()
15 {
16     string str;
17     getline(cin,str);
18     lower(str);
19     cout<<"The string in lower case : "<<str;
20 }

C:\Users\HP\Downloads\program\6.exe
Enter the string: DANISH
The string in lower case : danish
Process exited after 6.298 seconds with return value 0
Press any key to continue . . .
```

10. Write a program to convert a string in uppercase.

INPUT

```
#include <iostream>
#include<string.h>

using namespace std;
```

```
#define MAX 100
int main()
{
    char text[MAX];
    char * st = text;
    cout<<"Enter any string : ";
```

```

gets(text);

while(*st)
{
    *st = (*st > 'a' && *st <= 'z') ? *st-32 : *st;
    st++;
}

cout<<" to convert lower case to Uppercase string :"<<text;
return 0;
}

```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, and Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The project manager shows a single file named '6.cpp'. The code editor contains the following code:

```

1 #include <iostream>
2 #include<string.h>
3 using namespace std;
4

```

The terminal window displays the following output:

```

C:\Users\HP\Downloads\program\6.exe
Enter any string : mummy
to convert lower case to Uppercase string :MUMMY
-----
Process exited after 15.48 seconds with return value 0
Press any key to continue . . .
1
1
1
1
1
1
1
1
1
2
2

```

ADDITIONAL PROGRAM

- Write a program to reverse a sentence

INPUT

```

#include<iostream>
#include<string>
using namespace std;
int main()

```

```
{  
    string str="Its A programming";  
    int i;  
    cout<<"Printing string in reverse\n";  
    for(i = str.length() -1; i >= 0; i--)  
    {  
        cout<<str[i];  
    }  
    return 0;  
}
```

OUTPUT

The screenshot shows the Dev-C++ IDE interface. The menu bar includes File, View, Project, Execute, Tools, AStyle, Window, Help. The toolbar has icons for New, Open, Save, Run, Stop, and others. The tabs at the top show 6.cpp and 7.cpp. The code editor window displays the following C++ code:

```
#include<iostream>
#include<string>
using namespace std;
int main()
{
    string str;
    int i;
    cout<<"Printing string in reverse";
    for(i = str.length() -1; i >= 0; i--)
    {
        cout<<str[i];
    }
    return 0;
}
```

The output window shows the execution results:

```
C:\Users\HP\Downloads\program\6.exe
Printing string in reverse
gnimmargin A stI
Process exited after 0.1767 seconds with return value 0
Press any key to continue . . .
```