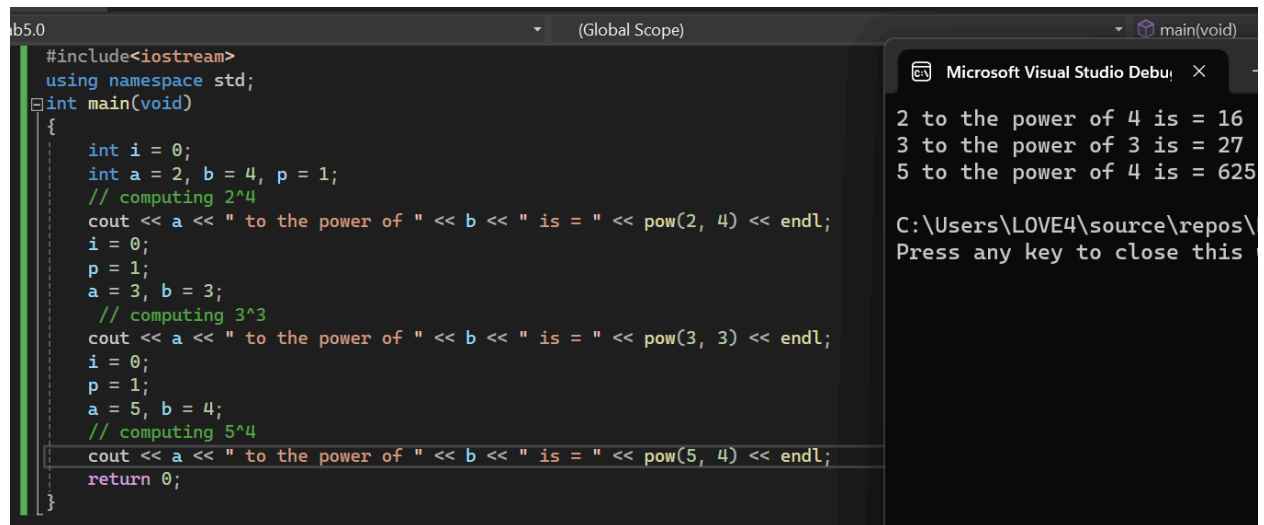


Example 5.1



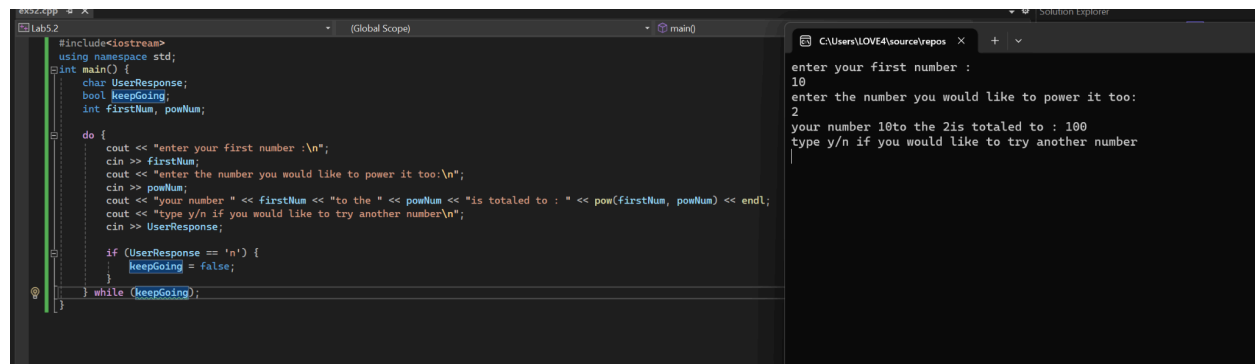
```
#include<iostream>
using namespace std;
int main(void)
{
    int i = 0;
    int a = 2, b = 4, p = 1;
    // computing 2^4
    cout << a << " to the power of " << b << " is = " << pow(2, 4) << endl;
    i = 0;
    p = 1;
    a = 3, b = 3;
    // computing 3^3
    cout << a << " to the power of " << b << " is = " << pow(3, 3) << endl;
    i = 0;
    p = 1;
    a = 5, b = 4;
    // computing 5^4
    cout << a << " to the power of " << b << " is = " << pow(5, 4) << endl;
    return 0;
}
```

Microsoft Visual Studio Debug Console Output:

```
2 to the power of 4 is = 16
3 to the power of 3 is = 27
5 to the power of 4 is = 625
C:\Users\LOVE4\source\repos\
Press any key to close this
```

Could have used the variables but completely forgot about them till after and you could use a while loop to go through all of this

Example 5.2



```
#include<iostream>
using namespace std;
int main() {
    char UserResponse;
    bool keepGoing;
    int firstNum, powNum;

    do {
        cout << "enter your first number :\n";
        cin >> firstNum;
        cout << "enter the number you would like to power it too:\n";
        cin >> powNum;
        cout << "your number " << firstNum << "to the " << powNum << "is totaled to : " << pow(firstNum, powNum) << endl;
        cout << "type y/n if you would like to try another number\n";
        cin >> UserResponse;

        if (UserResponse == 'n') {
            keepGoing = false;
        }
    } while (keepGoing);
}
```

Debug Console Output:

```
enter your first number :
10
enter the number you would like to power it too:
2
your number 10to the 2is totaled to : 100
type y/n if you would like to try another number
```

Now we used the for loops

Number	Ceil(ceil)	Floor	Round	
55.9	56	54	56	
25.3	26	24	25	
-13.2	-14	-12	-13	
-31.8	-32	-30	-32	

Example 5.4

The screenshot shows the Visual Studio IDE with a C++ file named Lab5.4. The code includes `<iostream>` and `<cmath>`, uses the `std` namespace, and defines a `main` function. Inside `main`, it declares `t_in_fah` and `t_in_cel` as integers. It prompts the user to enter a temperature in Fahrenheit, reads the input (42), and calculates the Celsius temperature using the formula $C = (F - 32) \times \frac{5}{9}$. The output shows the Celsius temperature as 5. The debug console on the right shows the program's execution, including the prompt, input, and output.

```
#include<iostream>
using namespace std;
int main()
{
    int t_in_fah, t_in_cel; //Notice that we declared these two as integers
    cout << "Enter a temperature in Fahrenheit \n";
    cin >> t_in_fah;
    t_in_cel = static_cast<double>(5.00 / 9.00) * (t_in_fah - 32);
    cout << "The temperature in Celsius is: " << t_in_cel << endl;
    return 0;
}
```

Microsoft Visual Studio Debug Console:

```
Enter a temperature in Fahrenheit
42
The temperature in Celsius is: 5

C:\Users\LOVE4\source\repos\Lab5.4\x64\Debug\Lab5.4.exe (process 15908) exited with code 0.
To automatically close the console when debugging stops, please select OK on the dialog box that appears.
Press any key to close this window . . .
```

Example 5.5

The screenshot shows the Visual Studio IDE with a C++ file named Lab5.5. The code includes `<iostream>` and `<cmath>`, uses the `std` namespace, and defines a `main` function. It declares `r` and `h` as doubles. It prompts the user to enter the radius and height of a cylinder in cm. It then calls `cross_area(r)` and `side_area(r, h)` functions. The output shows the cross section area as 3.89556 inch-sqr and the side area as 19.4778 inch-sqr. The debug console on the right shows the program's execution, including the prompts, input, and output.

```
#include<iostream>
#include<cmath>
using namespace std;
//Let's declare first any global constant, if any required
// This variable is defined globally, i.e. it is known to all functions in this program as PI
// To declare a global constant you must write it outside the main() function
const double PI = 3.14159;
//Now we declare any programmer defined function
double cross_area(double r); // Function prototype for function cross_area
double side_area(double r, double h); // Function prototype for function Side_area
// Start defining the main function
int main(void)
{
    double r, h; //variables local to the main function
    cout << "Enter the radius and the height of the cylinder in Cm <Enter> ";
    cin >> r >> h;
    cout << endl;
    cout << "Before I do any computation or call any function, I want to let you know that \n";
    cout << "you have entered r = " << r << " and h = " << h << ".\n" << endl;
    cout << "I am planning to use inch, thus in the first function, I will convert r, and " << endl;
    cout << "in the second one I will convert h \n";
    cout << "The cross section area of the cylinder is " << cross_area(r) << " inch-sqr" << endl;
    cout << "The side area of the cylinder is " << side_area(r, h) << " inch-sqr \n\n";

    return 0;
}
// Definition of all programmer defined functions
double cross_area(double r)
{
    //Cross section area includes the disks at the bottom and the top
    r = r * 0.3937; // converting r to inch
    return 2 * PI * pow(r, 2);
}
double side_area(double r, double h)
{
    double area; //variable local to side_area function
    h = h * 0.3937; // converting h to inch
    r = r * 0.3937;
    area = 2 * PI * r * h;
    return area;
}
```

Microsoft Visual Studio Debug Console:

```
Enter the radius and the height of the cylinder in Cm <Enter>
2 10

Before I do any computation or call any function, I want to let you know that
you have entered r = 2 and h = 10.
I am planning to use inch, thus in the first function, I will convert r, and
in the second one I will convert h
The cross section area of the cylinder is 3.89556 inch-sqr
The side area of the cylinder is 19.4778 inch-sqr

C:\Users\LOVE4\source\repos\Lab5.5\x64\Debug\Lab5.5.exe (process 15908) exited with code 0.
Press any key to close this window . . .
```

It wasnt working was because the radius was not being converted

Example 5.6

The image shows a Visual Studio Code editor with a C++ file named `ex5.6.cpp` and its debug output. The code defines two functions, `cross_area` and `side_area`, to calculate the area of a cylinder. The `main` function prompts the user for the radius `r` and height `h` in centimeters, converts them to inches, and then calculates and displays the cross-section area, side area, and total area.

```
#include<iostream>
#include<cmath>
using namespace std;
//Let's declare first any global constant, if any required
// This variable is defined globally, i.e. it is known to all functions in this program as PI
// To declare a global constant you must write it outside the main() function
const double PI = 3.14159;
//Now we declare any programmer defined function
double cross_area(double r); // Function prototype for function cross_area
double side_area(double r, double h); // Function prototype for function Side_area
// Start defining the main function
int main(void)
{
    double r, h; //variables local to the main function
    cout << "Enter the radius and the height of the cylinder in Cm <Enter> ";
    cin >> r >> h;
    cout << endl;
    cout << "Before I do any computation or call any function, I want to let you know that \n";
    cout << "you have entered r = " << r << " and h = " << h << " \n";
    cout << "I am planning to use inch, thus in the first function, I will convert r, and " <<
    cout << "in the second one I will convert h \n";
    cout << "The cross section area of the cylinder is " << cross_area(r) << " inch-sqr" << endl;
    cout << "The side area of the cylinder is " << side_area(r, h) << " inch-sqr \n\n";
    cout << "The Total Area is " << cross_area(r) + side_area(r, h);
    return 0;
}
// Definition of all programmer defined functions
double cross_area(double r)
{
    //Cross section area includes the disks at the bottom and the top
    r = r * 0.3937; // converting r to inch
    return 2 * PI * pow(r, 2);
}
double side_area(double r, double h)
{
    double area; //variable local to side_area function
    h = h * 0.3937; // converting h to inch
    r = r * 0.3937;
    area = 2 * PI * r * h;
    return area;
}
```

The debug output shows the program's execution with the input `2 10`. It displays the conversion of centimeters to inches and the resulting areas: cross-section area of 3.89556 inch-sqr, side area of 19.4778 inch-sqr, and a total area of 23.3734. The program exits with code 0.

```
Enter the radius and the height of the cylinder in Cm <Enter>
2 10

Before I do any computation or call any function, I want to let you know that
you have entered r = 2 and h = 10.
I am planning to use inch, thus in the first function, I will convert r, and
in the second one I will convert h
The cross section area of the cylinder is 3.89556 inch-sqr
The side area of the cylinder is 19.4778 inch-sqr

The Total Area is 23.3734
C:\Users\LOVE4\source\repos\Lab5.6\x64\Debug\Lab5.6.exe (process 19588) exited with code 0.
Press any key to close this window . . .
```