



## C++ Assignments | Fundamentals of Programming -1 | Week2

Take 2 integers input and print the greatest of them

Input 1: a = 5 b =

7

Output 1: second number 7 is the largest.

Input 2: a = 12 b = 1

Output 2 : first number 12 is the largest.

The image is a screenshot of a Visual Studio Code editor window. The main editor area shows a C++ file named 'assignment3.cpp'. The code defines a 'main' function that takes two integers, 'a' and 'b', as input. It uses 'cout' and 'cin' to interact with the user. The logic compares 'a' and 'b' using 'if', 'else if', and 'else' statements to determine which is larger or if they are equal. The output messages are: "first number <a> is the largest.", "second number <b> is the largest.", and "Both numbers are equal.". Below the code editor, the 'TERMINAL' panel is active, showing the command to compile and run the program: 'g++ assignment3.cpp -o assignment3 && ./assignment3'. The terminal output shows the user entering '7' for the first number and '12' for the second number, resulting in the output: 'second number 12 is the largest.'. The status bar at the bottom indicates the file is at line 22, column 14, using UTF-8 encoding and LF line endings.

2. Given the radius of the circle, predict whether numerically the area of this circle is larger than the circumference or not.

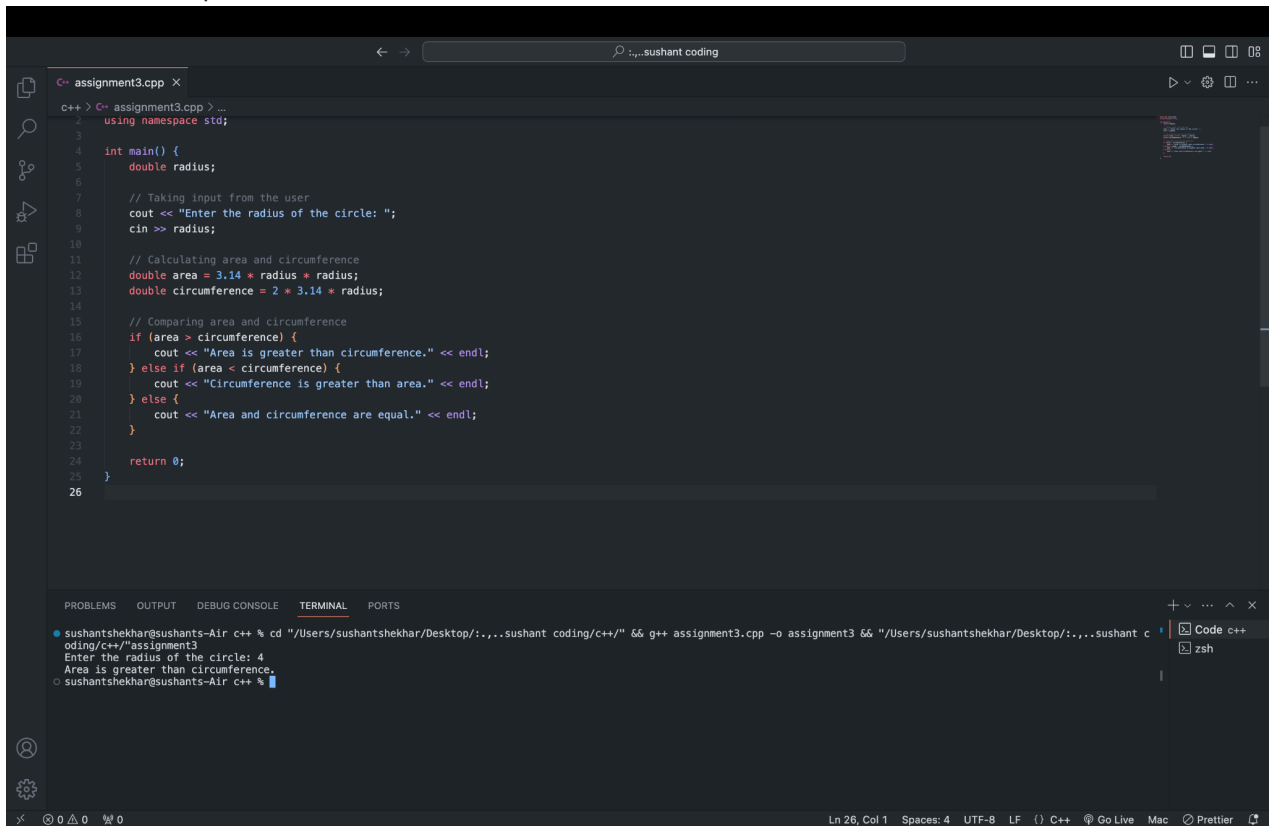
Input 1: radius = 4

Output 1: Area is greater than circumference.

Explanation:  $\text{area} = 3.14 * 4 * 4 = 50.24 \text{ unit}^2$

$\text{Perimeter} = 2 * 3.14 * 4 = 25.12 \text{ unit}$

Therefore  $\text{area} > \text{perimeter}$ .



```
1 // assignment3.cpp
2 using namespace std;
3
4 int main() {
5     double radius;
6
7     // Taking input from the user
8     cout << "Enter the radius of the circle: ";
9     cin >> radius;
10
11    // Calculating area and circumference
12    double area = 3.14 * radius * radius;
13    double circumference = 2 * 3.14 * radius;
14
15    // Comparing area and circumference
16    if (area > circumference) {
17        cout << "Area is greater than circumference." << endl;
18    } else if (area < circumference) {
19        cout << "Circumference is greater than area." << endl;
20    } else {
21        cout << "Area and circumference are equal." << endl;
22    }
23
24    return 0;
25 }
26
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

• sushantshekh@Sushants-Air c++ % cd "/Users/sushantshekh/Desktop/...sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/sushantshekh/Desktop/...sushant c  
oding/c++/"assignment3  
Enter the radius of the circle: 4  
Area is greater than circumference.  
○ sushantshekh@Sushants-Air c++ %

3. Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not. (Considering leap year occurs after every 4 years)

Input 1: 1976

Output: yes

Input 2: 2003

Output: no

The screenshot shows a C++ IDE with a file named `assignment3.cpp`. The code is as follows:

```
c++ > C++ assignment3.cpp > main()
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int year;
6
7     // Taking input from the user
8     cout << "Enter the year: ";
9     cin >> year;
10
11    // Checking if the year is a leap year
12    if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
13        cout << "Yes, " << year << " is a leap year." << endl;
14    } else {
15        cout << "No, " << year << " is not a leap year." << endl;
16    }
17
18    return 0;
19 }
```

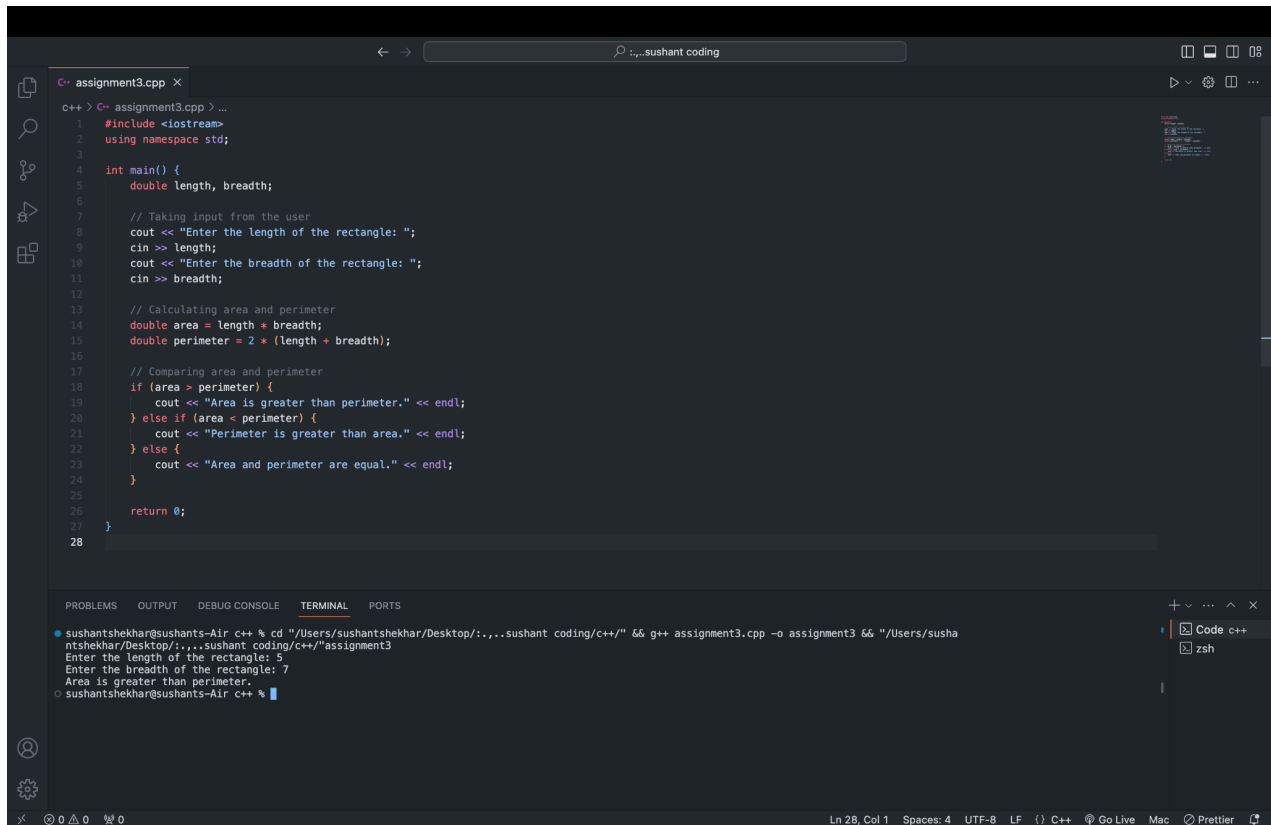
The terminal output shows the program being compiled and executed with the input year 1976:

```
sushantshekharsushants-Air c++ % cd "/Users/sushantshekharsushants/Desktop/...sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/sushantshekharsushants/Desktop/...sushant coding/c++/"assignment3
Enter the year: 1976
Yes, 1976 is a leap year.
sushantshekharsushants-Air c++ %
```

4. Given the length and breadth of a rectangle, write a program to find whether numerically the area of the rectangle is greater than its perimeter.

Input 1: length = 5 breadth = 7

Output 1: Area is greater than perimeter.



```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     double length, breadth;
6
7     // Taking input from the user
8     cout << "Enter the length of the rectangle: ";
9     cin >> length;
10    cout << "Enter the breadth of the rectangle: ";
11    cin >> breadth;
12
13    // Calculating area and perimeter
14    double area = length * breadth;
15    double perimeter = 2 * (length + breadth);
16
17    // Comparing area and perimeter
18    if (area > perimeter) {
19        cout << "Area is greater than perimeter." << endl;
20    } else if (area < perimeter) {
21        cout << "Perimeter is greater than area." << endl;
22    } else {
23        cout << "Area and perimeter are equal." << endl;
24    }
25
26    return 0;
27 }
28
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
sushantshekharsushants-Air c++ % cd "/Users/sushantshekharsushants/Desktop/...sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/sushantshekharsushants/Desktop/...sushant coding/c++/"assignment3
Enter the length of the rectangle: 5
Enter the breadth of the rectangle: 7
Area is greater than perimeter.
sushantshekharsushants-Air c++ %
```

5. Write a program to input sides of a triangle and check whether a triangle is equilateral, scalene or isosceles triangle.

Input : side1 = 5 side2 = 4 side3 = 4

Output: This is an Isosceles triangle.

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     double side1, side2, side3;
6
7     // Taking input from the user
8     cout << "Enter the length of side1: ";
9     cin >> side1;
10    cout << "Enter the length of side2: ";
11    cin >> side2;
12    cout << "Enter the length of side3: ";
13    cin >> side3;
14
15    // Checking the type of triangle
16    if (side1 == side2 && side2 == side3) {
17        cout << "This is an Equilateral triangle." << endl;
18    } else if (side1 == side2 || side1 == side3 || side2 == side3) {
19        cout << "This is an Isosceles triangle." << endl;
20    } else {
21        cout << "This is a Scalene triangle." << endl;
22    }
23
24    return 0;
25 }
26
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

sushantshekharsushants-Air c++ % cd "/Users/sushantshekharsushants/Desktop/...sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/sushantshekharsushants/Desktop/...sushant coding/c++/"assignment3

Enter the length of side1: 5  
Enter the length of side2: 4  
Enter the length of side3: 4  
This is an Isosceles triangle.

sushantshekharsushants-Air c++ %

6. If the marks of A, B and C are input through the keyboard, write a program to determine the student scoring the least marks.

Input 1: A = 23 , B = 34 , C = 71

Output : 'A' has the least marks.

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int A, B, C;
6
7     // Taking input from the user
8     cout << "Enter the marks of student A: ";
9     cin >> A;
10    cout << "Enter the marks of student B: ";
11    cin >> B;
12    cout << "Enter the marks of student C: ";
13    cin >> C;
14
15    // Finding the student with the least marks
16    if (A <= B && A <= C) {
17        cout << "'A' has the least marks." << endl;
18    } else if (B <= A && B <= C) {
19        cout << "'B' has the least marks." << endl;
20    } else {
21        cout << "'C' has the least marks." << endl;
22    }
23
24    return 0;
25 }
26
27
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

sushantshekhars@sushants-Air c++ % cd "/Users/sushantshekhars/Desktop/...sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/sushantshekhars/Desktop/...sushant coding/c++/"assignment3  
Enter the marks of student A: 23  
Enter the marks of student B: 34  
Enter the marks of student C: 71  
'A' has the least marks.

7. Given a point (x, y), write a program to find out if it lies on the x-axis, y-axis or at the origin, viz. (0, 0).

Input 1: 2 0

Output 1: the point lies on the x - axis.

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     int x, y;
6
7     // Taking input from the user
8     cout << "Enter the coordinates of the point (x y): ";
9     cin >> x >> y;
10
11     // Checking the position of the point
12     if (x == 0 && y == 0) {
13         cout << "The point lies at the origin." << endl;
14     } else if (x == 0) {
15         cout << "The point lies on the y-axis." << endl;
16     } else if (y == 0) {
17         cout << "The point lies on the x-axis." << endl;
18     } else {
19         cout << "The point does not lie on the x-axis, y-axis, or at the origin." << endl;
20     }
21
22     return 0;
23 }
24
25
26
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
sushantshekharsushants-Air c++ % cd "/Users/sushantshekhkar/Desktop/....sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/susha
ntshekhkar/Desktop/....sushant coding/c++/"assignment3
Enter the coordinates of the point (x y): 2 0
The point lies on the x-axis.
sushantshekharsushants-Air c++ %
```

Given three points  $(x_1, y_1)$ ,  $(x_2, y_2)$  and  $(x_3, y_3)$ , write a program to check if all the three points fall on one straight line.

Input 1:  $x_1 = 1$  ,  $y_1 = 2$  ,  $x_2 = 2$  ,  $y_2 = 3$  ,  $x_3 = 3$  ,  $y_3 = 4$

Output 1: All 3 points lie on the same line.

The screenshot shows a C++ IDE with a file explorer on the left containing a project named 'assignment3'. The main editor displays 'assignment3.cpp' with the following code:

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     double x1, y1, x2, y2, x3, y3;
6
7     // Taking input from the user
8     cout << "Enter the coordinates of point 1 (x1 y1): ";
9     cin >> x1 >> y1;
10    cout << "Enter the coordinates of point 2 (x2 y2): ";
11    cin >> x2 >> y2;
12    cout << "Enter the coordinates of point 3 (x3 y3): ";
13    cin >> x3 >> y3;
14
15    // Calculating slopes between pairs of points
16    double slope1 = (y2 - y1) / (x2 - x1);
17    double slope2 = (y3 - y2) / (x3 - x2);
18
19    // Checking if slopes are equal
20    if (slope1 == slope2) {
21        cout << "All 3 points lie on the same line." << endl;
22    } else {
23        cout << "The points do not lie on the same line." << endl;
24    }
25
26    return 0;
27 }
```

The bottom panel shows the terminal output:

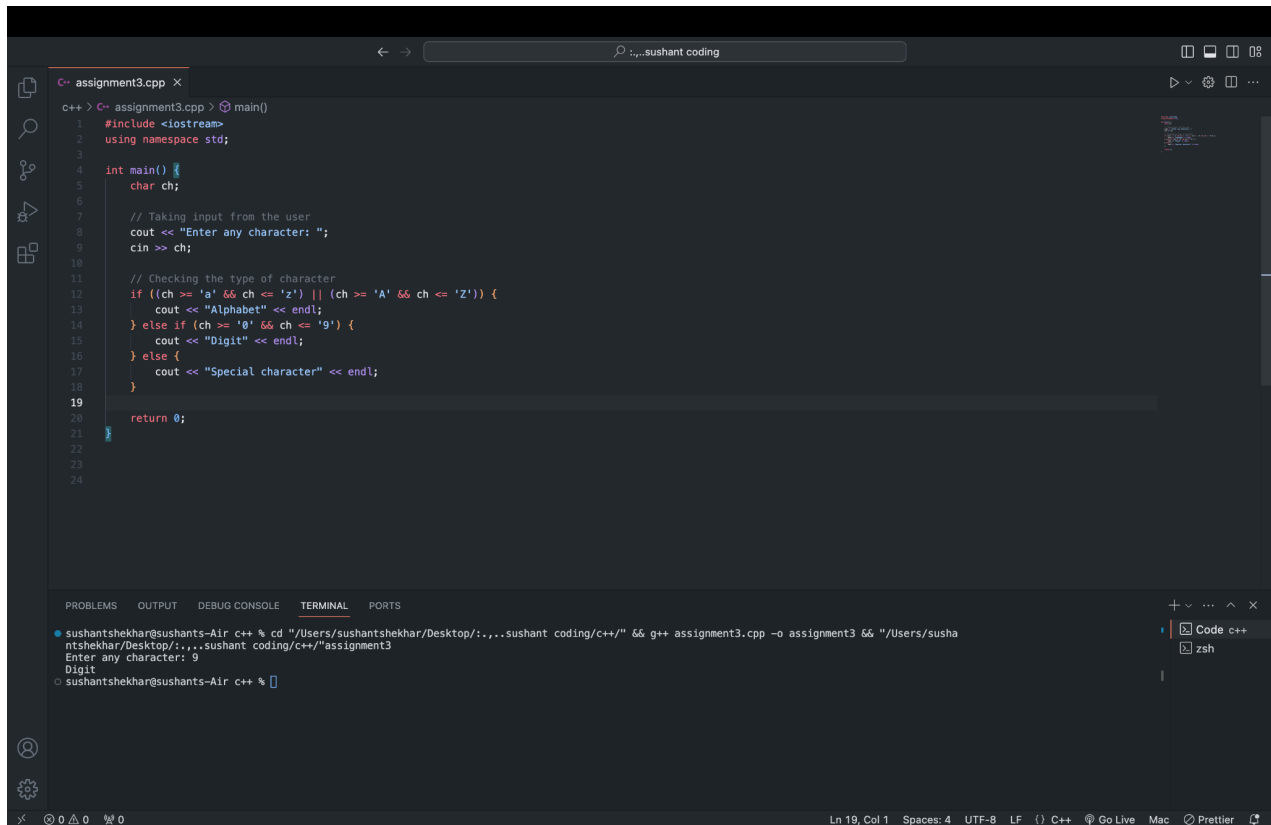
```
sushantshekhars@sushants-Air c++ % cd "/Users/sushantshekhars/Desktop/....sushant coding/c++/" && g++ assignment3.cpp -o assignment3 && "/Users/sushantshekhars/Desktop/....sushant coding/c++/"assignment3
Enter the coordinates of point 1 (x1 y1): 1 2
Enter the coordinates of point 2 (x2 y2): 2 3
Enter the coordinates of point 3 (x3 y3): 3 4
All 3 points lie on the same line.
```

Write a C++ program to input any character and check whether it is the alphabet, digit or special character.

Input 1: ch = '9'

Output 1: digit





The screenshot shows a VS Code editor with a C++ file named `assignment3.cpp`. The code is as follows:

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     char ch;
6
7     // Taking input from the user
8     cout << "Enter any character: ";
9     cin >> ch;
10
11     // Checking the type of character
12     if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
13         cout << "Alphabet" << endl;
14     } else if (ch >= '0' && ch <= '9') {
15         cout << "Digit" << endl;
16     } else {
17         cout << "Special character" << endl;
18     }
19
20     return 0;
21 }
```

The terminal output shows the program being executed with the command `g++ assignment3.cpp -o assignment3`. The user entered the character `9`, and the program outputted `Digit`.

10. Predict the output of the below code:

```
#include<iostream>
```

```
using namespace std;
```

```
int main() {
```

```
int a = 500, b, c;
```

```
if (a >= 400)
```

```
b = 300;
```

```
c = 200;
```

```
cout << "value of b and c are respectively " << b << " and " << c; return 0;
```

```
} output: value of b and c are respectively 300 and 200
```

