| Activity No. 1 | |
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| **REVIEW OF C++ PROGRAMMING** | |
| **Course Code:** CPE010 | **Program:** Computer Engineering |
| **Course Title:** Data Structures and Algorithms | **Date Performed: SEPTEMBER 11, 2024** |
| **Section: CPE21S1** | **Date Submitted:** |
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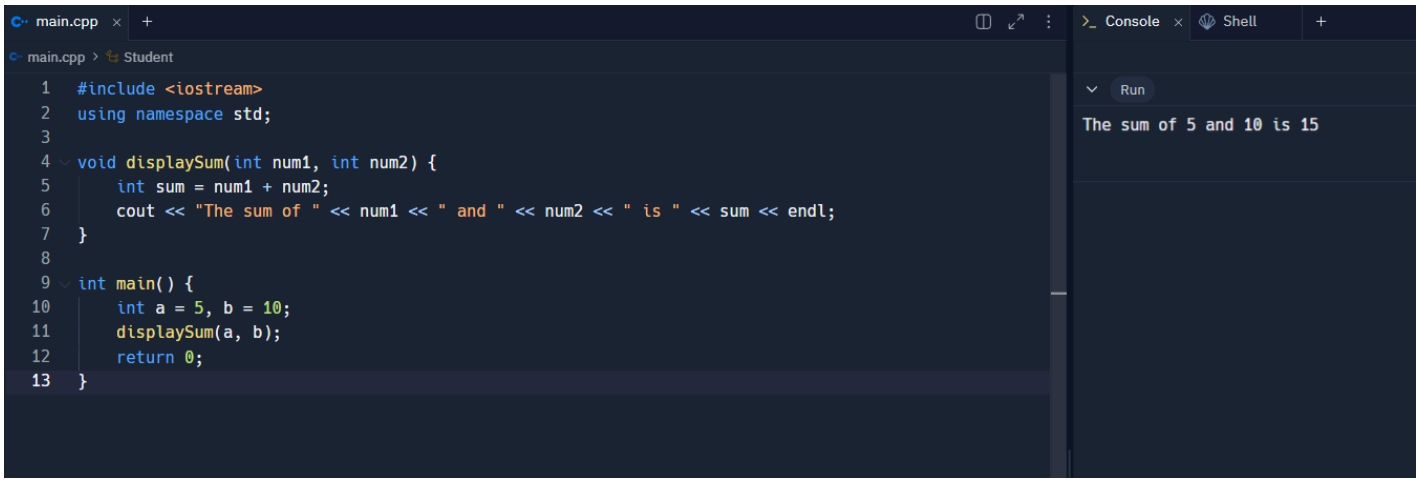
## 6. Output




main.cpp

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

bool logicalOperations(bool val1, bool val2) {
    cout << "Logical AND: " << (val1 && val2) << endl;
    cout << "Logical OR: " << (val1 || val2) << endl;
    cout << "Logical NOT (val1): " << (!val1) << endl;
    cout << "Logical NOT (val2): " << (!val2) << endl;
    cout << "Logical XOR: " << (val1 ^ val2) << endl;
    return true;
}

int main() {
    bool val1 = true, val2 = false;
    if (logicalOperations(val1, val2)) {
        cout << "Logical operations were successful" << endl;
    }
    return 0;
}
```

Console / Shell

Run

```
Logical AND: 0
Logical OR: 1
Logical NOT (val1): 0
Logical NOT (val2): 1
Logical XOR: 1
Logical operations were successful
```

## 7. Supplementary Activity

VoidFunction CPU/RAM LIMITED ▶ Run

main.cpp

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

int main() {
    int a = 5, b = 10, temp;
    cout << "Before swapping: a = " << a << ", b = " << b << endl;
    temp = a;
    a = b;
    b = temp;
    cout << "After swapping: a = " << a << ", b = " << b << endl;
    return 0;
}
```

Console / Shell

Run

```
Before swapping: a = 5, b = 10
After swapping: a = 10, b = 5
```

main.cpp

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

float kelvinToFahrenheit(float kelvin) {
    return (9.0 / 5) * (kelvin - 273.15) + 32;
}

int main() {
    float kelvin;
    cout << "Enter temperature in Kelvin: ";
    cin >> kelvin;
    cout << "Temperature in Fahrenheit: " << kelvinToFahrenheit(kelvin) << endl;
    return 0;
}
```

Console / Shell

Run

```
Enter temperature in Kelvin: 25
Temperature in Fahrenheit: -414.67
```

main.cpp

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

double distance(double x1, double y1, double x2, double y2) {
    return sqrt(pow(x2 - x1, 2) + pow(y2 - y1, 2));
}

int main() {
    double x1, y1, x2, y2;
    cout << "Enter coordinates of the first point (x1 y1): ";
    cin >> x1 >> y1;
    cout << "Enter coordinates of the second point (x2 y2): ";
    cin >> x2 >> y2;
    cout << "Distance between the points: " << distance(x1, y1, x2, y2) << endl;
    return 0;
}
```

Console / Shell

```
Enter coordinates of the first point (x1 y1): 34 56
Enter coordinates of the second point (x2 y2): 7  8
Distance between the points: 55.0727
```

main.cpp

```cpp
#include <iostream>
#include <cmath>
using namespace std;
class Triangle{
private:
double totalAngle, angleA, angleB, angleC;
public:
Triangle(double A, double B, double C);
void setAngles(double A, double B, double C);
const bool validateTriangle();
};

float areaOfTriangle(float a, float b, float c) {
    float s = (a + b + c) / 2;
    return sqrt(s * (s - a) * (s - b) * (s - c));
}

Triangle::Triangle(double A, double B, double C) {
    angleA = A;
    angleB = B;
    angleC = C;
    totalAngle = A+B+C;
}
void Triangle::setAngles(double A, double B, double C) {
    angleA = A;
    angleB = B;
    angleC = C;
    totalAngle = A+B+C;
}
const bool Triangle::validateTriangle() {
    return (totalAngle <= 180);
}

int main() {
    float a, b, c;
    cout << "Enter the sides of the triangle: ";
    cin >> a >> b >> c;

    cout << "Area of the triangle: " << areaOfTriangle(a, b, c) << endl;
    return 0;
}
```

Console / Shell

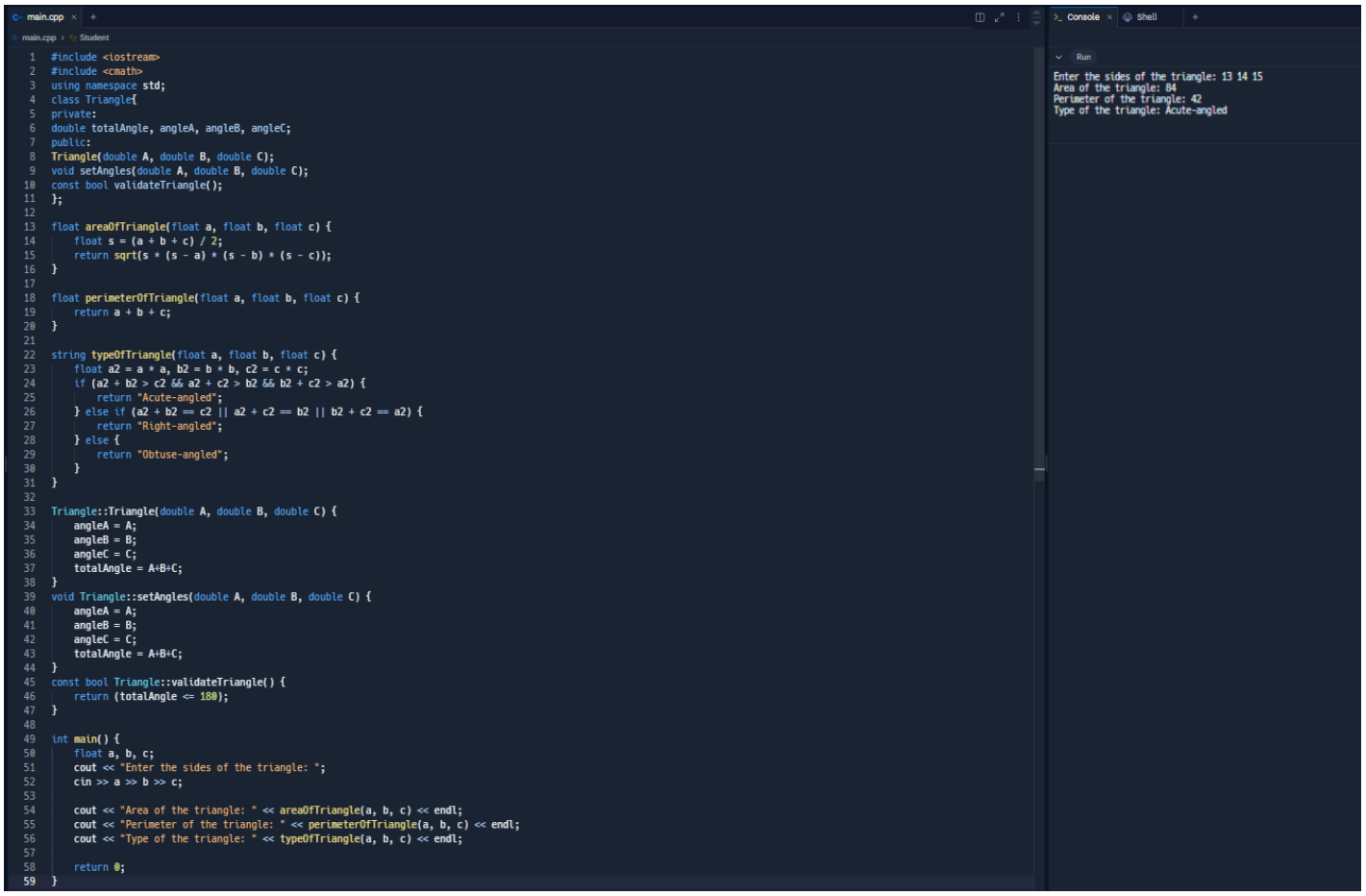
```
Enter the sides of the triangle: 12 13 14
Area of the triangle: 72.3079
```

main.cpp

```cpp
double totalAngle, angleA, angleB, angleC;
public:
Triangle(double A, double B, double C);
void setAngles(double A, double B, double C);
const bool validateTriangle();
};

float areaOfTriangle(float a, float b, float c) {
    float s = (a + b + c) / 2;
    return sqrt(s * (s - a) * (s - b) * (s - c));
}

float perimeterOfTriangle(float a, float b, float c) {
    return a + b + c;
}

Triangle::Triangle(double A, double B, double C) {
    angleA = A;
    angleB = B;
    angleC = C;
    totalAngle = A+B+C;
}
void Triangle::setAngles(double A, double B, double C) {
    angleA = A;
    angleB = B;
    angleC = C;
    totalAngle = A+B+C;
}
const bool Triangle::validateTriangle() {
    return (totalAngle <= 180);
}

int main() {
    float a, b, c;
    cout << "Enter the sides of the triangle: ";
    cin >> a >> b >> c;

    cout << "Area of the triangle: " << areaOfTriangle(a, b, c) << endl;
    cout << "Perimeter of the triangle: " << perimeterOfTriangle(a, b, c) << endl;
    return 0;
}
```

Console / Shell

```
Enter the sides of the triangle: 13 14 15
Area of the triangle: 84
Perimeter of the triangle: 42
```




```cpp
#include <iostream>
#include <cmath>
using namespace std;
class Triangle{
private:
double totalAngle, angleA, angleB, angleC;
public:
Triangle(double A, double B, double C);
void setAngles(double A, double B, double C);
const bool validateTriangle();
};

float areaOfTriangle(float a, float b, float c) {
    float s = (a + b + c) / 2;
    return sqrt(s * (s - a) * (s - b) * (s - c));
}

float perimeterOfTriangle(float a, float b, float c) {
    return a + b + c;
}

string typeOfTriangle(float a, float b, float c) {
    float a2 = a * a, b2 = b * b, c2 = c * c;
    if (a2 + b2 > c2 && a2 + c2 > b2 && b2 + c2 > a2) {
        return "Acute-angled";
    } else if (a2 + b2 == c2 || a2 + c2 == b2 || b2 + c2 == a2) {
        return "Right-angled";
    } else {
        return "Obtuse-angled";
    }
}

Triangle::Triangle(double A, double B, double C) {
    angleA = A;
    angleB = B;
    angleC = C;
    totalAngle = A+B+C;
}
void Triangle::setAngles(double A, double B, double C) {
    angleA = A;
    angleB = B;
    angleC = C;
    totalAngle = A+B+C;
}
const bool Triangle::validateTriangle() {
    return (totalAngle <= 180);
}

int main() {
    float a, b, c;
    cout << "Enter the sides of the triangle: ";
    cin >> a >> b >> c;

    cout << "Area of the triangle: " << areaOfTriangle(a, b, c) << endl;
    cout << "Perimeter of the triangle: " << perimeterOfTriangle(a, b, c) << endl;
    cout << "Type of the triangle: " << typeOfTriangle(a, b, c) << endl;

    return 0;
}
```

## 8. Conclusion

In conclusion, By mastering these concepts, you have gained valuable skills that are essential for solving a wide range of programming problems. Keep practicing and experimenting with these techniques to deepen your understanding and improve your coding proficiency.

## 9. Assessment Rubric