

# CA146 Introduction to Programming in C++

## CA146 Tutorial 1

### Some sample programs to try out and modify

#### 1. A simple program to do a simple calculation

```
#include <iostream>
#include <cmath>

using namespace std;

int
main()
{
    double x1 = 1, y1 = 5, x2 = 5, y2 = 8;
    double side_1, side_2, distance;

    side_1 = x2 - x1;
    side_2 = y2 - y1;
    distance = sqrt(side_1 * side_1 + side_2 * side_2);
    cout << "Distance between the 2 points is " << distance << "cm" << endl;

    return (0);
}
```

**Exercise:** Try out this program after changing (say) x2 to 6 and y1 to -4.

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### 2. A useful modification of sample 1

```
#include <iostream>
#include <cmath>

using namespace std;

int
main()
{
    double x1, y1, x2, y2;
    double side_1, side_2, distance;

    cout << "Supply values of x1, y1, x2, y2 (separated by spaces) " << endl;
    cin >> x1 >> y1 >> x2 >> y2;
    cout << "points are (" << x1 << ", " << y1<<") and" << endl;
    cout << "(" << x2 << ", " << y2 << ")" << endl;

    side_1 = x2 - x1;
    side_2 = y2 - y1;

    distance = sqrt(side_1 * side_1 + side_2 * side_2);
    cout << "Distance between the 2 points is " << distance << "cm" << endl;

    return (0);
}
```

### ***Exercises:***

- 1) Try out this program for different sets of inputs.
- 2) What do you think would be a useful extension of this program?

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### 3. Arabic to Roman numerals

```
#include <iostream>

using namespace std;

void roman (int x);
int romanize(int i, int j, char c);

int
main()
{
    int x = 1;

    // Romanize numbers 1 through 25
    while (x <= 25) {
        roman(x);
        x = x + 1;
    }

    return (0);
}

void
roman(int arabic)
{
    arabic = romanize(arabic, 1000, 'm');
    arabic = romanize(arabic, 500, 'd');
    arabic = romanize(arabic, 100, 'c');
    arabic = romanize(arabic, 50, 'l');
    arabic = romanize(arabic, 10, 'x');
    arabic = romanize(arabic, 5, 'v');
    romanize(arabic, 1, 'i');
    cout << endl;
}

int
romanize(int i, int j, char c)
{
    while (i >= j) {

        cout << c;
        i = i - j;
    }

    return(i);
}
```