Resultant of Concurrent Coplanar Forces

```cpp
// Resultant Of Concurrent Coplanar Forces Ifk

#include<iostream>
#include<cmath>

using namespace std;

int main()
{
    double pi    = 3.14159;
    double toRad = pi / 180;    // conversion factor : Deg->Rad
    double toDeg = 180 / pi;    // conversion factor : Rad->Deg

    int N;  // Total number of forces
    cout << "How many forces ? : \n";
    cin >> N;

    double Fx = 0;  // Summation of Fx
    double Fy = 0;  // Summation of Fy

    double F, th;   // Each force and its angle

    for(int i = 1; i <= N; i++)
    {
        cout << "F" << i << "  :\n";
        cin >> F;

        cout << "th" << i << " :\n";
        cin >> th;

        Fx += F * cos(th * toRad);
        Fy += F * sin(th * toRad);
    }

    double R = sqrt( pow(Fx, 2) + pow(Fy, 2) );
    double thR = atan( Fy / Fx ) * toDeg;

    cout << "Resultant of forces: " << R << endl;
    cout << "Angle of resultant : " << thR << endl;

    return 0;
}
```

Test Case 1

Input

```
2
100
0
100
```

```
90
```

Output

```
How many forces ? :
F1  :
th1 :
F2  :
th2 :
Resultant of forces: 141.421
Angle of resultant : 45
```

Test Case 2

Input

```
4
30
0
50
45
40
120
20
270
```

Output

```
How many forces ? :
F1  :
th1 :
F2  :
th2 :
F3  :
th3 :
F4  :
th4 :
Resultant of forces: 67.5037
Angle of resultant : 47.7866
```