```
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//CS372

#include <iostream>
#include <iomanip>
#include <cstdlib>

using namespace std;

class statistic
{
private:
    float sum = 0.0;
    int length = 0;
    float largest = 0.0;
    float smallest = 0.0;

public:
    statistic(float val);
    statistic(float vSum, int vSize, float vBig, float vSmall);
    //Methods
    void add(float val);
    int getlength();
    float getsum();
    float getaverage();
```

```
    float getlargest();
    float getsmallest();
    void emptystat();
    //Overload
    bool operator!=(statistic S1);
    statistic operator+(statistic S1);
    void operator=(statistic S1);
    friend ostream& operator<<(ostream &out, const statistic& S1);

};


//Method Details
    statistic::statistic(float val)
    {
        sum = val;
        length = 1;
        largest = val;
        smallest = val;
    }

    statistic::statistic(float vSum, int vSize, float vBig, float vSmall)
    {
        sum = vSum;
        length = vSize;
```

```
    largest = vBig;
    smallest = vSmall;
}

void statistic::add(float val)
{
    sum = sum + val;
    length++;
    if(smallest > val)
        smallest = val;
    if(largest < val)
        largest = val;
}

int statistic::getlength()
{
    return length;
}

float statistic::getsum()
{
    return sum;
}

float statistic::getaverage()
```

```
{
    if(length > 0)
        return (sum / length);
    else
        return 0.0;
}

float statistic::getlargest()
{
    return largest;
}

float statistic::getsmallest()
{
    return smallest;
}

void statistic::emptystat()
{
    sum = 0.0;
    length = 0;
    largest = 0.0;
    smallest = 0.0;
}
```

```
//Overload
bool statistic::operator!=(statistic S1)
{
    return!(sum == S1.getsum() &&
            length == S1.getlength() &&
            largest == S1.getlargest() &&
            smallest == S1.getsmallest());
}

statistic statistic::operator+(statistic S1)
{
    float tSum = 0.0;
    int tLength = 0;
    float tLargest = 0.0;
    float tSmallest = 0.0;
    tSum = sum + S1.getsum();
    tLength = length + S1.getlength();
    if(largest > S1.getlargest())
        tLargest = largest;
    else
        tLargest = S1.getlargest();

    if(smallest < S1.getsmallest())
        tSmallest = smallest;
    else
```

```
        tSmallest = S1.getsmallest();

    statistic statSum(tSum, tLength, tLargest, tSmallest);
    return statSum;
}

void statistic::operator=(statistic S1)
{
    sum = S1.getsum();
    length = S1.getlength();
    largest = S1.getlargest();
    smallest = S1.getsmallest();
}

ostream& operator<<(ostream &out, const statistic& S1)
{
    out << "Sum      = " << S1.sum << endl;
    out << "Length   = " << S1.length << endl;
    out << "Average  = " << (S1.sum / S1.length) << endl;
    out << "Largest  = " << S1.largest << endl;
    out << "Smallest = " << S1.smallest << endl;
    return out;
}

//function
```

```
    bool operator==(statistic S1, statistic S2)
    {
        return( S1.getsum() == S2.getsum() &&
                S1.getlength() == S2.getlength() &&
                S1.getlargest() == S2.getlargest() &&
                S1.getsmallest() == S2.getsmallest());
    }

int main()
{
    // Create stats
    statistic statistician1(5.5);
    statistician1.add(6.2);
    statistician1.add(4.3);
    statistician1.add(2.2);

    statistic statistician2(5.5);
    statistician2 = statistician1;

    statistic statistician3(4.4);
    statistician3.add(4.5);
    statistician3.add(9.5);
    statistician3.add(1.1);

    // Perform tests
```

```
// Test ==
cout << "Equal to test" << endl;
if(statistician1 == statistician2)
    cout << "Stat 1 is equal to Stat 2" << endl;
else
    cout << "Stat 1 is not equal to Stat 2" << endl;

if(statistician1 == statistician3)
    cout << "Stat 1 is equal to Stat 3" << endl;
else
    cout << "Stat 1 is not equal to Stat 3" << endl;
cout << endl;

// Test !=
cout << "Not Equal to test" << endl;
if(statistician1 != statistician2)
    cout << "Stat 1 is  not equal to Stat 2" << endl;
else
    cout << "Stat 1 is equal to Stat 2" << endl;

if(statistician1 != statistician3)
    cout << "Stat 1 is not equal to Stat 3" << endl;
else
    cout << "Stat 1 is equal to Stat 3" << endl;
cout << endl;
```

```
    // Test <<
    statistician2 = statistician3;
    cout << "Stat 1\n" << statistician1 << endl;
    cout << "Stat 2\n" << statistician2 << endl;

    // Test +
    statistician3 = statistician1 + statistician2;
    cout << "Stat 3\n" << statistician3 << endl;

    return 0;
}
```

```
Equal to test
Stat 1 is equal to Stat 2
Stat 1 is not equal to Stat 3

Not Equal to test
Stat 1 is equal to Stat 2
Stat 1 is not equal to Stat 3

Stat 1
Sum      = 18.2
Length   = 4
Average  = 4.55
Largest  = 6.2
Smallest = 2.2

Stat 2
Sum      = 19.5
Length   = 4
Average  = 4.875
Largest  = 9.5
Smallest = 1.1

Stat 3
Sum      = 37.7
Length   = 8
Average  = 4.7125
Largest  = 9.5
Smallest = 1.1
```