

In-Class 9 –Reference Parameter Functions

In this exercise, you get practice writing functions that focus on returning information to the calling function. Please note that we are **not** talking about "returning" information to the user or person executing the program. The perspective here is that one function, like `main()`, can call another function, like `swap()` or `calculateSingle()`. Your program passes information **into** the function using parameters; information is passed **back "out"** to the calling function using a single return value or multiple reference parameters. A function can only pass back 1 piece of information using the `return` statement. Your program must use reference parameters to pass back multiple pieces of information.

There is a sort of hierarchy of functions, and this assignment uses each of these:

1. nothing returned by a function - void functions
2. 1 value returned by a function – using a return value
3. 2 or more values returned by a function
 - a. a function uses 2 or more reference parameters (void return value)
 - b. a function uses a return value and reference parameters

The `main()` function is provided below. You must implement the following functions and produce the output below:

1. `double MaxNumbers(double num1, double num2);`
 - Prompt and read 2 double in `main()`
 - `num1` and `num2` not changed
 - Return the larger one between `num1` and `num2`
 - If `num1` equals `num2`, return either one of them
2. `int calcCubeSizes(double edgeLen, double&surfaceArea, double& volume);`
 - pass by value incoming value `edgeLen`
 - outgoing reference parameters `surfaceArea` and `volume` are set in the function
 - return 0 for calculations performed properly
 - you return -1 for failure, like `edgeLen` is negative or 0
3. `int splitNumber(double number, int& integral, double& digital);`
 - pass by value incoming number as a double
 - split the absolute value of incoming number in two parts, the integral part and digital (fraction) part
 - outgoing reference parameters `integral` and `digital` are set in the function
 - return 0 for calculation performed properly
4. `int openAndReadNums(string filename, ifstream&fn, double&num1, double &num2);`
 - pass by value incoming file name as a string
 - outgoing reference parameter `ifstreamfn`, which you open in the function using the filename
 - read 2 numbers from the file you open, and set outgoingreference parameters `num1` and `num2` with the numbers
 - the return value must be 0 when both the file opens OK and the numbers are read OK (OK means the `fn` variable is not 0). Inside the function

- Check (!fn) after you "try" to open the file, and print "Error!" if it doesn't open;
- check (!fn) after you "try" to read the 2 values, and print "Error Reading!" if either of the reads fail.
- Return positive numbers if either error occurs. You can use 1, or 1 and 2.

Sample Input & Output

Enter 2 numbers to find the max one: 8, 2
The max one is: 8

Enter anedgeLen: 2.4
Surface Area: 34.56
Volume: 13.82

Enter a number: 1.6
The integral part: 1
The decimal part: 0.60

Enter a filename to read from: sample1.txt
first=2.10 second=3.50 third=3.70

=====
Enter 2 numbers to find the max one: 7.1 3.45
The max one is: 7.10

Enter a edgeLen: 3
Surface Area: 54.00
Volume: 27.00

Enter a number: 1618
The integral part: 1618
The decimal part: 0.00

Enter a filename to read from: sample2.txt
first=1.10 second=3.00 third=4.10

Submit Your Work to Web-CAT

The assignment will not be available on Web-CAT until Tuesday.

Starter for main():

Don't forget to add #include and using namespace statements.

```
int main()
{
    int ret2;
    double ret1, num1, num2, number, area, volume, edgeLen;
    double f, s, third;
    int integ;
    double decimal;
    string filename;
    ifstream file;

    cout<< "Enter 2 numbers to find the max one: ";
    cin>> num1 >> num2;
    //function call #1 You add the call.
    ret1 =          ;

    cout<< fixed <<setprecision(2) << "The max one is: " << ret1 << endl;

    cout<< "\nEnter a edgeLen: ";
    cin >> edgeLen;
    // function #2 You add the call, using surface and area as some of the parameters.
    ret2 =          ;

    cout << "Surface Area: " << area <<endl;
    cout << "Volume: " <<volume<<endl;

    cout << "\nEnter a number: ";
    cin >> number;
    // function #3 You add the call, using number,
    //          num1 as the integral and num2 as the decimal parameters.
    ret2 =          ;
    cout << "The integral part: " << integ <<endl;
    cout << "The decimal part: " << decimal <<endl;

    cout<< "Enter a filename to read from: ";
    cin>> filename;

    // function #4 You add the call, using file, num1, and num2 as some of the parameters.
    ret2 =          ;
    if ( ! ret2 )
    {
        // This variable file ifstream is the param returned by openAndReadNums().
        // This statement reads and then print a third number.
        // You can read from file inside the function AND here because you
        // are passing it as a reference parameter.
        file >> third;
        cout<< "first=" << f << " second=" << s << " third=" << third <<endl;
    }
    else
        cout<< "File did not open or Read failed\n\n";
    return 0;
}
```