

1 Classes and Data Abstraction IV, Lab Exercise 3 - Simple Calculator

Write a **SimpleCalculator** class that has **public** methods for adding, subtracting, multiplying and dividing two **doubles**. Sample calls are as follows:

```
double answer = sc.add( a, b );
```

Object **sc** is of type **SimpleCalculator**. Method **add** returns the result of adding its two arguments.

```
double answer = sc.subtract( a, b );
```

Method **subtract** returns the result of subtracting its two arguments.

```
double answer = sc.multiply( a, b );
```

Method **multiply** returns the result of multiplying its two arguments.

```
double answer = sc.divide( a, b );
```

Method **divide** returns the result of dividing its two arguments. The output should appear as follows:

```
The value of a is: 10
The value of b is: 20

Adding a and b yields 30
Subtracting b from a -10
Multiplying a and b yields 200
Dividing a by b yields 0.5
```

```
//SimpleCalculator.h
class SimpleCalculator {
public:
    /* write prototype for add method */
    double subtract( double, double ) const;
    /* write prototype for multiply method */
    /* write prototype for divide method */
};

-----

//SimpleCalculator.cpp
#include "SimpleCalculator.h"
```

```

/* write definition for add method */

/* write definition for subtract method */

/* write definition for multiply method*/

/* write definition for divide method*/
-----
//CalcDriver.cpp
#include <iostream>
#include "SimpleCalculator.h"

using std::cout;
using std::endl;

int main()
{
    double a = 10.0;
    double b = 20.0;
    /* declare any other variables needed here          */
    /* instantiate an object of type SimpleCalculator */

    cout << "The value of a is: " << a << "\n";
    cout << "The value of b is: " << b << "\n\n";

    /* write a line that adds a & b through your SimpleCalculator
    object; assign the result to variable named "addition"*/
    cout << "Adding a and b yields " << addition << "\n";

    double subtraction = sc.subtract( a, b );
    cout << "Subtracting b from a " << subtraction << "\n";

    double multiplication = sc.multiply( a, b );
    cout << "Multiplying a and b yields " << multiplication
        << "\n";
    /* write a line that divides a and b through your
    SimpleCalculator object; assign the result to a
    variable named "division" */
    cout << "Dividing a by b yields " << division << endl;

    return 0;
}
-----

```

Tips:

- All methods have return type **double**.

Questions

1. Do we need to use constructor for **SimpleCalculator** class ? Why?
2. Do we need to use **private** data members for the class **SimpleCalculator**? Why?