Polytechnic University of Puerto Rico
Electrical and Computer Engineering & Computer Science Department
CECS 2223 – Computer Programming II Lab

Lab 2

Name: Coral S. Schmidt Montilla ID#: 148830

1. Copy the source code developed for Lab 2 and paste it as **text** below. (*15 points*)

```
/*
* CECS 2223, Computer Programming II Laboratory
* Fall 2023, Sec. 09
* Date: August 23, 2023
* Topic: Parameterized Constructors and Class Variables
* File name: Box.cpp
* Name: Coral S. Schmidt, ID#148830
* This file defines the Box class
*/
// do we need any preprocessor directives?
#include "Box.h"

// initialize the class variable to 0
int Box::boxCount = 0;

// Define the default constructor; assign -1 to all fields
// and increments the value of the class variable
Box::Box()
{
	height = -1;
	width = -1;
	length = -1;

	boxCount++;
}

// The parameterized constructors assign the parameter's value
// to the fields only if the value is valid. Use the ternary, or
// conditional, operator for the assignment operation, using 0
// as the value to be assigned when the condition is false. The
// parameters represent the values for the fields in the height,
// width, and length order. For example, the constructor with one
// parameter receives the value for height, and the one with two
// parameters receives the values for height and width.
// Recall that all constructors must increment the class variable

Box::Box(int aHeight)
{
	height = (aHeight > 0) ? aHeight : 0;
	width = -1;
	length = -1;

	boxCount++;
}
```

```
Box::Box(int aHeight, int aWidth)
{
	height = (aHeight > 0) ? aHeight : 0;
	width = (aWidth > 0) ? aWidth : 0;
	length = -1;

	boxCount++;
}

Box::Box(int aHeight, int aWidth, int aLength)
{
	height = (aHeight > 0) ? aHeight : 0;
	width = (aWidth > 0) ? aWidth : 0;
	length = (aLength > 0) ? aLength : 0;

	boxCount++;
}
// The copy constructor assigns the attribute values of the parameter
// to the new object and increments the value of the class variable.

Box::Box(const Box& aBox)
{
	height = aBox.getHeight();
	width = aBox.getWidth();
	length = aBox.getLength();

	boxCount++;
}

// The destructor does not include any code, it is defined
Box::~Box() {}

// The set methods DO NOT prompt the user for values or include
// any cout or printf statements. Make sure that the values
// received as parameters are valid. Use the ternary, or
// conditional, operator for the assignment operation, using the
// current value of the field as the option when the condition
// is false. The setter methods have no return value.
void Box::setHeight(int aHeight)
{
		height = (aHeight > 0) ? aHeight : height;
}

void Box::setWidth(int aWidth)
{
		width = (aWidth > 0) ? aWidth : width;
}

void Box::setLength(int aLength)
{
		length = (aLength > 0) ? aLength : length;
}
```

```
// define the get methods, they should all be constant
int Box::getHeight() const
{
	return height;
}

int Box::getWidth() const
{
	return width;
}

int Box::getLength() const
{
	return length;
}

int Box::getVolume() const
{
	return getHeight() * getWidth() * getLength();;
}

int Box::getBoxCount() const
{
	return boxCount;
}

// The printBox method uses printf to output values formatted
// to be displayed in a table at 8 spaces per column aligned to
// the left of the column. The values to be displayed are: height,
// width, length, and volume. All values must be printed in the
// same line.
void Box::printBox() const
{
	printf("%-8i%-8d%-8i%-8d\n", getHeight(), getWidth(), getLength(),
getVolume());
}
/*
* CECS 2223, Computer Programming II Lab
* Fall 2023, Sec. 09
* Date: August 23, 2023
* Topic: Parameterized Constructors and Class Variables
* File name: lab02.cpp
* Name: Coral S. Schmidt, ID#148830
* Complete the C++ code as required
*/
// do we need any preprocessor directives?
#include "Box.h"

// the main function returns an integer value, should be 0
int main() {
	// declare a Box object, named box1, using the default constructor
	Box box1;
```

```
	// assign a height of 1, width of 10 and a length of -20 to box1
	box1.setHeight(1);
	box1.setWidth(10);
	box1.setLength(-20);

	// declare a Box object, named box2, using the 1-parameter constructor
	// with a value of 2 for the height.
	Box box2(2);

	// assign a width of -5 and length of 10 to box2
	box2.setWidth(-5);
	box2.setLength(10);

	// declare a Box object, named box3, using the 2-parameter constructor
	// with a value of 3 for the height and 4 for the width
	Box box3(3, 4);

	// assign a length of 12 to box3
	box3.setLength(12);

	// declare a Box object, named box4, using the 3-parameter constructor
	// with values of -4 for height, 4 for width, and 4 for length
	Box box4(-4, 4, 4);

	// get the value of boxCount to complete the printf statement
	printf("The %i boxes created have the following dimensions:\n",
box1.getBoxCount());

	// table headers
	printf("%-8s%-8s%-8s%-8s%\n", "HEIGHT", "WIDTH", "LENGTH", "VOLUME");

	// using printBox method, print the dimensions for each Box object
	box1.printBox();
	box2.printBox();
	box3.printBox();
	box4.printBox();
	cout << endl;

	// assign a length of 20 to box1
	box1.setLength(20);

	// assign a width of 5 to box2
	box2.setWidth(5);

	// assign a length of -8 to box3
	box3.setLength(-8);

	// assign a height of 4 to box4
	box4.setHeight(4);

	// get the value of boxCount to complete the printf statement
	printf("The %i boxes created have the following dimensions:\n",
box1.getBoxCount());
```

```
        // table headers
        printf("%-8s%-8s%-8s%-8s\n", "HEIGHT", "WIDTH", "LENGTH", "VOLUME");
        // using printBox method, print the dimensions for each Box object
        box1.printBox();
        box2.printBox();
        box3.printBox();
        box4.printBox();

        // write a statement which prints the phrase
        // "Program developed by Coral S. Schmidt Montilla, ID#148830"
        // where the square brackets and the text within is substitued with
        // your personal information. Make sure to include a blank line
        // before and after the phrase.
        printf("\nProgram developed by Coral S. Schmidt, ID#148830\n");

        system("pause"); // for Visual Studio use only
        return 0; // this statement MUST be included at the end of main
}
```

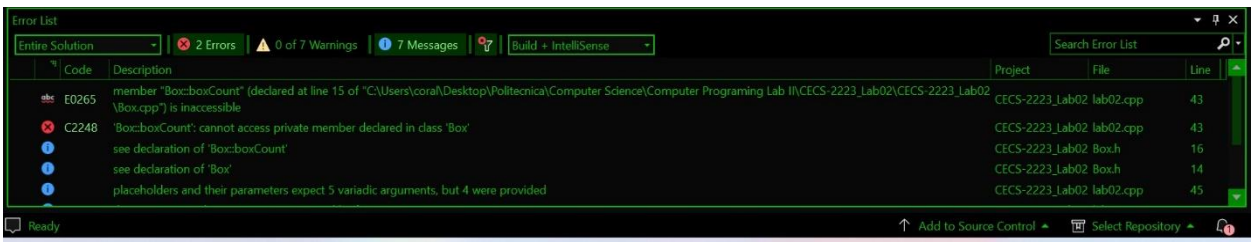
2. Paste the screenshots of the program's execution below. (*5 points*)

```
C:\Users\coral\Desktop\Politecnica\Computer Science\Computer Programing Lab II\CECS-2223_Lab02\x64\Debug\CECS-2223_Lab02.exe
The 4 boxes created have the following dimensions:
HEIGHT  WIDTH   LENGTH  VOLUME
1       10      -1      -10
2       -1      10      -20
3       4       12      144
0       4       4       0

The 4 boxes created have the following dimensions:
HEIGHT  WIDTH   LENGTH  VOLUME
1       10      20      200
2       5       10      100
3       4       12      144
4       4       4       64

Program developed by Coral S. Schmidt, ID#148830
Press any key to continue . . .
```

3. Comment on any warnings or errors revealed by Visual Studio. If any error messages were present, list the error and describe how you corrected it. If no errors or warnings were revealed, comment on the most important aspect of developing the solution. (*5 points*)



Error:

```
// get the value of boxCount to complete the printf statement
```

```
      printf("The %i boxes created have the following dimensions:\n", getBoxCount());
Error fixed:
// get the value of boxCount to complete the printf statement
      printf("The %i boxes created have the following dimensions:\n",
box1.getBoxCount());
```

I corrected it by adding “box1.”