Problem Set 05 - OOP - Part II

For each class below create a header file with the same name and for each C++ program create a file with a name in the format

`main5`*n*`.cpp`

where *n* is the number of the program in the list below.

Tasks:

1. Create a class named *Shape* that contains
   - ☐ A public pure virtual double constant method named `Area()` that takes no parameters.
   - ☐ A public pure virtual double constant method named `Perimeter()` that takes no parameters.
2. Create a class named *Rectangle* that publicly inherits *Shape* and contains
   - ☐ A private double field named *length*.
   - ☐ A private double field named *width*.
   - ☐ A public default constructor that initializes both fields to 1.
   - ☐ A public copy constructor.
   - ☐ A public overloaded assignment operator.
   - ☐ A public double constant method named `GetLength()` that takes no parameters and returns *length*.
   - ☐ A public double constant method named `GetWidth()` that takes no parameters and returns *width*.
   - ☐ A public void method named `SetLength()` that takes a double parameter and assigns the parameter to *length* only if the parameter is positive and at least the value of *width*.
   - ☐ A public void method named `SetWidth()` that takes a double parameter and assigns the parameter to *width* only if the parameter is positive and at most the value of *length*.
   - ☐ A public overridden `Area()` that returns the product of *length* and *width*.
   - ☐ A public overridden `Perimeter()` that returns twice the sum of *length* and *width*.
   - ☐ A public string constant method named `ToString()` that takes no parameters. It returns a rectangular string of asterisks with a length and width equal to *length* and *width*, respectively.
3. Create a class named *Square* that take publicly inherits *Rectangle* and contains
   - ☐ A public default constructor that initializes both fields to 1.
   - ☐ A public copy constructor.
   - ☐ A public overloaded assignment operator.
   - ☐ A deleted `GetLength()`.
   - ☐ A deleted `GetWidth()`.
   - ☐ A deleted `SetLength()`.
   - ☐ A deleted `SetWidth()`.
   - ☐ A public double constant method named `GetSide()` that takes no parameters and returns either *width* or *length*.
   - ☐ A public void method named `SetSide()` that takes a double parameter and assigns the parameter to both *length* and *width* if the parameter is positive.
4. Write a program that
   - ☐ Creates a *Rectangle* and *Square* object,
   - ☐ Manipulates the *Rectangle* object to represent a rectangle with a length and width of 8 and 6, respectively,
   - ☐ Manipulates the *Square* object to represent a square with sides equal to 5,
   - ☐ Displays the objects using their `ToString()` methods.