**Exercise #1:**

Create an abstract class called “Shark”. It should have the private class variables: name, length and weight. There should be getter (accessor) and setter (mutator) methods for these three class variables. It should also have a “SharkFood” method that has the shark digest its food and gain weight. Lastly, it will need to override the default “ToString” method to print out its class variables and make a call to the “SharkFood” method.

Create 2 classes that inherit from the “Shark” class, call them “AdultGreatWhiteShark” and “AdultTigerShark”.

Make sure to allow their class variables to be set through their constructors.

Both types of sharks can be given any name, like “Nancy”. However, their heights and weights must be within a specific range for each of the classes. If given a number too low, set it to the smallest possible value or if given a number too high set it to the largest possible value. View the values below.

Adult great white sharks can range from 10 – 21 ft in height, and 1,500 - 2,400 lbs. in weight. Adult tiger sharks can range from 10 – 13 ft in height, and 849 – 1,400 lbs. in weight.

Override their “SharkFood” method, so that after a great white shark eats a tuna it will gain some weight (let’s say inclusively between 20 lbs. and 50 lbs.). While after a tiger shark eats a large sea turtle, it will gain some weight (this time inclusively between 15 lbs. and 40 lbs.).

Next, create both the “BabyGreatWhiteShark” and the “BabyTigerShark” classes, which should inherit from their adult counterparts. The only difference is that upon initialization their height and weight should be taken from an existing Adult and lowered by 50%. These variables should be passed to the baby’s constructor using the getters (accesors) of the parent object in the main method.

Finally, create an object of the “AdultGreatWhiteShark” and “AdultTigerShark” classes inside your “Main” method. Using the “ToString” method, print out the class variables of both of your objects. Then initialize one object of each of the baby class types and print out their values the same way.

**Sample Output:**

Bob is a great white shark and its height is 12 feet and its weight is 1,600 pounds. Bob ate a tuna and has gained 30 lbs.

Kim is a tiger shark and its height is 10 feet and its weight is 950 pounds. Kim ate a turtle and gained 40 lbs.

Laura is a baby great white shark its height is 6 feet and its weight is 800 pounds. Laura can a tuna and gained 20 lbs.

Tim is a baby tiger shark and its height is 5 feet and its weight is 475 pounds. Tim ate a turtle and gained 17 lbs.

**Exercise #2:**

Calculate the sum of ArrayList using recursion.

Take user input to fill the ArrayList, at least 10 integers. While you fill the ArrayList also check ArrayIndexOutOfBound exception using try and catch. You do not need to write your own exception. You can use system exception by importing exception class in your program.

Print the ArrayList and the sum of ArrayList.

**Sample Input:**

Please enter a number: 0

Please enter a number: 1

Please enter a number: 2

Please enter a number: 3

Please enter a number: 4

Please enter a number: 5

Please enter a number: 6

Please enter a number: 7

Please enter a number: 8

Please enter a number: 9

**Sample Output:**

ArrayList contents: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

The sum of the ArrayList contents: 45