Johns Hopkins University
CTY*Online*

Advanced Java Programming

Assignment 3

This assignment will involve using inheritance, interfaces, and polymorphic behavior.

You will write a program that deals with different types of animals. For this assignment you will be dealing with dogs and birds, but other types of animals may be added in the future.

All animals have certain things in common. For our purposes, common animal characteristics include age and weight. In terms of common behavior, all animals should be able to be displayed.

Dogs are able to make sounds and do tricks. Different types of dogs make different sounds and may also do different tricks.

Birds can make sounds that will differ according to type of bird, and most birds can also fly.

For this assignment you'll deal with two types of dogs: Chihuahuas and French Poodles. Chihuahuas make a "Yo quiero taco bell" sound and can do tricks like sit up and lie down. French Poodles make a "Bonjour mon ami" sound and can sit up, lie down, and shake hands.

You'll also deal with two types of birds: Robins and Bluebirds. Robins make a "chirp chirp" sound and Bluebirds make an "eek eek eek" sound.

Develop code for the above classes. Then, write a program that uses polymorphism to invoke their sound behaviors. The program should store a Robin, Bluebird, Chihuahua and French Poodle in an array of the appropriate type. Then, the program should generate random numbers in the range 0 to 3, and invoke the behavior for the corresponding array element. For example, if the first random number is 3, the program should invoke the sound for the array element with subscript 3, and so forth. The program should not check the type of the array element. Instructions on how to generate random numbers is contained below.

Please be sure to use good programming style and comment your code.

Johns Hopkins University
CTY*Online*

Advanced Java Programming

Submit the source code (the .java file) for your assignment and a screen shot of the program output in a zip file named as follows: Assignment3 followed by an underscore (_), followed by your first name initial, followed by your last name, followed by your CTYOnline student ID. For example, if your name is Jane Smith and your student ID is 999999, your zip file would be *Assignment3_jsmith999999.zip*.

Generating Random Numbers

The following will be helpful in completing this exercise.

Java provides a mechanism for instantiating a random number generator from the class Random that is defined in java.util.Random package.

A random number generator object can be instantiated this way:

```
Random r = new Random();
```

The Random class has a method called nextInt(k) that will generate the next random number in the range 0 through k-1 and return it as an integer.