

Design a Java Animal class (assuming in Animal.java file) and a sub class of Animal named Cat (assuming in Cat.java file).

**The Animal class** has the following protected instance variables:

boolean vegetarian, String eatings, int numOfLegs, java.util.Date birthDate and the following public instance methods:

constructor without parameters: initialize all of the instance variables to some default values

constructor with parameters: initialize all of the instance variables to the arguments

SetAnimal: assign arguments to the instance variables of vegetarian, eatings, numOfLegs

Three "Get" methods which retrieve the respective values of the instance variables: vegetarian, eatings, numOfLegs

toString: Returns the animal's vegetarian, eatings, numOfLegs and birthDate information as a string

**The Cat class** has the following private instance variable:

String color and the following public instance methods:

constructor without parameters: initialize all of the instance variables to some default values, including its super class - Animal's instance variables

constructor with parameters: initialize all of the instance variables to the arguments, including its super class Animal's instance variables

SetColor: assign its instance variable to the argument

GetColor: retrieve the color value

overridden toString: Returns the cat's vegetarian, eatings, numOfLegs, birthDate and color information as a string

**Please write your complete Animal class, Cat class and a driver class as required below**

a (32 pts) Write your complete Java code for the Animal class in Animal.java file

b (30 pts) Write your complete Java code for the Cat class in Cat.java file

c (30 pts) Write your test Java class and its main method which will create two Cat instances: e1 and e2, e1 is created with the default constructor, e2 is created with the explicit value constructor. Then update e1 to reset its vegetarian, eatings, numOfLegs and color. Output both cats' detailed information. The above test Java class should be written in a Java file named testAnimal.java.

d (8 pts) Please explain in detail from secure coding perspective why Animal.java class's "set" method doesn't assign an argument of type java.util.Date to birthDate as well as why Animal.java class doesn't have a "get" method for birthDate.

**Please submit the three .java files as well as a plain text file for question d. (running result is not required).**