CSC 122: Animal Sound System

Inheritance and Polymorphism

1 Introduction

In this lab you will be learning about inheritance and polymorphism. This will be accomplished by building an Animal sound system.To implement this lab, the pictures and sounds will be provided and the students will have to map each picture with the sound utilizing the idea of inheritance and polymorphism.

2 Objective

The purpose of this lab is to teach students, the idea of inheritance and polymorphism. After building the Animal sound system, the students will learn the concepts of inherting classes, the super references, overriding methods, polymorphism and asbtract mechanism by playing different sounds for different selection of animal pictures. By working on this lab students will be able to understand how inheritance and polymorphism really works.

3 Activity

This section describes the tasks to be completed that will satisfy the given objectives.

3.1 Background Information

Inheritance can be described as compile-time mechanism in Java that enables you to extend a class (called the base class or superclass) with another class (called the derived class or subclass). In Java, inheritance is utilized for two purposes, class inheritance and interface inheritance. In this lab we will be focusing mostly on class inheritance. The idea of inheritance really is easy but powerful, When you intend to create a new class and there exits a class already that includes some of the code that you want, you can derive your new class from the existing class. In doing this, you can reuse the fields and methods of the existing class without having to write (and debug!) them yourself.

In programming languages, polymorphism implies that some code or operations or objects act otherwise in different contexts. The dictionary definition of polymorphism means a principle in biology in which an organism or species may have many different forms or phases. This principle can

also be utilized on object oriented programming and languages like the Java language. Subclasses of a class can define their own unique behaviors and yet share some of the same functionality of the parent class.

3.2 Implementation

This section will guide you through the completing of the lab.

3.2.1 Create Subclasses

Create two different subclasses of animal class and name them Wolf and Lion. And then create two subclasses of Wolf named Coyote and Hyena and two subclasses of Lion named Cougar and Leopard.

3.2.2 Create Abstract Methods

Provide the implementation for abstract methods of Animal class in Wolf and Lion classes.

3.2.3 Passing an Argument

Call the super class constructor and pass "Context" type as its argument because the Animal (parent) class takes Context type as an argument and the Wolf and Lion class constructor also takes "Context" type as an argument.

3.2.4 Setting the Instance Variable

Set the instance variable (name) of Animal class in all of Animals subclasses.

3.2.5 Overriding Methods

Override the methods of Wolf and Lion in its child classes so that it would produce different sounds when clicked on different picture choices.

3.2.6 Use Polymorphism

In Animal activity class, use polymorphism to initialize the Animal array.

4 Conclusion

After the successful completion of this lab the students will be able to utilize the concepts of inherting classes, the super references, overriding methods, polymorphism and asbtract mechanism for designing and building effecient applications on Android mobile phone.

5 Deliverables

To submit your application, export your Eclipse project as a file system, zip all of the files into an archive and submit them online with the filename `<first_name_initial><last_name>-lab<lab#>.zip`.