CSC 122: Inheritance and Polymorphism

Building a Animal Sound System

February 24, 2012

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.

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.

2 Objective

The purpose of this lab is to teach 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

1. Create two different subclasses of animal class and name them Wolf and Lion.
2. Provide the implementation for abstract methods of Animal class in Wolf and Lion classes.

3. Create two subclasses of Wolf named Coyote and Hayne and two subclasses of Lion named Cougar and Leopard.
4. 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.
5. Set the instance variable (name) of Animal class in all of Animals subclasses.
6. Override the methods of Wolf and Lion in its child classes so that it would produce different sounds when clicked on different picture choices.
7. 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 complete this lab the students will be required to:
1. Provide a demonstration of your functional application to Dr. Jean Gourd or the Lab Assistant during Lab hours no later than the due date . Ensure to plan for this accordingly. Come well prepared to exhibit in the beginning of lab on the lab due date at the latest and you will be fine.
2. Submit your signed”. apk” file on moodle. This effectively provides time-stamped evidence that you submitted the lab on time should there be any discrepancy after in the quarter. The name of your application should be lab1 username. apk. So if your username is JDoe, then your file would be named lab1JDoe.apk.

6 References

1. Android Developers Package Index. Internet:
http://developer.android.com/reference/packages.html, Jan. 18, 2012 [Jan. 19, 2012].
2. Dr. D. Janzen. Android App Course. Internet: http://sites.google.com/site/androidappcourse/, [Jan. 19, 2012].
3. ”Animal Sounds:” Royalty Free Music, Free Sound Effects, Free Royalty Free Music Loops. Web. 24 Feb. 2012. ¡http://www.partnersinrhyme.com/soundfx/animals/BigCats.shtml¿.
4. http://madeirariviera.blogspot.com/2011/01/lion.html
5. http://animalsspecies.blogspot.com/2011/02/gray-wolf-wolves-are-one-species-of-dog.html
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