National University of Computer and Emerging Sciences



Lab Exercise 10

For

Object Oriented Programming Lab

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**FAST School of Computing**

# Instructions:

1. Make a word document with the naming convention “SECTION\_ LAB#\_ROLLNO” and put all your source code and snapshots of its output in it. Make sure your word file is formatted properly.
2. Plagiarism is strictly prohibited.
3. Do not discuss solutions with one another.

# Useful links

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| **Question#1** |

Package-delivery services, such as FedEx®, DHL® and UPS®, offer a number of different shipping options, each with specific costs associated. Create an inheritance hierarchy to represent various types of packages. Use Package as the base class of the hierarchy, then include classes TwoDayPackage and OvernightPackage that derive from Package. Base class Package should include data members representing the name, address, city, state and ZIP code for both the sender and the recipient of the package, in addition to data members that store the weight (in ounces) and cost per ounce to ship the package. Package’s constructor should initialize these data members. Ensure that the weight and cost per ounce contain positive values. Package should provide a public member function calculateCost that returns a double indicating the cost associated with shipping the package. Package’s calculateCost function should determine the cost by multiplying the weight by the cost per ounce. Derived class TwoDayPackage should inherit the functionality of base class Package, but also include a data member that represents a flat fee that the shipping company charges for two-day-delivery service. TwoDayPackage’s constructor should receive a value to initialize this data member. TwoDayPackage should redefine member function calculateCost so that it computes the shipping cost by adding the flat fee to the weight-based cost calculated by base class Package’s calculateCost function. Class OvernightPackage should inherit directly from class Package and contain an additional data member representing an additional fee per ounce charged for overnight-delivery service. OvernightPackage should redefine member function calculateCost so that it adds the additional fee per ounce to the standard cost per ounce before calculating the shipping cost. Write a test program that prompts the user to input type of Delivery, and then creates the object of that class. Outputs the result of calculateCost() function.

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| **Question#2** |

Write a program which can detect the sounds of Animals. Write a class Animals having the following attributes:

1. String Name

2. Sound()

Inherit the following classes from Animals having the same attributes and behavior of base class (polymorphism).

1. Cat

2. Dog

3. Tiger

4. Deer

Your task is to create an array of pointers of base class in main(). After doing so, generate random numbers between 1 and 4 and assign the objects depending on the number generated. For example, at first iteration if random numbers 2 is generated an object of class Dog will be created, if at second iteration 4 is generated an object of class Deer will be created and so on. Now, display their sounds by calling the function sound() in a loop.

Hint: Like sound for Cat is “Meowmeow” :P

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| **Question#3** |

Create a class **Employee**.

Inherit class **hourlyEmployee** and **salariedEmployee** from **Employee**.

Inherit class **Secretary** and **Engineer** from **Employee**.

Now, inherit a class **engineeringManager** from **salariedEmployee** and **Engineer**.

Write a program where user will input the type of object he/she wants to create. After doing so, your program will input the attributes and print them.

