**Centennial College**

**COMP 228: Java Programming**

**Hands-on Midterm Test**

**Student:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Be sure to read the following general instructions carefully:**

* This lab test must be completed individually by all the students.
* Save your program periodically just in case that your PC crashes.

##### Exercise 1

Start a new Java project in Eclipse or IntelliJ Idea. Name the project: **YourFullName\_COMP228\_SECNumberTest**.

For example: JohnSmith\_COMP228\_012Test. **DO NOT** create any package in this project.

Create a class called *Address.* The class should declare the following variables:

* an instance variable that describes the *province* – String
* an instance variable that describes the *city* – String
* an instance variable that describes the *street name* – String
* an instance variable that describes the *street number* – integer
* an instance variable that describes the *unit number* – integer

Create a class called *Property*. The class should declare the following variables:

* an instance variable that describes the *bedrooms* - Integer
* an instance variable that describes the *bathrooms* - Integer
* an instance variable that describes the if the property has *parking –* boolean
* an instance variable that describes the *living area* – integer
* an instance variable that describes the *price* – integer
* a member that describes the *address –* Address (**composition**)

Create the **getter** and **setter** methods for each instance variable and necessary constructors. Provide a ***toString()*** method that returns the information stored in the above variables.

Create three subclasses called *House*, *Condo*, and *TownHouse*.

Property

Condo

House

TownHouse

Create an Interface called Insurable with following method:

* ***setPremium(price Integer)*** that takes the price as input and returns a double

These subclasses should implement *Insurable* Interface. You need to use the following rules to implement the interface methods:

* + For houses, premium equals house price multiply 0.002
  + For town houses, premium equals town house price multiply 0.0015
  + For condos, premium equals condo price multiply 0.001

Write a driver program (another class with **main** method) that uses the above hierarchy. In your driver program you must implement an interaction with the user.

* Use showInputDialog method to let the user input property information such as property type and price. After selecting the property type, an appropriate object should be instantiated and the premium should be calculated accordingly.
* Use showMessageDialog method to display property information including property type, prise, and premium.

You should create a video demo of your application. You should upload the demo and the entire project on eCentennial immediately after demonstration.

**Evaluation:**

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| **Functionality** |  |
| Correct implementation of classes (instance variable declarations, constructors, getter and setter methods, etc.) | 30% |
| Correct implementation of Inheritance/Polymorphism | 20% |
| Correct implementation of driver classes (declaring and creating objects, calling their methods, interacting with user, displaying results) | 35% |
| Comments, correct naming of variables, methods, classes, etc. | 5% |
| **Friendly input/output** | 10% |
| **Total** | 100% |