CS201 Exam #2 Review

Topics

- Lab 3
  - Vector
    - Declare one and instantiate one
    - Add Strings to the vector
  - Iterator
    - Declare and instantiate an iterator for a Vector
    - Write a loop to iterate through all elements of the vector

- Lab 4 unit testing
  - Given a description of a class and methods, write a unit test
    - Proper declaration of a test method
    - Proper use of setup()
    - Assert methods
    - assertEqual, etc.
  - Be able to add and retrieve something from a HashMap

- Lab 6 GUI
  - Declare a JFrame
  - Declare a JButton
    - Add the JButton to the JFrame
    - Change the text of the JButton
    - Be able to implement the actionPerformed method (i.e., print something to the console)
    - Be able to add an action listener to the JButton

- Exceptions
  - Checked exception:
    - What are they
    - Give an example
  - Unchecked exception:
    - What are they
    - Give an example
  - Instantiate an exception
  - throw an exception
  - catch an exception
  - Explain the catch or throw policy
  - Be able to write a small try-catch block

- Lab 7 - Strategy pattern
  - Define a family of algorithms
  - Encapsulate each one
  - Make them interchangeable
  - Not client dependent
  - Use the class to encapsulate the method
  - “register” the class
  - Then can use the method
  - Environment class
    - Private member updateStrategy:
      - Interface UpdateStrategy
      - Environment constructor
- Pass an UpdateStrategy object
  - “register” it with the class
    - Call the updateStrategy.temperatureChange() method
    - What if no strategy passed into constructor?
    - Default strategy ConstantUpdateStrategy class
  - How do we prevent users from calling a default constructor

- Inheritance
  - Subclass
  - Superclass
  - Can’t have multiple inheritance
    - Can implement multiple interfaces
  - Use of super keyword
  - Abstract classes
    - Can we instantiate one?
    - How to declare?
    - How to declare abstract methods?
  - Interfaces
    - How to declare
    - How to implement

- Polymorphism
  - instanceof operator
  - Superclass defines methods
  - Subclasses may modify behaviors
  - Different behavior based on the type of the object
  - i.e., array of shapes
    - Shape theShapes = new Shape[MAXSIZE];
    - theShapes[0] = new Circle(1,1);
    - theShapes[1] = new Square(10,10);
    - theShapes[2] = new Triangle(15,15);
    - for(int i = 0;i<MAXSIZE;i++) {
        theShapes[i].draw();
    }  // does different things

- Old subjects
  - Private, public, protected
  - Package scope
  - Instances
  - References
  - Declaration
  - Instantiation
  - Overloading
  - Overriding
  - Variables vs objects
    - Name equivalence
    -Aliases
    - Shallow copy (operates on variables)
    - Copy constructor
  - Pass by value
    - Problems with swap method