Java Exam 2: Graded out of 50.

1. Define the following terms (2 pts each):
   1. Unit Test = Testing of individual units of the source code to see if the code is fit for use.
   2. Object = Objects have states and behaviors, an instance of a class. The objects behavior is shown through what is called methods.
   3. JFrame = Creates a window frame for the programmer to then add objects to create an application.
   4. Encapsulation = Wrapping the variables and code acting on the methods together as a single unit. The variables of a class are hidden from other classes and can only be accessed through the methods of their current class.
   5. Inheritance = The mechanism in java which one object can acquire all the properties and behaviors of the parent object. Usually the parent object is denoted by super().
   6. Input Sanitation = Checking for specific sets in strings that may allow for vital information to be released.
   7. Polymorphism = Having many states. A parent class may refer to a child class, allowing a program to take many shapes.
   8. Interface = Reference type in java, which is a collection of abstract methods. A class may implement an interface, which will inherit the abstract methods of the interface.
   9. Primitive type = Building blocks of data manipulation in java. They serve to contain pure, simple values of one kind. The order of operations is predefined. They are, boolean, byte, char, short, int, long, float, double.
   10. Test-Driven Development = Software development process that relies on the repetition of a very short development cycle. Usually the code is failing tests.
   11. Servlet = Processes or stores a java class in Java EE that conforms to the Java servlet API, which is a standard for implementing java classes that respond to requests.
2. Explain the roles of the following elements in a swing application: (3 pts each)
   1. JPanel = Creates a new layout within a JFrame. Buttons can be put within a JFrame.
   2. Event = Detects input events from keyboard or mouse to create an event work such as buttons.

1. Describe the difference between a JSP and a Servlet (4 pts)   
     
   JSP is a webpage scripting language that can generate dynamic content. JSPs run slower, it’s easier to code a JSP, JSPs can have custom tags that can call a java bean directly.

Servlets are java programs that are already compiled which also creates dynamic web content. Servlets run faster, servlets have more code, best used when there is more processing involved, there is no custom tags in servlets.

1. Explain the roles of Unit Testing, Integration Testing, Product Testing, and Deployment Testing(6 pts)   
     
     
   Unit Testing test the individual source code components, integration testing checks if the system as a whole works. Product testing is testing the program as a whole before it is deployed to other users. Deployment testing is testing the application while the program is being used by other users.
2. Explain why we use an Application class as well as an Object class when coding in Java (3 pts)   
     
   We use application and object classes for polymorphism. The functions in the object class can use the methods in the application class to execute a program.
3. What are the return types of the following methods? (1 pt each)
   1. Public static void main( String[] args)  
        
       A string array of main
   2. Private int executeUpdate()   
        
       An integer
4. Explain the purpose and function of a try-catch-finally structure. (2 pts)   
     
   Try will try the given code in the try block. Catch will catch any errors that come out of try. Finally runs even with errors in try and catch, as long as the try and catch does not crash the program.
5. Explain the difference between a float and a double (3 pts)

A float is a 32 bit floating point data type, which makes it less accurate. A double is a 64 bit floating point data type, which makes it more accurate. Floats can be less accurate when calculating decimal numbers, because a float can only handle up to about 32bits of data. A double is more accurate when calculation decimal numbers, because a double can handle up to 64 bits of data.

1. Discuss briefly the advantages and disadvantages of using version control software, such as git.. (5 pts)   
     
   Advantages: Access code from anywhere, see updates, get faster updates

Disadvantages: Anyone can access your code, branches can become out of sync, larger files can slow commitment cycles down.

1. EXTRA CREDIT: (2 pts)

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| Isaac and Albert were excitedly describing the result of the Third Annual International Science Fair Extravaganza in Sweden. There were three contestants, Louis, Rene, and Johannes. Isaac reported that Louis won the fair, while Rene came in second. Albert, on the other hand, reported that Johannes won the fair, while Louis came in second.  In fact, neither Isaac nor Albert had given a correct report of the results of the science fair. Each of them had given one correct statement and one false statement. What was the actual placing of the three contestants? |