Tough Questions

1. Describe the difference between overloading and overriding in an inheritance situation.
2. Suppose a base class contains a default constructor. Can you call it explicitly from within a derived class constructor?
3. Within a child class you can call a parent class method using the keyword super, a dot, and the method name. Can you also call a parent method using the parent class name, a dot, and the method name? Why or why not?

"Car Objects"  Please respond to the following:

* Suppose you are creating a program to create instances of different types of cars. Discuss the primary manner in which you would apply inheritance to the task at hand. Provide one (1) example of an instance of a car to support your response.

I would take advantage of Inheritance which is a process of defining a new class based on an existing class by extending its common data members and methods. I would use a parent class of the car superclass to have all the attributes and method which can be extend to the other classes of different cars types. Therefore, I can reuse the code of the parent’s car methods such as the wheels which can be moved by the move method. This can help to improves reusability of codes in my application

* Determine the overall manner in which the application of inheritance helps to reduce the workload on a computer programmer. Include one (1) example of a scenario or situation to support your response.

The use of inheritance help programmer to save their time of write more lines of codes by extend the methods from the superclass to the subclass. Moreover, the use of inheritance is for deriving classes using existing classes, which provides reusability. The derived classes extend the properties of super classes to generate more dominant objects. In addition, it gives they programmers the ability to write less lines of codes on any big project which can take long time to write.

"Car Classes"  Please respond to the following:

* Suppose you have created a program that creates instances of different types of cars. Ld cNow you are creating a program that keeps track of different types of cars. Choose the abstract classes and concrete classes that you would like to use within the program in question. Provide at least one (1) example of each type of class and a description of each class’s function to support your choices.

I created an abstract class of a Car superclass that keeps track of different types of cars. It has power Source, wheels, price and the doors fields. It has a set method for the program and the get method which is in the program below. Then I created a Jeep subclass which inherit some of the data from the Car parent. The program set the price using the method shown below. In addition, it forces the users to enter the price which is below 20000 and the 20000 is the maximum amount which can be enter.

public abstract class Car{  
  private String powerSource;  
  private int wheels;

private int doors;  
   protected int price;  
   public Car(String powerSource, int wheels, int doors)  
   {  
      setPowerSource(powerSource);  
      setWheels(wheels);

set Doors(doors);  
      setPrice();  
   }  
   public String getPowerSource()  
   {  
       return powerSource;  
   }  
   public int getWheels()  
   {  
       return wheels;  
   }

   public int getDoors()  
   {  
       return doors;  
   }  
  
   public int getPrice()  
   {  
       return price;  
   }  
   public void setPowerSource(String source)  
   {  
       powerSource = source;  
   }  
   public void setWheels(int wls)  
   {  
       wheels = wls;  
   }

   public void setDoors(int drs)  
   {  
       doors = drs;  
   }  
  
   public abstract void setPrice();  
}

public abstract class Jeep extends Car  
{  
   public Jeep()  
   {  
       super("a person", 2);  
   }  
   public void setPrice()  
   {  
       String entry;  
       final int MAX = 20000;  
       entry = JOptionPane.showInputDialog  
        (null, "Enter Jeep price ");  
       price = Integer.parseInt(entry);  
       if(price > MAX)  
           price = MAX;  
   }  
   public String toString()  
   {  
       return("The Jeep is powered by " + getPowerSource() +  
          "; it has " + getWheels() + " wheels” + getDoors() + “ doors and costs $" +  
          getPrice());  
                 
     
   }  
  
}

* Using the scenario from Part I of this discussion, determine at least one (1) abstract method and at least one (1) non-abstract method that you would like to use in the program that you are creating. Include one (1) example of the application of each method to support your response.

The abstract method I would use is the setPrice() which is the abstract in the parent to setup the price for the Jeep and I would use the set Doors(doors) method which is the non-abstract method.

abstract method ------------ setPrice()  
non-abstract method---------- set Doors(doors)

"Try / Catch Blocks"  Please respond to the following:

* Imagine you are working on enhancement for a social network Website. Determine at least two (2) types of errors that may occur and could be caught by try / catch blocks.  Include one (1) example of such errors to support your response.
* Based on the example that you have provided from Part I of this discussion, explain the importance of catching the error, as opposed to letting the user experience the error. As the programmer, decide the next step that you would take in order to best handle this situation after catching the error. Provide a rationale to support your response.

## Looking at the Facebook page, there are some errors which can be created by the user because not everyone knows how to use Facebook. I would put some rules on what to enter on the login screen. I would catch some error in the password if some users enter the numbers only, then I would output the message that no number is allowed. In addition, I would allow some picture types to be uploaded to the site such as jpg, ping, and others which would be specified. If a user uploads other types, I would catch that and display the message of informing them.

## Programs are built to do what is planned to do and the rules which must be followed.  Therefore, those rules which are not followed can be some exceptions which help to separate error-handling programs from the regular one. On this social media, the exceptions provide the means to separate the details of what to do when something out of the ordinary happens from the main logic of a social media program. Therefore, as the programmer, I would display an informative message to the user if they enter invalid data to help them enter acceptable data. It would help them to understand the rules of the site.

"Files"  Please respond to the following:

* Suppose you are creating a program to monitor a vehicle’s location, a feature that a Global Positioning System (GPS) provides. Suggest one (1) method for saving and organizing the data you received from GPS so that you may analyze that data during the creation of the program in question. Provide a rationale to support your suggestion.
* Using the scenario from Part I of this discussion, give your opinion as to why the Java language chooses to treat file data as a stream rather than as a single object, and specify the main benefits of this approach. Next, analyze the main reasons why the Java language chooses to treat file data as a stream rather than as a single object. Justify your response.

One method I would do is record the positions of the car in and save the data in a file which can be used later for making the program. This data is easy to use because it is saved in a file and can be backup in many locations which can reduce the potential for data loss. In addition, the data be easy retrieve from the file because it is saved permanent.

Java treat the file as stream, which is a representation of flow of data from one side to another because it flows from disk to memory and from memory to disk. The benefit of this approach of streaming data processing is new, dynamic data is generated on a continual basis. And java work perfect on this approach of stream of data. In addition, it uses a stream to either read data items from a source or to write data items to a destination.

Multimedia in Business"  Please respond to the following:

* Review the main states of the JApplet life cycle, discussed in Chapter 17 of your textbook. Next, give your opinion on the main state that you believe consumes the most resources (e.g., CPU time, memory, network bandwidth, etc.) Provide a rationale to support your response.
* Compare and contrast the key similarities and differences between the creation of a Java applet and the creation of a regular Java application. Next, suppose a client asked you to implement a business function using Java. Decide if you would implement the business functionality using a Java applet or a Java application. Justify your response.

###### The life cycle of JApple can be in four methods which are as follows

###### Init(). This method is intended for whatever initialization is needed for the applet and it is called after the param tags inside the applet tag have been processed.

###### Start().This method is automatically called after the browser calls the init method and it is also called whenever the user returns to the page containing the applet after having gone off to other pages.

###### Stop(). This method is automatically called when the user moves off the page on which the applet sits. It can, therefore, be called repeatedly in the same applet.

###### Destroy(). This method is only called when the browser shuts down normally. Of these methods, I think the one which consumes a lot of memory, CPU time, and network bandwidth is the start methods because of the reason which is explained above.

###### An applet is a Java program that runs in a Web browser. Moreover, it can be a fully functional Java application because it has the entire Java API at its disposal. The differences between an applet and a Java application are the applet is a Java class that extends the java.applet.Applet class while the java application is an application which has a main() method which is not invoked on an applet, and an applet class will not define main(). On the other hand, the java application and the applet both have a .java extension. On the point of business function, I would go for java because it is the foundation for most networked applications and is considered to be useful for scripting, web-based content, enterprise software, games and mobile applications.

"GUI Elements"  Please respond to the following:

* Imagine that you are creating an interface for a social networking application (app) that allows a user to send a short text message to a selected group of friends. Determine the main Swing components that you would use in order to make this happen. Justify your response.
* Using the scenario from Part I of this discussion, suggest one (1) method that you could use in order to make the message reception more private. Determine the key Swing components that you would use in order to make this happen. Provide a rationale to support your response.

#### An application that allows a user to send a short text message to a selected group of friends can be done by using JFrame which can be done by import javax.swing.JFrame and import javax.swing. This would make it easy to use JFrames which are swing components. This swing component is a part of a graphic user interface (GUI). Frames, windows, text boxes, buttons, switches and many other parts of a GUI application. I would use the texts boxes for the message to be send to the group of friends using the send buttons to send or cancel the message by clicking on them. I would also use the input from the keyboard for the user input.

#### To make the message reception more private so that some users cannot get access to it, the key Swing components which I would use is the JPasswordField class which is a subclass of JTextField that provides specialized text fields for password entry. The JPasswordField would open on another window requesting a receiver of the massage for the password before reading it. Therefore, the message cannot be read by anyone without the password which would make it more private.

"Graphical User Interface (GUI)"  Please respond to the following:

* It is common knowledge that the mouse is convenient for interacting with various parts of an application that uses a graphical user interface. Argue for or against this statement: A developer should always design an application with a GUI whose interactions support the use of a mouse. Provide a rationale and one (1) example of such application to support your response.
* Imagine that you are using Java to design a user interface. Suggest one (1) strategy that you would use to determine the combination of JPanels and LayoutManagers that would give you the desired layout. Provide a rationale to support your response.

#### Graphical user interface is a type of user interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary notation. The use of a mouse to interact with the application makes it easy in many ways .The Mouse makes the accelerated movements, which are the ability to have a non-linear relationship between the speed of moving the pointing device and the on-screen pointer: In addition, moving the mouse fast makes the on-screen pointer move even faster Also mice provide a more natural sense of movement that makes it more useful and they are also easier to use for some people with certain disabilities. Therefore, A developer should build GUI application which can use the mouse which would be better for most users.

#### JPanel is a Swing's lightweight container which is used to group a set of components together. While the Layout Managers are used to arrange components in a particular manner. In addition, it is an interface that is implemented by all the classes of layout managers. Therefore, you use the jpanal to put the component with the layout Manager which organized everything together that would result in a better outcome.

Graphics"  Please respond to the following:

* Determine the main attributes that you believe a good GUI designer possesses. Next, give your opinion as to whether or not GUI designers also have to be quality programmers. Justify your response.
* Imagine that you are using Java to design a user interface. Propose a strategy that you would use in order to use graphics to design the overall look and feel of the application that you are designing. Next, suggest the main steps that you would take in order to ensure that your finished program follows the design and modeling of your prototype. Justify your response.

#### Graphics is the Graphics object, which contains all the things needed to do drawing within Java. In my opinion, a good GUI designer should have first all, communication skills because the type of work that is a service to clients will always require communication between the service provider and the client. As a client service, there is plenty of back and forth communication for the client to the designer. There will be very few design projects that will allow you to go work on your own and then present a finished product to a client without much communication in during the process. For a GUI designer, coding and creativity are a part of the everyday work, and so is communication. Second, the designer should be flexible because, the client may like the product today and change their mind tomorrow, therefore, he should be able to easily change without a problem

#### In addition, a GUI designer must be quality programmers because it will put them on an advantage. For someone to be better, he would need to have high combination of skills for him to be successful.

#### On the point of a proposed strategy that I would use is to use graphics to design the overall look and feel of the application that I can design can be explain in many ways. The most important thing to do is to include library in the program which will make it easy to design application. And the final thing to take into consideration is to test the program which will show you the result of your design. If you don’t like them, then you can change the design by changing some few staff.

"Multithreading"  Please respond to the following:

* In most cases, multithreading is a better choice than single threading. Describe one (1) situation in which a single threaded application is a better choice than an application that uses multithreading. Provide a rationale for your response.
* Describe one (1) situation, not mentioned within the reading, in which it is preferable to use the sleep method on a thread as opposed to a suspend method on a thread. Justify your response.

#### Multithreading is the inclusion of more than one unit of execution in a single process. In addition, multiple simultaneous calls can be made from the same process. A single threaded application is a better choice than an application that uses multithreading because it is easy to write which doesn’t require an experienced programmer to code these types of applications. In addition, it is easy to debug a single thread for instance, if you build the single thread application, it will take less time to find the error than the multithread program which is much harder to replicate an error than it is to do so in a single-threaded. Also, it is more difficult, in the latter case, to identify and verify root causes when errors occur.

#### **A sleep thread method is a static method, which means that it is always affecting the current thread (the one that is executing the sleep method). While a** suspend thread, method**is deprecated. Using it is possible to halt a thread other than the current thread. In addition, it keeps all its monitors and since this state is not interruptible it is deadlock prone. Therefore, the sleep thread method is preferable because** It always pause the current thread execution. And the actual time the thread sleeps before waking up and its start execution depends on system timers and schedulers. In addition, this thread doesn’t lose any monitors or locks current thread.

* *Difficulty of writing code*

Multithreaded and multicontexted applications are not easy to write. Only experienced programmers should undertake coding for these types of applications. For instance, if you build the single thread application, it will take less time to find the error than the multithread program which is much harder to replicate an error than it is to do so in a single-threaded. Also, it is more difficult, in the latter case, to identify and verify root causes when errors occur.

* *Difficulty of debugging*

It is much harder to replicate an error in a multithreaded or multicontexted application than it is to do so in a single-threaded, single-contexted application. As a result, it is more difficult, in the former case, to identify and verify root causes when errors occur.

* *Difficulty of managing concurrency*

The task of managing concurrency among threads is difficult and has the potential to introduce new problems into an application.

* *Difficulty of testing*

Testing a multithreaded application is more difficult than testing a single-threaded application because defects are often timing-related and more difficult to reproduce.

* *Difficulty of porting existing code*

Existing code often requires significant re-architecting to take advantage of multithreading and multicontexting. Programmers need to: