**Chapter 6b - Review Questions**

1. **Define polymorphism, and give an example.**

* Polymorphism is the concept that one message can give different meanings to different objects. This means that the same message given to two different objects may produce two different results. For example, if a message saying “Time for practice” were sent to a baseball player object and a cello player object, the baseball player might start fielding groundballs, whereas the cello player might start playing scales on their cello.

1. **Define a class, subclass, and superclass, and give examples.**

* An object belongs to a group or category called a class which share common attributes and methods. An example of these might be EMPLOYEE or VEHICLE. A more specific category within a class is called a subclass. Examples of a subclass would be MANAGER or CAR. These share some attributes with the class they belong to, but may also have some unique traits as well. The superclass is a more general category that objects may fit into. For example, PERSON and TRANSPORTATION would be considered super classes. Under the PERSON superclass, you could have many classes such as EMPLOYEE and numerous subclasses such as MANAGER or INSTRUCTOR that would fall under the EMPLOYEE class.

1. **Define an actor, and give an example.**

* In use case modeling, an external entity known as an actor initiates a use case by requesting the system to perform a function or a process. In our Personal Trainer Inc. examples, the MEMBER would be an example of an actor and SCHEDULE TRAINING CLASS would be the use case (process/function) he or she initiates.

1. **Define a use case and a use case diagram, and give examples.**

* A use case represents the steps in a specific business function or process. In question number 8, the member scheduling a training class generated a use case. The use case diagram is a graphical representation of several use cases within a system. Using the same example, the use case diagram would show the different actors (member, trainer, manager, etc.), the relationship between the different actors involved and the steps each one must take within the use case to accomplish the specific processes or functions the initial actor generated.

1. **Define the term black box, and explain why it is an important concept in object-oriented analysis.**

* An object can be viewed as a black box, because a message to the object triggers changes within the object without specifying how the changes must be carried out. An example of this is a supermarket checkout area. When you scan the item at the register, you aren’t concerned with how the system knows what the item is or its cost, just that it is correct and you are not overcharged. All data and methods are self-contained in a black box which in turn limits access to the internal processes. By limiting the access to these processes, the internal code is protected from being altered by another object or process. This allows the object to be used as modular components anywhere within the system.

**Chapter 6b - Personal Trainer, INC**

1. **Create a sequence diagram for the use case that you selected.**

* See attached sequence diagram

1. **Create a state transition diagram that describes typical patient states and how they change based on specific actions and events.**
   * See attached state transition diagram

**Chapter 6b - Case in Point 6.3: TRAVEL BIZ**

I would have to agree with Lisa in this situation in order to create a flexible and efficient information system. There is already an existing model within the company for their business travel model. The team could utilize that existing model to use as a base for the vacation travel side. The object-oriented method allows for a much more interactive approach and will help get to a working model quicker and efficient. Also, the actual object from the business model is a black box, so it can be implemented throughout this process without changing the initial object. In this case we are not re-inventing the wheel and we have a good point to start, so object-oriented methodology seems like the best option for the new IT division.