Your Name: _____   TA's Name: _____
ID#:   _____   Section #:   _____

SOLUTION: Take Home: Quiz 4 (15 pts) – C++, Data Structures, and OOP

Using Blackboard Learn https://learn.wsu.edu/webapps/login/ submit your quiz. You will submit your assignment in the *lab* Blackboard space. Under the "Content" link navigate to the "Quiz Submissions" folder and upload your solution to the appropriate "Quiz" space. You must upload your solution, through an attachment, as <your last name>_quiz4.pdf by the due date and time.

1. (4 pts) In your own words, what is a *copy* constructor?

A copy constructor makes a *copy* of an object of the same type. A copy constructor is *implicitly* invoked when an object is *passed-by-value*! A *shallow* copy is made if only the data members are copied directly over to the object. A *deep* copy is made if new memory is allocated for each of the data members. For example, if we have a linked list of nodes that were allocated on the heap, to make a *deep* copy we would need to allocate new nodes and copy the data from the first list's nodes into the newly allocated nodes belonging to the second list. A *shallow* copy would just copy the head pointer member of the first list into the head pointer member of the second list.

3. (4 pts) In your own words, what is *encapsulation*?

Encapsulation is a way of organizing or wrapping of data/attributes and methods/operations into a structure (or capsule). Objects naturally impose encapsulation – attributes and operations are closely tied together.

3. (4 pts) In your own words, what is the *rule of three* or the Law of Three?

The rule states that if one or more of the following are defined, then all three should be explicitly defined:
- **Destructor**
- **Copy constructor**
- **Copy assignment operator**

4. (3 pts) In your own words, what is a *function overloading*?

The capability to define more than one function with the same name as long as these functions have a different set of parameters, including number and/or types.