EECS1720
Worksheet 2 – Class Basics + Aggregation & Composition

1) What is the HAS-A relationship between two objects?

   a) a relationship where one object "is associated" another object B.
   b) a relationship between abstractions wherein one class is a subclass of another class C.
   c) a relationship between the type of an object and an instance of the type D. d) something else

2) What is aggregation?

   a) a relationship where one object A "is associated" with another object B, however B may exist independently from the object A
   b) a relationship where an object A is a specialized “version” of another object B, and assumes all attributes and fields from the other object B
   c) a relationship where one object A "belongs to" another object B, and A may only exist as a part of B
   d) something else

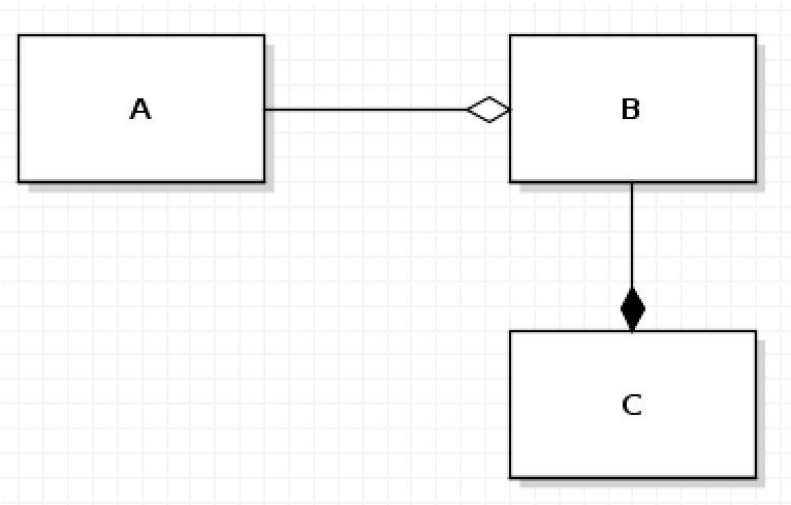
3) Why is composition sometimes necessary?

   a) To ensure that an object remains fully accessible to a client and may be modified whenever, and however the client sees fit
   b) To avoid unwanted sharing of memory between different reference variables that a client may have access to in an application
   c) To ensure that an object does NOT have ownership over another object
   d) None of the above

4) A utility class is a class that:

   a) Has only methods defined
   b) Has only fields defined
   c) Has only static features (methods/fields)
   d) Has only non-static features (methods/fields)

5) The diagram below describes several relationships between classes, which of the following best describes these relationships?



a) A is an aggregation of B, and C is a composition of B
b) A is a composition of B, and C is an aggregation of B
c) B is an aggregation of A and an aggregation of C
d) B is an aggregation of A and a composition of C
e) C is an aggregation of B, and B is a composition of A
f) C is a composition of B, and B is an aggregation of A

6) A custom constructor

a) Is a constructor that accepts as its argument, another object of the same class that is currently being constructed
b) Is a constructor that accepts any arbitrary (non-empty) list of arguments
c) Is a constructor that has no arguments
d) None of the above

7) If a field or method has a private access modifier, then:

a) The field/method is accessible within the constructors of the class in which it is defined, but nowhere else
b) The field/method is not directly accessible to a client, however it is accessible to any method within the class in which it is defined
c) The field/method is not directly accessible to a client, however it is accessible to any method or constructor within the class in which it is defined
d) The field/method is accessible to any constructor or method within the class in which it is defined, and externally to any client using the class

8) An overloaded method is a method that:

a) has the same name, but different signature as another method in the same class
b) has the same signature, but different name as another method in the same class
c) returns more than one value
d) performs the same function as a constructor within the class

9) The term "encapsulation" refers to:

a) The fact that an object can be instantiated from a class
b) The bundling of both data and methods together into a single unit (instantiated as an object, where the methods are configured to allow/ not allow access to fields)
c) The concept of associating more than one class together into a single object
d) Giving a client direct access to the modify the fields of an object without using methods defined for that class

Implementing Classes

10) Choosing fields:

For each of the following kinds of values, choose appropriate fields to represent the value (imagine you are trying to implement a class that represents the value). Try to come up with two alternate sets of fields that could represent each kind of value.

a) weight

b) temperature

c) time of the day

d) day of the year

11) Default constructor:

a) Suppose that a Temperature is represented as a floating point value in degrees Celcius. Implement a default (no argument) constructor.

b) Suppose that a TimeOfDay is represented as an integer hour and an integer minute. Implement a default (no argument) constructor.

12) Custom constructor:

a) Suppose that a Temperature is represented as a floating point value in degrees Celcius.

Implement a custom constructor that initializes the temperature given a value in degrees

Celcius

b) Suppose that a TimeOfDay is represented as an integer hour and an integer minute. Implement a custom constructor that initializes a time given an hour and a minute.

13) Copy constructor:

a) Suppose that a Temperature is represented as a floating point value in degrees Celcius. Implement a copy constructor that initializes the temperature given another Temperature reference.

b) Suppose that a TimeOfDay is represented as an integer hour and an integer minute. Implement a copy constructor that initializes a time given another TimeOfDay reference.

14) Implement a setter (mutator) method:

c) Suppose that a Temperature is represented as a floating point value in degrees Celcius. Implement a set method that sets the value of a temperature given a value in degrees Celcius.

d) Suppose that a TimeOfDay is represented as an integer hour and an integer minute. Implement a set method that sets the value of a time given an hour and a minute.