CS Teaching Academy
Activity 6B: OOP and Design

Why?

The most important part of object oriented programming is good design. Creating proper abstractions with appropriate inheritance is an essential step in the process of writing object oriented code.

Vocabulary:

procedural decomposition, abstraction, inheritance, encapsulation, data hiding, polymorphism

Key Questions (answer individually, then check answers with your teammates):

1. What is the difference between a class and an object?
2. How is polymorphism related to inheritance?

Exercises (answer as a team, then check with the instructor):

1. Why is there one instance of methods for each class, and one instance of the attributes for each object?
2. Which of these is not a subclass of "Vehicle"? Truck, Motorcycle, Wheel, SUV, Sedan

Problems (answer as a team, then write your answers on the board:

Application: You are designing an information system for photo sharing. You application will allow users to post their own photo albums, share them with others, and view albums that have been shared with them.

1. Perform a procedural decomposition for the application.

Identify 8-12 key functional modules that will be required to carry out the application. You can proceed top-down or bottom-up in identifying modules. Tie them together in a hierarchical structure chart (upper level procedures use lower level procedures).

2. Now perform an object-oriented design for the same application.

First, identify 8-12 key abstractions (classes) for the application. Show how they are related through inheritance where appropriate.

Then, pick two of the key abstractions and list their attributes and methods, that is, the instance variables and procedures that will be necessary to support that abstraction in the application.