Lab 9: C++
Composition and Inheritance

Turn in a zip or tar file containing:

1) Time.h
2) Time.cpp
3) WorldTime.h
4) WorldTime.cpp
5) TimeTest.cpp
6) makefile

- Download Time.h, Time.cpp and WorldTime.h from Canvas.
- The Time class in this assignment doesn't use exceptions, so omit the "throw", "try", and "catch" statements from the examples in pages 639 – 641.
- Implement the rest of the functions in Time.cpp.
    - print12HourTime – same as the printStandard function on page 640
    - print24HourTime – same as the printUniversal function on page 640
- Compile only Time.cpp and debug as needed until it compiles correctly.
- Create TimeTest.cpp. In the main function, instantiate two or three Time objects, test the accessors, mutators, and both print functions.
- Create a makefile. Insert commands to compile and link Time.cpp and TimeTest.cpp and produce an executable called TimeTest.
- Compile and run TimeTest.cpp. Debug as needed.
- Implement WorldTime.cpp. You will need to include "Time.h"

  WorldTime is a derived class. It inherits from the base class Time using public inheritance.

  - public members of class Time are inherited by class WorldTime and are public members of class WorldTime

- private members of class Time are inherited by class WorldTime. However, they are not directly accessible by WorldTime functions. You must use the accessors and mutators.

- WorldTime will have one new private data member, timeZone

- WorldTime will have several new public member functions:

  1) constructor

     explicitly call the Time class constructor, then call the mutator for timeZone

  2) accessor and mutator for timeZone

     The mutator should perform data validation. Valid timeZone strings for the purpose of this lab assignment are:

EDT	MDT
EST	MST
CDT	PDT
CST	PST

  3) print12HourTime example: 03:06:00 PM CDT

  Inside the print12HourTime function you may call the function from the Time class within these functions by using a call like this:

     ```
     Time::print12HourTime( );
     ```

  4) print24HourTime example: 15:06:00 CDT

- Compile only WorldTime.cpp and debug as needed until it compiles correctly.

- Modify TimeTest.cpp. Add statements to instantiate two or more WorldTime objects, test the accessor, mutator, and both print functions.

- Modify your makefile. Add a command to compile WorldTime.cpp and change the linking command so that it includes WorldTime.o.

- Run and debug as needed.

- When everything works correctly, create a Zip or Tar file. I use a program called 7Zip on Windows. The **zip** command is available on Linux.