**Chapter 5, Basic OOP Homework**

The purpose of this homework is to practice using packages, classes, custom constructors, static variables, static methods, and a deep copy function to improve your solution for the long homework in Chapter 4, Connecting the Testbench and Design. Expand on this solution by:

1. Creating a package block to contain a new Transaction class. This class will replace your structure. The Transaction class will have the following methods:
   1. Custom constructor to assign a random value to class variables *address* and *data\_in*
   2. Function *print\_data\_out* to print out the time and class variable *data\_out*
   3. A static class variable *error*.
   4. A static function to print out the time and static class variable *error*
   5. Function to check class variable *expected\_data* with class variable *data\_out* and increment static class variable *error* if they don’t match.
   6. A deep copy function for class Transaction

Notes

1. Your variable names may not match these, they are for reference only.
2. Your interface will not change and module top will not change.

Deliverables:

1. Code for the package
2. Code for program test using the Transaction class
3. Waveform showing at a minimum the I/O of the memory model, error counter from the class, and assertion failure for a 0 delay my\_mem model and transcript file reporting 0 memory read errors and at least 1 assertion failure.