**Design Patterns**

**Homework 1**

* (10 points) Enter, compile, and execute the following C++ program.  
   #include <iostream>  
  using namespace std;  
  int main( int argc, char \*argv[] )  
  {  
   cout << "Hello World!\n";  
  }
* (40 points) Write a class, called  *Stack*, in a file called Stack.h, that implements a stack of up to 1000 characters. You should include the following member functions in your class.  
   #define STACK\_CAPACITY 1000  
   class Stack  
   {  
   public:  
   Stack(); // constructor for a stack  
   void push( char c ); // adds c to the top of the stack  
   void pop(); // removes top element  
   char top(); // returns the top element  
   bool isEmpty(); // returns true iff the stack is empty  
   ~Stack(); // destructor for a stack  
   };
* (30 points) Write a main procedure, in a file called main.cpp, that repeatedly reads a character string from  *cin* into a string variable and outputs the reverse by pushing the characters onto an instance of your stack class, then printing them as they are removed from the stack.
* (20 points) Modify your program to exit on end of file (when the user types a ^D, on unix, or ^Z, on the Windows).