**Chapter 5 Exercise**

**Pipe and Filter Software Architecture**

Directions: Write a program in Java that shall demonstrate a pipe and filter architecture. The filters shall consist of functions that perform operations on a character array. The pipes shall be simulated by the main() function calling one function and passing the array parameter to each function in turn. Use only one Java source code file for this program.

The program shall start by obtaining a character phrase from the user. The program shall do this by either accepting the input as a command line entry or by prompting the user to enter phrase if no command line entry is present. The main() function shall then copy the contents of the character phrase into a character array.

The main() function shall then pass the array to the first function named changeToUpperCase() that shall convert each character in the array from lower case to upper case.

The main() function shall then pass the resulting array to the second function named reverse() that shall reverse the contents of the array.

The main() function shall then pass the resulting array to the third (and last) function named advanceOneCharacter() that shall advance each character by one in its ASCII value.

The main() function shall then print the contents of the resulting character array, which has gone through three conversion functions one by one. For example, the input phrase “abcd1234” shall result in an output of “5432EDCB”.

Submit your completed Java source code file on the course website.