**HW3**

1. Define a class named PrimeNumber that stores a prime number. The default constructor should set the prime number to 1. Add another constructor that allows the caller to set the prime number (make sure that the new number is a prime number). Also add a function to get the prime number. Finally, overload the prefix and postfix ++ and -- operators so they return a PrimeNumber object that is the next largest prime number (for ++) and the next smallest prime number (for --). For example, if the object’s prime number is set to 13, then invoking ++ should return a PrimeNumber object whose prime number is set to 17. Create an appropriate test program for the class.
2. Do Programming Project 6.10, the definition of a Temperature class, except overload ==, << and >>. The == operator should return true if the two temperature values are identical while << should output the temperature and >> should input the temperature. Create appropriate tests for the overloaded operators.

**Note:** The first printing of this question erroneously stated to overload ==, ≪, and ≫ as member operators. As described in the book, this is not really possible to get the desired effect.

1. Write a program that outputs a histogram of grades for an assignment given to a class of students. The program should input each student’s grade as an integer and store the grade in a vector. Grades should be entered until the user enters -1 for a grade. The program should then scan through the vector and compute the histogram. In computing the histogram the minimum value of a grade is 0 but your program should determine the maximum value entered by the user. Use a dynamic array to store the histogram. Output the histogram to the console.

Output the histogram count at the end. For example, if the input grades are 3, 0, 1, 3, 3, 5, 5, 4, 5, 4, 6, -1 then the program should output

1 grade(s) of 0

1 grade(s) of 1

0 grade(s) of 2

3 grade(s) of 3

2 grade(s) of 4

3 grade(s) of 5

0 grade(s) of 6

Output the histogram count at the end. For example, if the input grades are 3, 0, 1, 4, 3, 4, 3, 3, 0, -1 then the program should output

2 grade(s) of 0

1 grade(s) of 1

0 grade(s) of 2

4 grade(s) of 3

2 grade(s) of 4

1. Create a class named Student that has three member variables:

name – A string that stores the name of the student

numClasses – An integer that tracks how many courses the student is currently enrolled in

classList – A dynamic array of strings used to store the names of the classes that the student is enrolled in

Write appropriate constructor(s), mutator, and accessor methods for the class along with the following:

 A function that inputs all values from the user, including the list of class names. This method will have to support input for an arbitrary number of classes.

 A function that outputs the name and list of all courses.

 A function that resets the number of classes to 0 and the classList to an empty list.

Write a main function that tests all of your functions.

CodeMate hint: Recall that cin >> variable leaves a newline in the buffer. This can be a problem if you are mixing cin >> variable and getline. Use cin.ignore to discard the newline.