PS # 5

Deadline: 12.04.2020 at 23:50

Hand-in Policy:

Create a cpp file for each part of the assignment and save the screenshot while these parts are running.

Your assignment should consist of 3 cpp files and 3 screenshots.

Zip all files of the assignment. Your zip files should look like this

ps4_studentnumber_name_surname.zip

1)

Write the definition for a class named Vector2D that stores information about a two-dimensional vector. The class should have functions to get and set the *x* and *y* components, where *x* and *y* are integers. Next, overload the * operator so that it returns the dot product of two vectors. The dot product of two-dimensional vectors **A** and **B** is equal to

(A *x* * B *x*) + (A *y* * B *y*).

Finally, write a main subroutine that tests the * operation.

2)

Define a class named MyInteger that stores an integer and has functions to get and set the integer's value. Then, overload the [] operator so that the index returns the digit in position *i* , where *i* = 0 is the least-significant digit. If no such digit exists then –1 should be returned.

For example, if x is of type MyInteger and is set to 418, then *x* [0] should return 8, *x* [1] should return 1, *x* [2] should return 4, and *x* [3] should return –1.

3)

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. 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.