# Assignment 3 Story

We were provided MapPoly, an immutable map-based version of Liskov’s poly class, and our task was to convert this class into a mutable class.

Most of our code is the same as the code provided to us, we have only changed the methods of *sub(), add(),* and *multiply().*

A walkthrough of our code:

The constructor with no arguments that initializes a zero polynomial has been kept intact. With this, there was a second constructor with two integer parameters that initialized the polynomial c\*xn, and throws IllegalArgumentException if n<0 has also not been touched.

The method degree() returns the degree of the specified polynomial. Another method called coeff(int d) returns the coefficient of the term whose exponent is d. Here, if the value of d<0, it throws IllegalArgumentException, and if the terms in the polynomial do no contain the exponent ‘d’, it returns 0. These two functions haven’t been tampered with.

The following methods have been modified to convert this class from immutable to mutable. All of these methods throw NullPointerException if the argument object is NULL.

In the method sub(), we added a local copy of the class object to prevent modifying original object. We then copied all the terms of original object to this copy,and modified the call to the add method by changing its argument form original object to this copy of the object. This call invokes the ‘.minus()’ method which also needed modification.

We decided to get rid of the original code, and just replaced all the term values with negative values.

The method add() has been modified by first removing a new object initialization. Now we’re working with the same class object and hence we’ll return it (return this), instead of returning another class object in the case of immutable version (return result).

Similarly, in the method mul(), we removed the new object initialization, and added initialization of a TreeMap object with integers. We then modified the rest of the code in this method to populate the TreeObject with the product coefficients.