

```
//=====
// Name      : Assignment #4
// Author    : Kendrick Kwok (912351666)
// Version   : Eclipse C++ 3.8.1 – 5.1
// Date      : 4/1/16
// Description : This program asks the user to fill out a polynomial equation and
//              be able to do specific functions to this polynomial.
//              Created an ADT that is able to hold specific functionalities.
//=====
```

Problem : This program is to ask the user to fill out a polynomial equation and be able to do specific functions to this Polynomial.

I created an ADT that is able to hold specific functionalities. I created a constructor that creates an object with zero terms. ReadfromUser() reads and pushbacks the exponents and numbers into the object. Degree() returns the degree of the expression. (If expression is $x^3 + x^4$, the degree of the expression is the highest degree which is 4). ChangeCoefficient() takes the input power and changes the actual coefficient to what the user wants. MultiplyPolynomial() multiplies the polynomial by a certain integer. AddPolynomial adds two polynomials together, I overloaded the negation operator so it changes the polynomial vector into negative, and printFinalPolynomial() prints the polynomial. My ADT vector is stored like this :
[coeff][degree][coeff][degree].....

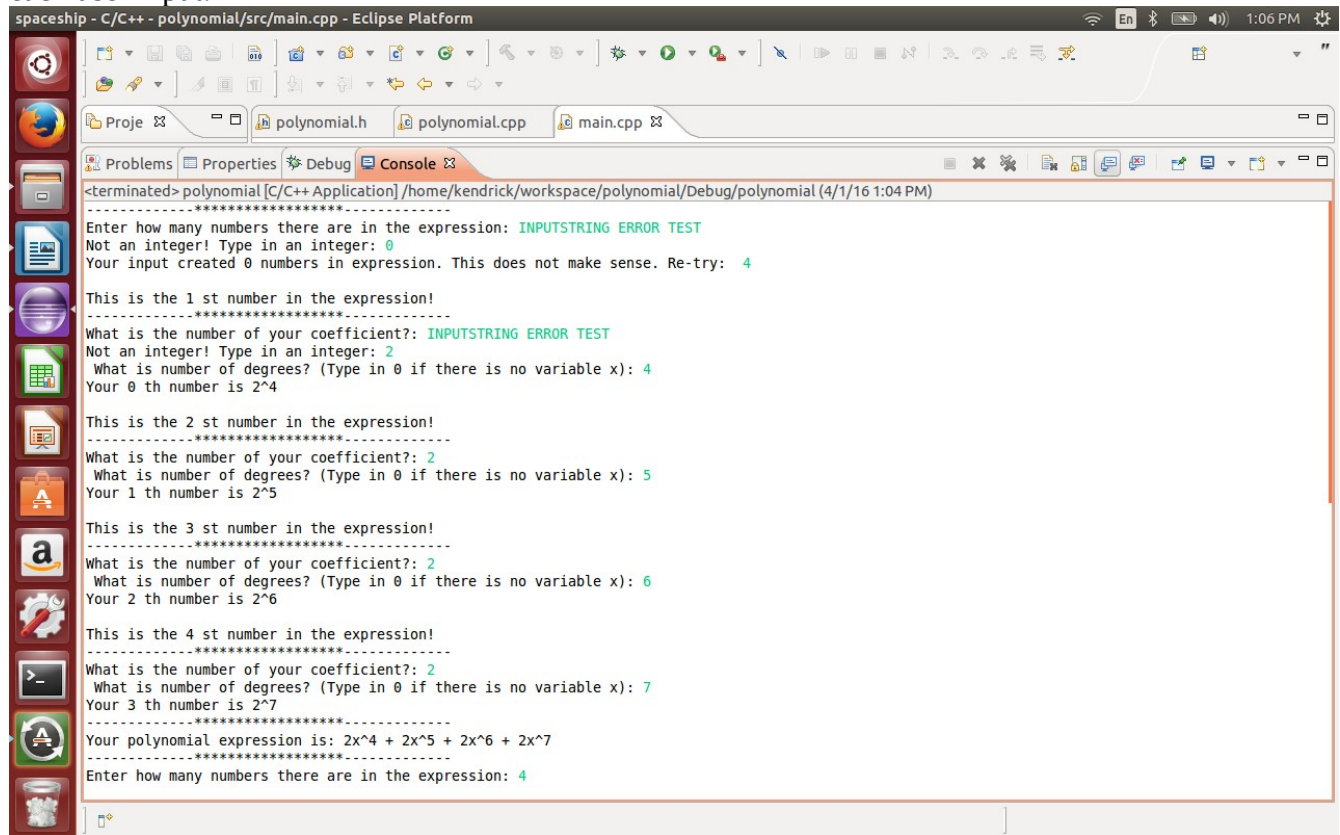
Knowing this, if I want to change the coeff, the index are even (I + I +2 + I+4...)

If I want to alter the powers, the indexes are odds (i+1, i+3, i+5)...

Below is a sample program I produced in main() that represents all my functions.

```
spaceship - C/C++ - polynomial/src/main.cpp - Eclipse Platform
13 int main(){
14
15     //Polynomial() constructor
16     Polynomial po;
17     Polynomial p;
18
19     //void readFromUser();
20     po.readFromUser();
21     p.readFromUser();
22
23     //int degree(); ---- return degree
24     int deg = p.degree();
25     cout << "The degree of this polynomial is: " << deg << endl;
26
27     //int coefficient(int); ---- return coefficient
28     int coef = p.coefficient(5);
29     cout << "Your coefficients with the user input power is " << coef << endl;
30
31     //void printFinalPolynomial();
32     p.printFinalPolynomial();
33
34     //void changeCoefficient (int, int);
35     p.changeCoefficient(10,5);
36
37     //void multiplyPolynomial(int);
38     p.multiplyPolynomial(5);
39
40     //void addPolynomial(Polynomial);
41     p.addPolynomial(po);
42
43     //Polynomial operator -();
44     -p;
45     cout << "After overloading negation, your polynomial is: ";
46     p.printFinalPolynomial();
47 }
```

Using Eclipse 3.8.1, the compilation I got for this is shown on page two . Error checking is tested for each user input.



```
spaceship - C/C++ - polynomial/src/main.cpp - Eclipse Platform
<terminated> polynomial [C/C++ Application] /home/kendrick/workspace/polynomial/Debug/polynomial (4/1/16 1:04 PM)
Enter how many numbers there are in the expression: INPUTSTRING ERROR TEST
Not an integer! Type in an integer: 0
Your input created 0 numbers in expression. This does not make sense. Re-try: 4

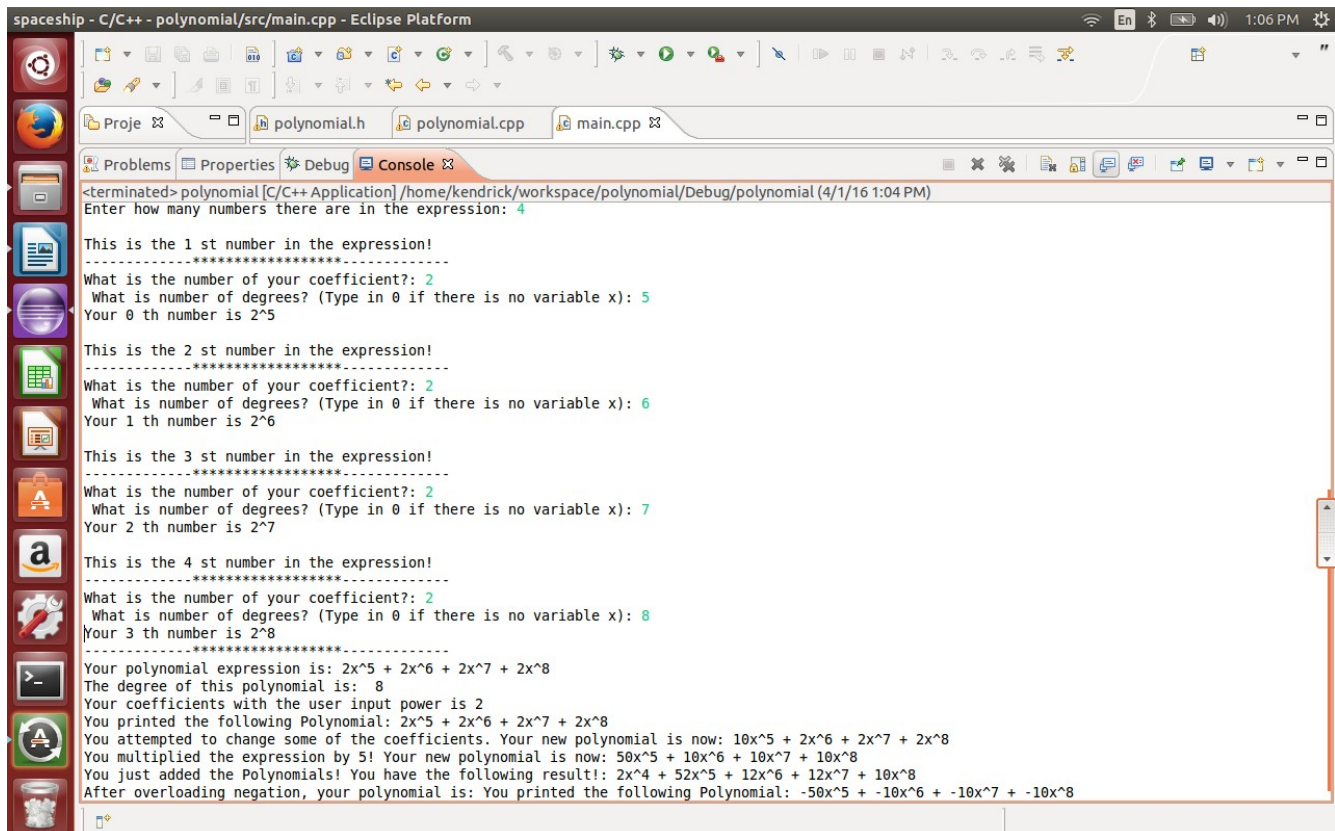
This is the 1 st number in the expression!
-----
What is the number of your coefficient?: INPUTSTRING ERROR TEST
Not an integer! Type in an integer: 2
What is number of degrees? (Type in 0 if there is no variable x): 4
Your 0 th number is 2^4

This is the 2 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 5
Your 1 th number is 2^5

This is the 3 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 6
Your 2 th number is 2^6

This is the 4 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 7
Your 3 th number is 2^7

Your polynomial expression is: 2x^4 + 2x^5 + 2x^6 + 2x^7
-----
Enter how many numbers there are in the expression: 4
```



```
spaceship - C/C++ - polynomial/src/main.cpp - Eclipse Platform
<terminated> polynomial [C/C++ Application] /home/kendrick/workspace/polynomial/Debug/polynomial (4/1/16 1:04 PM)
Enter how many numbers there are in the expression: 4

This is the 1 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 5
Your 0 th number is 2^5

This is the 2 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 6
Your 1 th number is 2^6

This is the 3 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 7
Your 2 th number is 2^7

This is the 4 st number in the expression!
-----
What is the number of your coefficient?: 2
What is number of degrees? (Type in 0 if there is no variable x): 8
Your 3 th number is 2^8

Your polynomial expression is: 2x^5 + 2x^6 + 2x^7 + 2x^8
The degree of this polynomial is: 8
You printed the following Polynomial: 2x^5 + 2x^6 + 2x^7 + 2x^8
You attempted to change some of the coefficients. Your new polynomial is now: 10x^5 + 2x^6 + 2x^7 + 2x^8
You multiplied the expression by 5! Your new polynomial is now: 50x^5 + 10x^6 + 10x^7 + 10x^8
You just added the Polynomials! You have the following result!: 2x^4 + 52x^5 + 12x^6 + 12x^7 + 10x^8
After overloading negation, your polynomial is: You printed the following Polynomial: -50x^5 + -10x^6 + -10x^7 + -10x^8
```