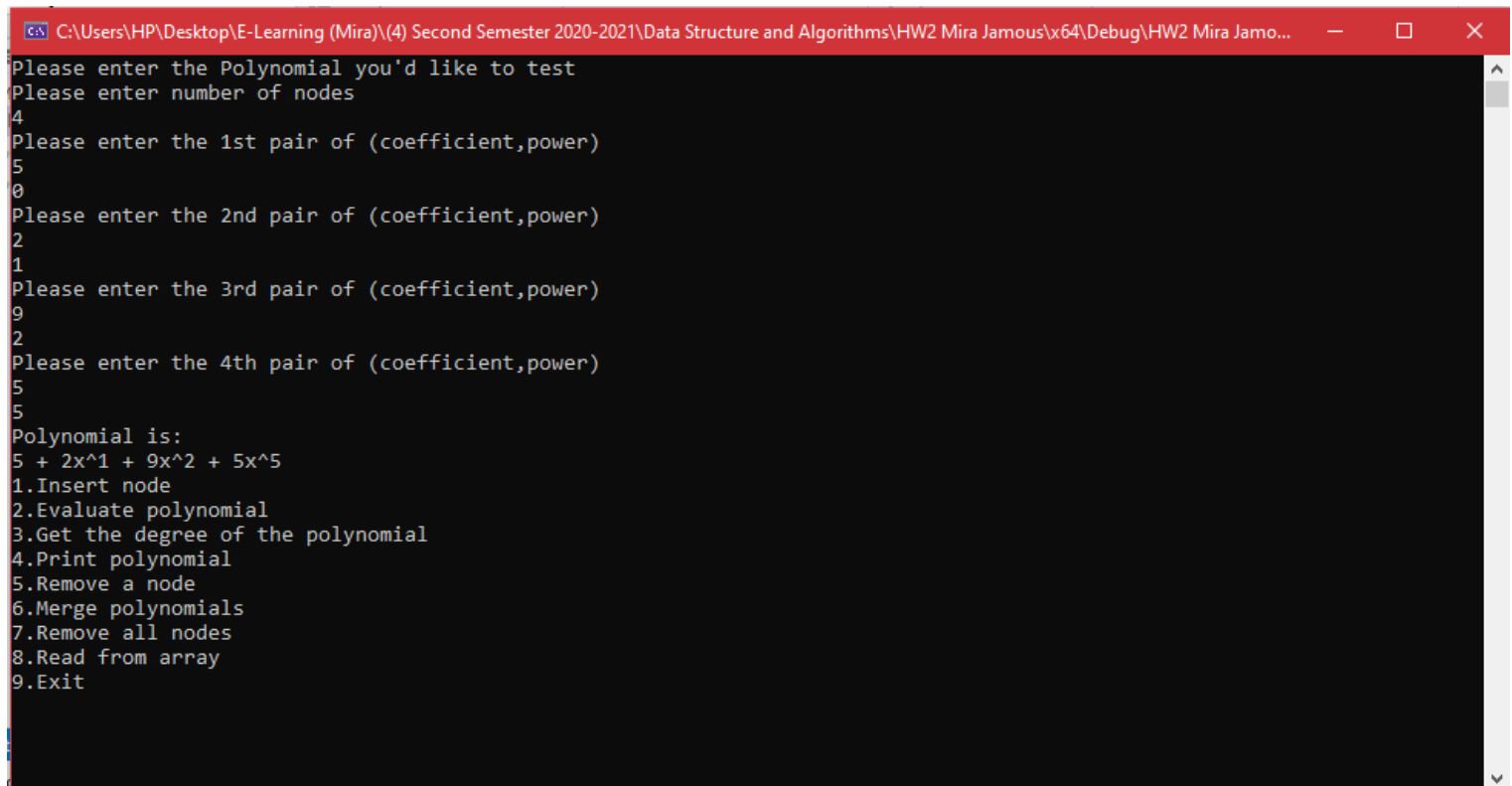


Mira Jamous 11926792 HW2 Data structure

Here is a demo of how the code works


1) The cmd asks the user to enter the poly we're gonna test



```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...  
Please enter the Polynomial you'd like to test  
Please enter number of nodes  
4  
Please enter the 1st pair of (coefficient,power)  
5  
0  
Please enter the 2nd pair of (coefficient,power)  
2  
1  
Please enter the 3rd pair of (coefficient,power)  
9  
2  
Please enter the 4th pair of (coefficient,power)  
5  
5  
Polynomial is:  
5 + 2x^1 + 9x^2 + 5x^5  
1.Insert node  
2.Evaluate polynomial  
3.Get the degree of the polynomial  
4.Print polynomial  
5.Remove a node  
6.Merge polynomials  
7.Remove all nodes  
8.Read from array  
9.Exit
```

2) Inserting a node with coefficient 3 and power 5

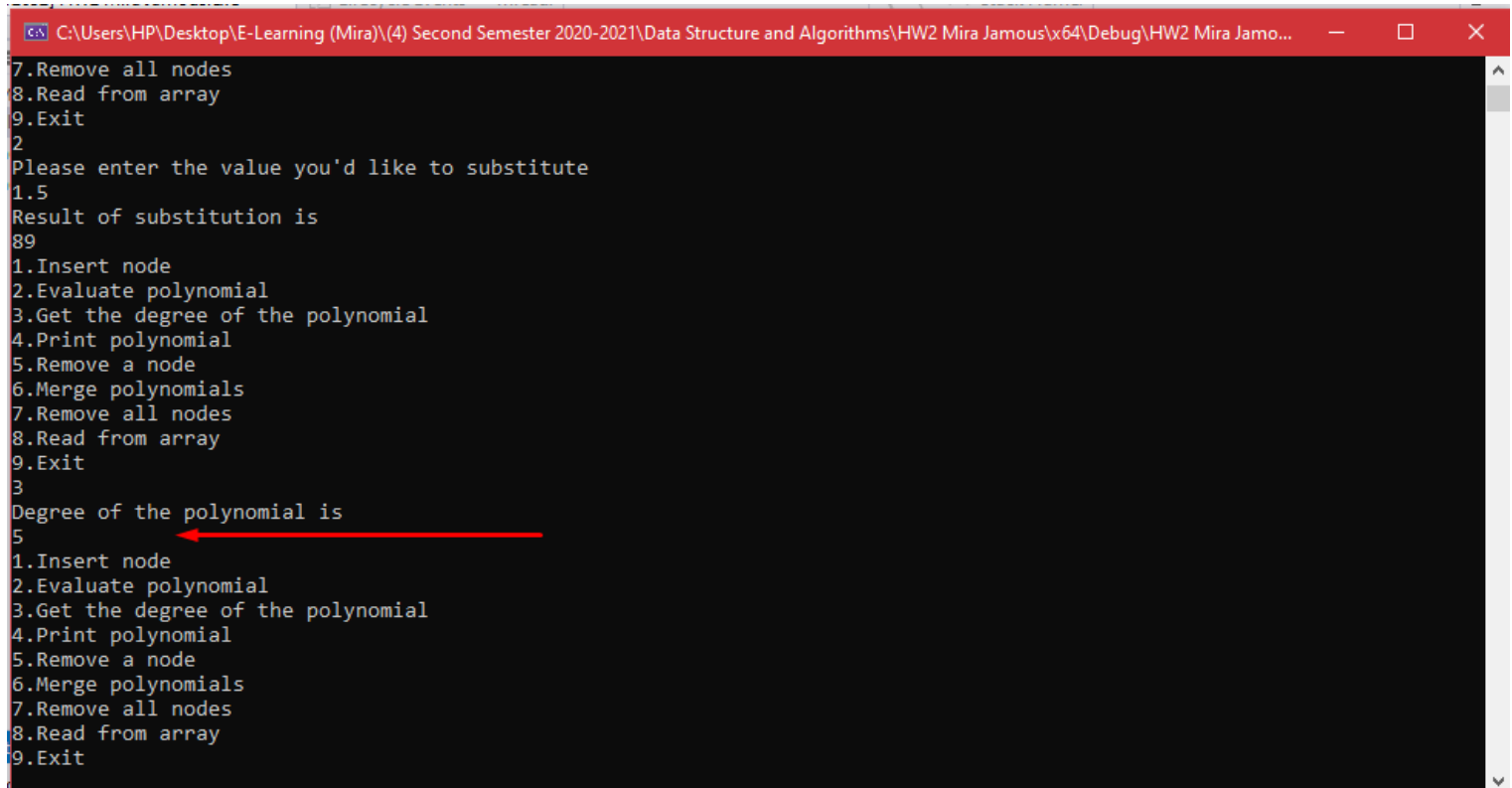
```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...
5
5
Polynomial is:
5 + 2x^1 + 9x^2 + 5x^5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
1
Please enter the coefficient first and then power (in order) of the node you'd like to insert
3
5
Poly after insertion
Polynomial is:
5 + 2x^1 + 9x^2 + 8x^5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
```



3) here is the evaluation with the value of 1.5 in the polynomial

```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...
Please enter the coefficient first and then power (in order) of the node you'd like to insert
3
5
Poly after insertion
Polynomial is:
5 + 2x^1 + 9x^2 + 8x^5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
2
Please enter the value you'd like to substitute
1.5
Result of substitution is 89
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
```

4)the degree of the polynomial is 5 as it shows in the screenshot below



```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...
7.Remove all nodes
8.Read from array
9.Exit
2
Please enter the value you'd like to substitute
1.5
Result of substitution is
89
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
3
Degree of the polynomial is
5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
```

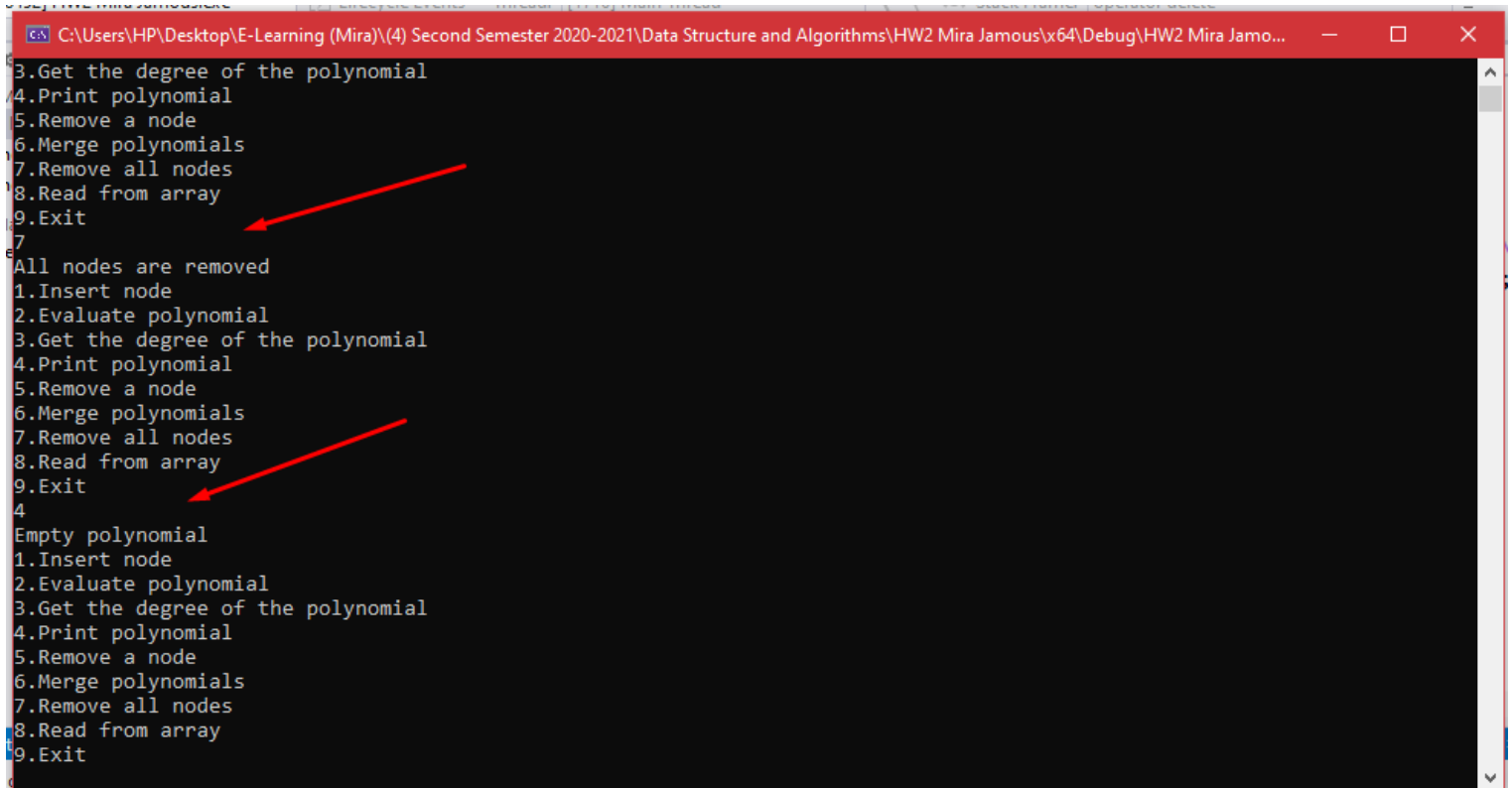
5)here's a test of the overloading of operator <<
By printing the poly to see the change after
inserting a node

```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
3
Degree of the polynomial is
5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
4
Polynomial is:
5 + 2x^1 + 9x^2 + 8x^5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
```

6) removing the node with power 5 from the polynomial

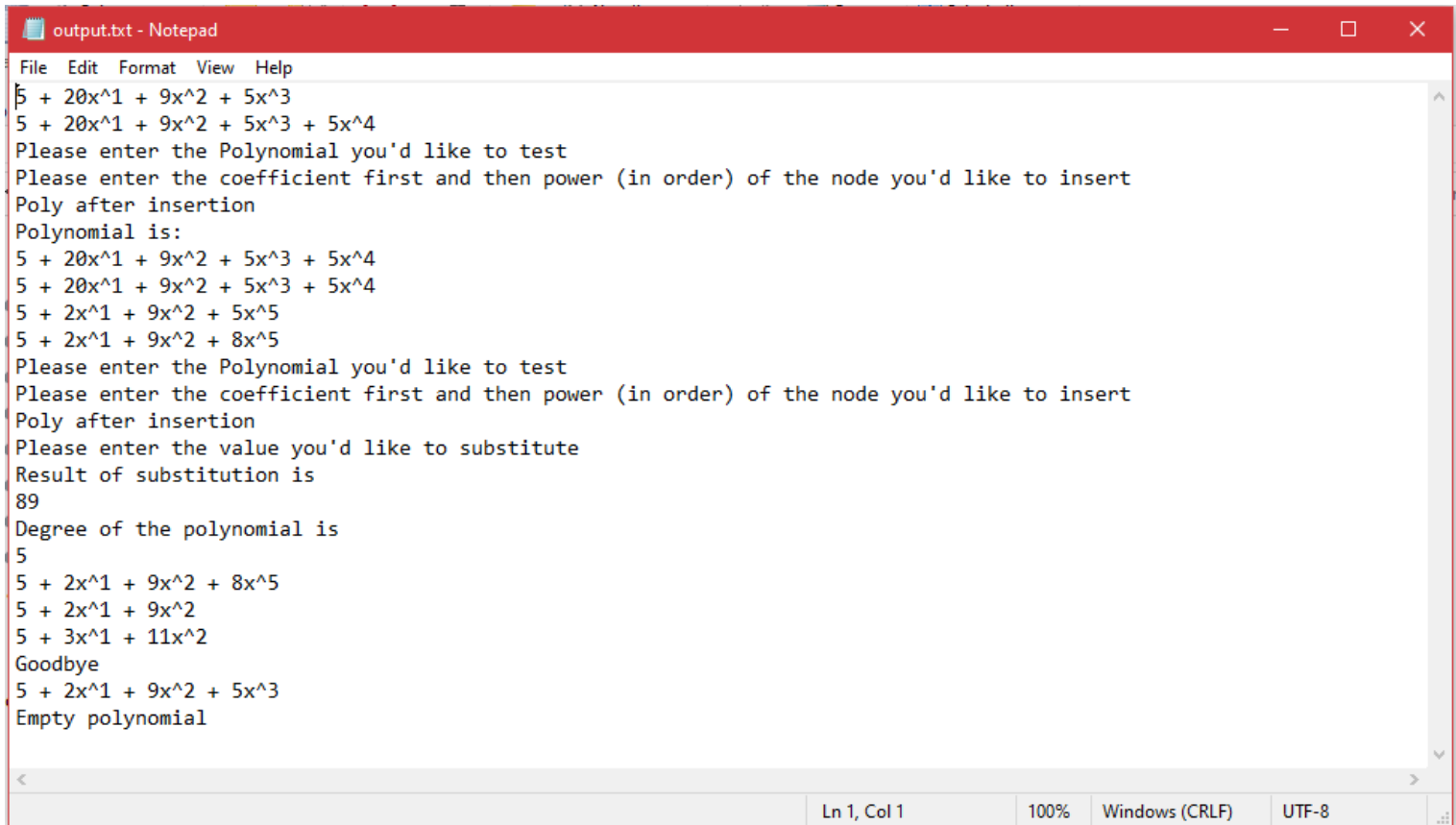
```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...
8.Read from array
9.Exit
4
Polynomial is:
5 + 2x^1 + 9x^2 + 8x^5
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
5
Please enter the power of the node you'd like to remove
5
Polynomial after deletion
Polynomial is:
5 + 2x^1 + 9x^2
1.Insert node
2.Evaluate polynomial
3.Get the degree of the polynomial
4.Print polynomial
5.Remove a node
6.Merge polynomials
7.Remove all nodes
8.Read from array
9.Exit
```

7) here I started a new program once again and entered the same poly I entered at first to test the remove all nodes function, and it shows that the poly is empty after trying to print it



```
C:\Users\HP\Desktop\E-Learning (Mira)\(4) Second Semester 2020-2021\Data Structure and Algorithms\HW2 Mira Jamous\x64\Debug\HW2 Mira Jamo...
3. Get the degree of the polynomial
4. Print polynomial
5. Remove a node
6. Merge polynomials
7. Remove all nodes
8. Read from array
9. Exit
7
All nodes are removed
1. Insert node
2. Evaluate polynomial
3. Get the degree of the polynomial
4. Print polynomial
5. Remove a node
6. Merge polynomials
7. Remove all nodes
8. Read from array
9. Exit
4
Empty polynomial
1. Insert node
2. Evaluate polynomial
3. Get the degree of the polynomial
4. Print polynomial
5. Remove a node
6. Merge polynomials
7. Remove all nodes
8. Read from array
9. Exit
```

8) Finally, here's a proof that all operations in the program are printed out to an output file (which I deleted everything on when I handed in the assignment)



```
output.txt - Notepad
File Edit Format View Help
5 + 20x^1 + 9x^2 + 5x^3
5 + 20x^1 + 9x^2 + 5x^3 + 5x^4
Please enter the Polynomial you'd like to test
Please enter the coefficient first and then power (in order) of the node you'd like to insert
Poly after insertion
Polynomial is:
5 + 20x^1 + 9x^2 + 5x^3 + 5x^4
5 + 20x^1 + 9x^2 + 5x^3 + 5x^4
5 + 2x^1 + 9x^2 + 5x^5
5 + 2x^1 + 9x^2 + 8x^5
Please enter the Polynomial you'd like to test
Please enter the coefficient first and then power (in order) of the node you'd like to insert
Poly after insertion
Please enter the value you'd like to substitute
Result of substitution is
89
Degree of the polynomial is
5
5 + 2x^1 + 9x^2 + 8x^5
5 + 2x^1 + 9x^2
5 + 3x^1 + 11x^2
Goodbye
5 + 2x^1 + 9x^2 + 5x^3
Empty polynomial
Ln 1, Col 1 100% Windows (CRLF) UTF-8
```